DAY OF THE GREAT SHOUT
An Astonishing Science-Fiction Novel
Complete In This Issue
by PHILIP JOSE FARMER
BESTER'S BEST!

Have you read his famed THE DEMOLISHED MAN? Lived in its vividly real telepathic society, detailed so ingeniously and dramatically that, finishing the book, you'll find it hard to believe that society doesn't exist — yet!

By special arrangement with the publisher of THE DEMOLISHED MAN, we can offer you this magnificent book for $1.00, 2/3 off the regular price, plus 25¢ for postage and handling.

$\frac{1}{3}$ OF LIST PRICE  

CASE BOUND  

$100$

Supplies are limited! Send your order in immediately!  
(Use Coupon or Separate Sheet)

GALAXY PUBLISHING CORP.  

Please rush me  

□ copies of THE DEMOLISHED MAN  

421 Hudson St. New York 14, N. Y.

THE DEMOLISHED MAN  

The Original Edition — Complete!  

Not A Low Cost Reprint — Yet Yours For Only $1.00! Plus Postage 25¢

Name__________________________________________

Address__________________________________________

City________________________________________ State________________

I Enclose_________
WORLDS OF TOMORROW is published bi-monthly by GALAXY PUBLISHING CORP. Main Offices: 421 Hudson Street, New York 14, N.Y. 50c per copy. Subscription (6 copies) $2.50 per year in the United States, Canada, Mexico, South and Central America and U.S. Possessions. Elsewhere $3.50. Application for second class entry pending at New York, N.Y., and at additional mailing offices. Copyright New York 1964, by Galaxy Publishing Corp. Robert M. Guinn, President. All rights, including translations reserved. All material submitted must be accompanied by self-addressed stamped envelopes. The publisher assumes no responsibility for unsolicited material. All stories in this magazine are fiction, and any similarity between characters and actual persons is coincidental. Printed in the U.S.A. by The Guinn Co., Inc., N.Y. Title Reg. U.S. Pat. Off.
GOD, GOLEM AND TOMORROW

Two remarkable men, both of whom died within the past year, have left us two remarkable books. It is no discourtesy to say that the vision and flexibility of thought displayed in these books are worthy of a first-rate science-fiction writer. They attempt a large task: in some way to reconcile the studies of metaphysics and theology, on the one hand, with the hard sciences of genetics and cybernation, on the other.

If it can be said that science is the knowledge of what is true, and religion is the knowledge of what is right, then there should be some larger context of knowledge in which both disciplines are subsumed. And if there is, it is hard to imagine two persons more capable of discovering a framework for this larger context than these two.

The first of them is that legend-in-his-own-time, an ex-child-prodigy, founder of the science of cybernetics, Norbert Wiener — who incidentally not only thought like a science-fiction writer but on occasion was one — and his book is called God & Golem, Inc. (The M. I. T. Press)

Wiener's credentials in philosophy were come by in courses conducted by Royce and Santayana. In mathematics his teachers were Bertrand Russell and G. H. Hardy. Yet Wiener was eternally his own man. What he has to say fills only a small book — 93 pages — yet it is curiously hard to sum up. He proceeds from a discussion of learning machines, especially A. L. Samuel's checker-playing computer, through self-replicating machines, into an analogy of the machine with Aladdin's lamp and W. W. Jacobs' The Monkey's Paw. The computer is a genie, says Wiener. It will do what it is asked to do, but it will not go beyond its instructions: "If you ask for 200 pounds, and do not express the condition that you do not wish it at the cost of the life of your son, 200 pounds you will get, whether your son lives or dies."

The other writer, Father Pierre Teilhard de Chardin, is almost equally a legend, though perhaps one less known to the general public. (There is ground for thinking that Morris West's novel, The Shoes of the Fisherman, was in part based on his life.) Geologist, anthropologist and Jesuit priest, Father Teilhard in this book, The Future of Man (Harper & Row), devoted the considerable power of a first-class intelligence over a long life to reconciling the inarguable evidence of the rocks with what was to him the equally inarguable certainty of the revealed Word of God.

To the conventionally accepted strata which make up our world, from core to thin outer ionosphere,
Secrets entrusted to a few

The Unpublished Facts of Life

THERE are some things that cannot be generally told—things you ought to know. Great truths are dangerous to some—but factors for personal power and accomplishment in the hands of those who understand them. Behind the tales of the miracles and mysteries of the ancients, lie centuries of their secret probing into nature's laws—their amazing discoveries of the hidden processes of man's mind, and the mastery of life's problems. Once shrouded in mystery to avoid their destruction by mass fear and ignorance, these facts remain a useful heritage for the thousands of men and women who privately use them in their homes today.

THIS FREE BOOK
The Rosicrucians (not a religious organization) an age-old brotherhood of learning, have preserved this secret wisdom in their archives for centuries. They now invite you to share the practical helpfulness of their teachings. Write today for a free copy of the book, "The Mastery of Life." Within its pages may lie a new life of opportunity for you. Address: Scribe N.X.Q.

SEND THIS COUPON
Scribe N.X.Q.
The ROSICRUCIANS (AMORC)
San Jose, California

Please send me the free book, The Mastery of Life, which explains how I may learn to use my faculties and powers of mind.

Name_________________________
Address_______________________
City___________________________

The Rosicrucians (AMORC) SAN JOSE, CALIFORNIA, U.S.A.
Father Teilhard adds a new zone. His name for it is “the Noosphere”; its place in the order, between the biosphere that makes up all life and the air itself; its definition, “the terrestrial sphere of thinking substance.” It is in the Noosphere, says Father Teilhard, that the work of thought — soul — spirit goes on; it is in the formation of the Noosphere that Mankind has made its principal contribution to the world we live on, and it is through the Noosphere that man will go on to something greater.

What is the “something greater?” It is not a mere extension of Darwin’s natural selection, says the writer; “the power of invention . . . begins to grasp the evolutionary reins.” For Man has surpassed the laws of Darwin. “Closely related though he is to the other major primates, among which he is biologically only one of a family, Man is psychically distinguished from all other animals by the entirely new fact that he not only knows, but knows that he knows. In him, for the first time on earth, consciousness has coiled back upon itself to become thought.” And thus Life has made a new start. Humanity is still in an embryonic state and has yet to attain the “ultra-human”: “a sudden blaze of brilliance, an explosion in which Thought, carried to the extreme, is volatilized upon itself.” But it is on the way.

Professor Wiener’s book is cautionary but hopeful; Father Teilhard de Chardin’s is confident — but cautionary. What they are both saying is that in some degree Man has become like a god, and the environment which will mold his future is now the environment he has created for himself.

Science does not merely discover new laws. It repeals old ones. The laws of Malthus and Marx are now off the books; the laws of Mendel and Darwin may soon follow them. Man has transcended his physical surroundings . . . and next he may transcend himself.

And what about the cautionary content of these books?

Both Wiener and Father Teilhard speak against the danger of relying on the crutch of the Machine. “I should very much hate to ride on the first trial of an automobile regulated by photoelectric feedback devices,” says Wiener, “unless there were somewhere a handle by which I could take over control if I found myself driving smack into a tree.”

Relying on thinking machines — even learning machines — to do our thinking for us is surely a risky business. Yet we may be able to cope, after all.

When A. L. Samuel set his learning machine to playing checkers, it turned out there were two learning machines in the game. The other was Samuel himself.

Both Samuel and machine started out as poor players, and at first the machine trounced the scientist with ease. But the scientist learned too, and now when Samuel and computer sit down to play it is Samuel who wins. For he learned faster — and he learned more.

— THE EDITOR
DAY OF THE GREAT SHOUT

by PHILIP JOSE FARMER

Illustrated by FINLAY

They were reborn on a fairer planet — to a new life, and a puzzle that shook the worlds!

I

He died. He knew that he faced certain oblivion.
But then his eyes opened, and he knew from the strong beat of his heart and the power of his muscles that he was no longer dying.
It was so quiet that he could hear the blood moving in his head. The silence sung. He could hear, and he could see, yet he did not know what he was seeing. What were these things above him? Where was he?
He tried to sit up, felt panic as he realized that there was nothing to sit up upon, and was propelled slowly forward by the motion. Ahead, a foot from his fingertips, was a thin rod of bright red metal. He flung his hand out to
grasp it, but something invisible was resisting him. It did not push heavily against him, but he had a feeling that some force was blocking him, something as unseen yet present as a heavy wind. Yet the only sensation of moving air came from that caused by his turning body.

He went over slowly in a somersault. Then the resistance brought him to a halt, and he straightened his body out.

At the same time, he sucked in air with a great sawing sound. Though he knew no hold existed he could not help flailing his arms about for one.

Now, he was face “down” — or was it “up”? Whatever the direction, it was opposite to that towards which he had been looking when he had awakened. Not that it mattered. “Above” him and “below” him, the view was the same. And so was his situation.

He was suspended in space and kept from falling by the force that enclosed him in an invisible cocoon. Six feet below him was the body of a woman, a naked young woman with a completely hairless head. She seemed to be asleep; her eyes were closed, and her breasts rose and fell gently. As he was, so she, too. Her body was stretched out as if in a coffin. Her legs were together and straight out and her arms by her sides. As he watched, she turned slowly, revolved as a chicken on a spit.

He became aware that the same force was also rotating him. There was no pressure he could feel, but whatever was buoying him up was also exerting energy to turn him on a spit.

Until now, he had been too stunned to utter a word or to scream. Now what he saw as he described a circle frightened him beyond speech or cry. He who had boasted that he knew no fear was stricken with horror.

At first the objects and the patterns they formed had meant nothing because the entire environment was too alien. After a few seconds something snapped. He could almost hear it, as if a window had suddenly been raised.

Above him, below him, on both sides, as far as he could see in the light — which seemed to be of equal intensity everywhere — bodies floated. They were arranged in vertical and horizontal rows both, and the up-and-down ranks were separated by the red rods, slender as broomsticks, which were a foot or so from both the heads and feet of the bodies. The rows across were divided by a space of about six feet.

The rods rose from an abyss and soared upward beyond the range of his vision. Between them stretched the revolving sleepers. And that grayness into which the bodies and the rods above and below and left and right disappeared was neither the sky nor the earth. There was no horizon, only the lackluster of infinity.

Directly above him, at a distance of six feet, was a dark man with Tuscan features. The body next to him on his right was that of a Negress, her head hairless as all the
others. At his left was a large man with a very fair skin. There was something strange about him, but the waker could not determine what it was until the third revolution.

Then he saw that the right arm, from a point just below the elbow, was red. Perhaps it lacked the outer layer of skin.

A few seconds later, he saw another body, in a row ten people across from him and four up, that lacked a head. Rather, a pink-red lump was on the end of its neck.

He continued turning and observing until he understood that he was in some place, perhaps the most colossal chamber imaginable, in which metal rods must be radiating some force that somehow supported and revolved perhaps millions or more of human beings.

Where was he?

Certainly he was not in the city of Trieste of the Austro-Hungarian Empire of 1890. Just as certainly, he was not on Earth.

He had died. Now he was alive in an afterlife, an event at which he had scoffed. For once, there was no denying that he had been wrong. But neither was there anyone present who seemed inclined to say, "I told you so, you damned infidel!"

Once again, as if this place were to be a continual parade of amusements, he saw something that made him draw in a deep breath. He had seen a body at an angle downwards (or upwards). It was nonhuman. No member of Homo Sapiens had four fingers on each hand and four toes on each foot. Nor a nose with thin black leathery lips like a dog's. Nor a scrotum knobbed as if it contained many small testes. Nor ears with such strange convolutions.

But all the other bodies, as far as he could see, were quite human.

And all were sleeping. He alone was conscious.

Very well. He would take advantage of that fact. He must get away and to a place where somebody might have the knowledge he needed.

To decide was to act.

He drew up his legs and kicked and found that the motion drove him forward a half-inch. Again, he kicked and moved against the resistance. But, as he paused, he was slowly moved back towards his original position.

In a flurry of action, kicking his legs and moving his arms in a swimmer's breastroke, he managed to fight towards the rod before him. The closer he came, the stronger became the web of force. Shortly, he was panting, and his arms and legs began to feel heavy. But he did not stop because he knew that giving up would result in being back where he had been and with less strength. Moreover, it was not his nature to give up until absolute exhaustion seized him.

Thus, when he was breathing hoarsely, his body coated with sweat, his arms and legs moving as if in a thick jelly, and his progress seemed imperceptible, the fingertips of his left hand lightly touched the rod.

At once, he knew which way was down. He fell.
It was as if his touch had broken a spell or broken an electrical circuit. The webs of air around him snapped soundlessly, and he was plunging.

But he was close enough for him to seize the rod with one hand, though the skin of his palm burned, and so bring his body down against the rod with an impact that threatened to break his pelvic bone. He grunted with pain. Then his other hand had clutched the rod, and his legs were twined about it.

In front of him, on the other side of the rod, the bodies were falling. They descended with the normal velocity of a falling object on Earth, and they maintained their stretched-out attitudes and the original distance between them. They even continued the same rate of revolving; they turned over and over, slowly.

It was then that the puffs of air on his naked sweating back made him twist around on the rod. Behind him, in the row of vertically arranged bodies that he had just occupied, the sleepers were also falling. One after the other, like statues methodically dropped through a trapdoor, they hurtled. Their feet missed his head by a few inches; he was fortunate not to have been knocked off the rod and sent plunging with them.

One after the other, in stately but frightening procession, they fell. Body after body shooting down while, on either sides, the other rows of millions upon millions slept on.

For a while, he stared. Then he began counting those on his left until he had reached 3001. After that, he quit and gazed as the cataract of flesh continued. How far up, how immeasurably far up, were they stacked? He looked down. To the limits of his sight, they were still falling. And he, unwittingly, had precipitated them when his touch had disrupted some force emanating from the rod.

His head jerked upright, and he forgot about the fallers. Another noise than the whoosh of displaced air had reached him. Somewhere overhead, a humming noise had started.

For a minute he could not locate the source of the noise. Then he saw a narrow craft, shaped like a canoe but of some bright green metallic substance, sinking down between the six feet of space between the columns of fallers and the columns of suspended. A face peered over the edge. The craft stopped, and the humming noise ceased.

Another face appeared beside the first. It, like the other, had dark hair, in contrast with all the shaven heads around it. However, the owners of the faces were too far away for the man on the rod to discern any individuality of feature. They were archetypes of faces: thin lines for eyebrows, holes for eyes, angles for noses, slits for lips.

Presently, the heads withdrew. The humming was renewed, and the craft again descended towards him. Slowly it grew larger until, about five feet above him, it halted once more. One of the occupants
spoke in a liquid language with many vowels, few consonants, and a distinct and frequently recurring glottal stop. It sounded like a Polynesian tongue.

Abruptly the invisible cocoon was replaced. The falling bodies visibly slowed in their rate of descent, then stopped. And the man on the rod could feel the retaining force close in on him and begin to lift him up. Though he clung to the rod, his legs were finally forced up and then away and his trunk followed.

Sooner he was looking downward. Then his hands were torn loose, and he began to drift upward.

Somehow he managed to twist around so that he could face the two in the flying machine. They were not going to capture him as they would a sheep.

But a bare arm and a bejewelled hand were thrust forth from the craft, and in the hand was a pencil-sized metal object. Obviously, it was a weapon of some sort, for the possessor was sighting along it.

The floater shouted with rage and hate and frustration and flailed his arms to swim towards the two in the machine.

"I'll kill!" he screamed. "Kill! Kill!"

Oblivion came again.

God was standing over him and looking down at him as he lay on the grass by the waters. He lay wide-eyed as a new-born baby weak with the shock of birth. God was poking him in the ribs with the end of an iron cane. God was a tall man of middle age. He had a long black forked beard, and He was dressed in the clothes an English gentleman wore during the 53rd year of Queen Victoria's reign.

"You're late," said God. "Long past due for the payment of your debt, you know."

"What debt?" said Richard Francis Burton. He passed his fingertips over his ribs to make sure that none had been removed.

"You owe for the flesh," replied God, poking him again with the cane. "Not to mention the spirit, both of which are one and the same thing."

Burton struggled to get up and onto his feet. Nobody, not even God, was going to punch Richard Burton and get away without a battle.

God, ignoring the futile efforts, pulled a large gold watch from His vest pocket, unsnapped its cover, looked at the hands and said, "Long past due."

God held out His other hand, its palm turned up.

"Pay up, sir. Otherwise, I'll be forced to foreclose."

"Foreclose on what?" said Burton.

Darkness fell, and God began to dissolve into the darkness. It was then that Burton saw that God resembled himself. Burton. He had the same black hair, the same Arabic-seeming face with the dark stabbing eyes, high cheekbones, heavy lips, and thrust-out deeply cleft chin. The same long deep scar, testimony to the wound inflicted by a Somali spearman in that fight at Berberah, was on His left cheek. His small hands and feet contrasted
strangely with His broad shoulders and massive chest. And He had the long thick moustachioes and the long forked beard that had caused the Bedouin to name Burton the “Father of Moustaches.”

“You look like the devil,” said Burton, but God had dissolved into the shadows.

II

Burton became aware that he had been dreaming. He was still sleeping but coming up fast from the depths, so close to the surface of the consciousness that he knew he was dreaming. Light was replacing the night; he could see it not too far away above him.

Then his eyes did open. And he did not know where he was.

Above was blue sky. A gentle breeze flowed over his body. Beneath him was what felt like grass; his hands, palms down, could feel the blades.

He was so amazed that he could not move, could not think clearly. He turned his head slightly to the right and saw a plain of very short, very green grass. Beyond, a range of hills that started out as mere slopes, then became steeper and higher as they climbed towards titanic mountains beyond. The hills were covered with trees; the mountains were bluish-green, as if overgrown with a lichen.

Burton turned his head to the left and glimpsed a broad river close by. On the other side was another plain, then hills, then the same incredibly towering mountains.

But he did not linger on them. Between him and the river, which was perhaps two hundred yards away, were many bodies. These were men and women, all of them naked.

Burton rose on one elbow. All along the river’s edge were unclothed human beings, spaced about six feet apart. Some were still lying on their backs and gazing into the sky. Others were beginning to stir, to look around.

All had bald heads; it was this that sent his own hands to his own naked skull. He ran his hands over his face.

It, too, was smooth.

Burton looked down at his body. It was not the wrinkled, veined, and withered body of the 69-year old he knew but was as smooth and powerfully muscled as when he had been 25.

And the hundred-or-so scars were gone.

Around his wrist was a thin band of some transparent material. It was connected to a strap, about six inches long, of the same stuff. The other end was clenched about a metallic handle like that of a pail’s. The handle, in turn, was fixed to a grayish metal cylinder with a closed cover.

Burton lifted the cylinder; it could not have weighed more than a pound. Certainly it was not steel, for it had a diameter of about a foot and a half and was somewhat over two and a half feet tall.

Every one within his sight had a similar object strapped to his or her wrist.
Unsteadily, his heart racing with an unfamiliar terror, he rose to his feet. He was beginning to know now what had happened.

Others must have felt as he did, for he could see stark fear on their faces.

Nobody had uttered a word; not one of the thousands he could see had made a sound, though the mouths of many hung open.

They began moving about a little. They shuffled their bare feet way, halted, turned, moved the other way. They did not know where to go.

Suddenly, a woman began moaning. She sank to her knees, threw her shoulders and her head back, and she howled. At the same time, from far down the riverbanks, came a similar howling.

It was as if the woman had given a signal. Or as if she were the key to the mass reaction, and she had turned and unlocked it.

All, or almost all, began screaming or sobbing or tearing at their faces with their nails or beating themselves on the breasts or falling on their knees and lifting their hands in prayer or throwing themselves down and trying to bury their faces in the grass as if, ostrich-like, to avoid being seen, or rolling back and forth in frenzy, barking like dogs or howling like wolves.

Burton felt the collective psyche of humanity trying to seize him, to draw him, too, into panic and hysteria. He wanted to go to his knees and pray for salvation from judgement, for mercy. He did not want to see the blinding face of God appear over the mountains. Like all the rest, he knew suddenly that he was not as brave and not as guiltless as he had thought. Judgment would be a thing so terrifying that he could not bear to think about it.

So he did what he had never done in his life on Earth. He fled. He ran across the plains and towards the foothills. Nor could he keep from venting his terror as he ran; he howled: “No! No! No!” His arms windmilled as if he would fend off unseen terrors; the metallic cylinder at the end of the strap around his wrist whirled around and around.

When he had run as fast as he could across the mile of plain, when he was panting for breath so deeply that he could no longer howl and his legs and arms felt as if hung with weights and his lungs burned and his heart boomed, he threw himself on the ground underneath the first of the trees.

Presently he saw a figure come across the plain toward him. As it got closer, he saw that it was not human.

It was then that Burton was sure that this Resurrection Day was not that which the religion he knew had told him it would be. Burton had not believed in the God portrayed by the Christians, Moslems, or Hindus; in fact, he was not sure that he believed in any Creator whatsoever. He had believed in Richard Francis Burton and a few friends, and he was sure that when he died the world, for him, would cease to exist forever.

Now, seeing the alien approach,
he was sure that there was some physical, scientific, reason for his being here; he did not have to resort to Judaeo-Christian-Moslem myths for cause.

The creature — it must be a male — was a biped about 6 feet 8 inches tall. His pink-skinned body was very thin; it had four fingers on each hand and four very long and thin toes on each foot. There were two dark red spots below the male nipples on the chest. The face was semi-human. Thick black eyebrows swept down to the protruding cheekbones and flared out to cover them with a soft brown down. The sides of his nostrils were fringed with a thin membrane about a sixteenth of an inch long. The thick pad of cartilage on the end of his nose was deeply cleft. The lips were thin, leathery, and black. The ears were lobeless and the convolutions within were nonhuman.

This was the creature he had seen in the tank when he had dreamed his first dream.

*Dream? That had been no dream.*

Burton rose as the creature approached. He looked around for a stick or a club with which to defend himself if it should be aggressive. He saw none. The tree under which he stood was towering, similar to a huge Norway pine. Near it was a tree of a type he had never seen; this had a thick gnarled trunk with a blackish bark and many thick branches bearing huge green leaves with scarlet lacings.

The creature smiled and revealed quite human teeth. He said, "I hope you speak English. However, I can speak with some fluency in Russian or Chinese."

"You speak English quite well — Midwestern American English," said Burton.

"Thank you," said the creature. "I followed you because you seemed the only person who might be able to talk coherently. Perhaps you have some explanation for this . . . what do you call it? . . . resurrection?"

"No more than you," said Burton. "In fact, I don't have any explanation for you."

The cleft nose of the alien twitched, a gesture which Burton was to find indicated surprise or puzzlement. "No? That is strange. I would have sworn that not one of the 6 billion of Earth's inhabitants had not heard of or seen me on the TV."

"TV?"

The creature's nose twitched again. "You don't know what TV . . ." His voice trailed, then he smiled again. "Of course, how stupid of me! You must have died before I came to Earth!"

"When was that?"

The alien's eyebrows rose (equivalent to a human frown), and he said, slowly, "Let's see. I believe it was, in your chronology, 2002 A.D. When did you die?"

"It must have been in 1890 A.D.," said Burton. He still felt a sense of unreality, of being detached from all that was taking place around him. He ran his tongue around his mouth; the teeth he had lost when the Somali spear ran
through his cheek were now replaced. But he was still circumcised. "At least," he added, "I remember nothing after October 20th, 1890."

"Aaah!" said the creature. "So, I left my native planet approximately 200 years before you died. My planet? The second revolving around what you Terrestrials call Tau Ceti. I was on the first interstellar expedition. We placed ourselves in suspended animation, and when our ship approached your sun we were automatically thawed out, and... but you do not know what I am talking about?"

"Not quite. Things are happening too fast, in too alien an environment. Later, I would like to get details. What is your name?"

"Monat Grautuft. Yours?"

"Richard Francis Burton at your service." He bowed slightly and smiled. Despite the strangeness of the creature and some repulsive physical aspects, Burton found himself warming to him. "The late Captain Sir Richard Francis Burton," he added. "Most recently Her Majesty's Consul in the Austro-Hungarian port of Trieste."

"Elizabeth?"

"I lived in the nineteenth, century, not the sixteenth," said Burton.

"There was an English Queen Elizabeth who reigned in the twentieth," said Monat. He turned to look towards the riverbank. "Why are they so afraid? All the human beings I met were either sure that there would be no afterlife or else that they would get preferential treatment in the hereafter."

Burton grinned and said, "Those who denied the hereafter are sure they're in Hell because of their blasphemy. As for those who knew they would go to Heaven, they're shocked, I would imagine, to find themselves naked. You see, most of the illustrations of our afterlife show those in Hell as naked and those in Heaven as being clothed."

"You seem amused," said Monat. "What do you think?"

"I wasn't so amused a few minutes ago," said Burton. "But I think there's an explanation for this. And it won't match any of the conjectures I knew on Earth."

"I doubt we're on Earth," said Monat. He pointed upwards with long slim fingers which bore thick cartilage pads instead of nails, and he said, "If you look steadily there, with your eyes shielded, you can see another bright body which seemed to be a quarter of the size of a full moon."

When he put his hands down, he said, "I wonder what purpose this cylinder has?"

Monat unsnapped the strap attached to his wrist and placed the cylinder on the ground. He raised the lid and looked within. Burton followed his example. Inside the hollow cylinder were six snapdown rings of metal. These held various deep cups and pots. All the containers were empty.

Monat closed the cover and said, "Doubtless we'll find out their function in due course."

By then, others were leaving the riverbank and walking towards
them. One of the men at once attracted Burton. Where Monat was obviously nonhuman, this fellow was subhuman or prehuman. He was very short and broad and walked with his head thrust forward. The forehead was very low and slanting; the skull was shaped like a loaf of bread, long and narrow. Enormous supraorbital ridges shadowed dark brown eyes. The nose was a smear of flesh with huge nostrils, and the bulging bones beneath his lips pushed them out to give a pseudo-Negro appearance. The lips themselves were very thin.

His chest was huge and was matted with long dark hair. Hair lay in thick whorls over his shoulders and down his back and over the fronts of his bowed legs.

He stood a little apart from the others and looked questioningly at them. The human beings drew away from him as if afraid. Then, a man behind him spoke in English to him. The subhuman turned and answered back in a language Burton did not recognize, but he seemed grateful for the recognition. He pointed to himself and said something that sounded like Kazzintuitruuaabemss. This could have been his name or it could have meant anything. Later, Burton found out that it was his name and meant Man-Who-Slew-The-White-Long-Tooth.

Burton called to the man who had spoken to the subhuman. "You two come here, if you please! We might as well get acquainted. We've got nothing else at the moment to do."

He took one step forward.

The youth, looking out of the corners of his eyes at Monat, came up to Burton and extended his hand. "Name's Peter Frigate," he said. "F-r-i-g-a-t-e. Glad to make your acquaintance on mankind's most momentous day. Born under the Sign of Aquarius, during the last year of the Great War of 1914-1918 in Terre Haute, Indiana, U.S.A. Spent a misspent life as a writer and scholar of sorts. Died in 2008 through the devices of this Tau Cetan. But I don't hold it against him. He was only defending himself."

Frigate spoke bravely enough but with a strained voice, as if he were trying to keep a tight control on himself. He was about Burton's height, almost six feet, muscular, and weighed about one hundred and seventy-five pounds. His face was craggy, the kind with which a caricaturist would have a field day. His eyes were hazel.

"Burton here. You sound as if you'd met Monat Gr'rautuft."

"Not exactly," said Frigate. "I saw him enough on TV, though."

Hesitantly, he held out his hand to the alien. Monat smiled, and they shook.

Frigate said, "I think it'll be a good idea if we band together. We may need protection later on."

"Why?" said Burton.

"You know how rotten most human beings are," said Frigate. "Once people get used to being resurrected, they'll be fighting for women and food or anything that takes their fancy. And I think we ought to be buddies with this... Neander-
that? No, he looks more like a reconstruction of an Australopithecus, or something similar. Anyway, he'll be a good man in a fight. Besides, you wouldn't want to pass up the chance to talk to a real live pre-human, would you? I was something of a linguist; think of the sheer joy of analyzing a pre-human language."

Kazz, as the others came to call him, seemed pathetically eager to be accepted. But he kept watching the others that went by as if he were looking for one of his own species.

A woman walked by muttering over and over in German, "My God! My God! What have I done to offend Thee?"

A man had both his fists clenched and raised to shoulder height, and he was shouting in Yiddish, "My beard! My beard!"

A woman making a pathetic attempt to cover herself with her hands hurried by. She was muttering, "What will they think, what will they think?" And she disappeared behind the trees.

A man and a woman passed them; these were talking loudly in Italian as if they were separated by a broad highway and not by several feet. "We can't be in Heaven. I know, oh my God, I know! There was Giuseppe Zomzini and you know what a wicked man he is... he ought to burn in hellfire! I know, I know... he stole from the treasury, he frequented bad houses, he drank himself to death... yet he's here! I know, I know..."

Another woman was running and screaming in German, "Daddy! Where are you? It's your own darling Hilda!"

A man scowled at them and said repeatedly, "—them. I'm as good as anyone and better than some."

A woman said, "I wasted my whole life, my whole life. I did everything for them, and...now..."

A man, swinging the metal cylinder before him as if it were a censer, called out, "Follow me to the mountains! Follow me! I know the truth, good people! Follow me! We'll be safe in the bosom of the Lord! Don't believe what you see now; follow me!"

Others spoke gibberish or were silent, their lips tight as if they feared to utter what was within them. "It'll take some time before they straighten out," said Burton.

"They may never know the truth," said Frigate.

"What do you mean?" said Burton.

"They didn't know it on Earth, so why should they here? What makes you think we're going to get a revelation?"

Burton shrugged and said, "I don't. But I do think that we ought to determine just what our environment is and now we can survive in it. The fortune of a man who sits, sits also." He pointed towards the riverbank. "See those? Those large stone structures shaped like low flat-topped toadstools? They seem to be spaced out at intervals of a mile. What is their purpose?"

Monat said, "If you had taken a close look at them as I did, you would have seen that the flat surface of each bears round indenta-
tions. These are just the right size for the base of one of these cylinders to fit in. In fact, they must be for that purpose. One of these cylinders sits in the center of the top surface. I think that if we examine that cylinder, we may be able to determine their purpose.”

III

A woman approached them. She was of medium height, had a superb shape, and a face that would have been beautiful if it had been framed by hair. Her eyes were dark.

She said in a well-modulated voice, “I beg your pardon, gentlemen. I couldn’t help overhearing you speak in English. I am an Englishwoman; I’m looking for some countrymen, some gentlemen whom I can trust to give me companionship and protection in the midst of these foreigners. I throw myself on your mercy.”

“Fortunately for you, Madame,” said Burton, “you have come to the right men.”

“By all means,” said Frigate, “let’s preserve the English proprieties. Your name?”

“Alice Pleasance Hargreaves.”

Frigate’s eyes opened wide, and he looked as if he were going to speak. But he closed his mouth. Burton introduced himself and the others. She took the hand of Monat without flinching, but she merely nodded at the subhuman. Frigate explained to her a little about Monat. Alice made no comment; perhaps she was too amazed to say anything intelligently on the subject.

“The sun’s climbing high over the mountains,” said Burton. “I’m getting thirsty. Let’s go down to the river and drink.”

They walked back across the plain. The men and women and the few children there, none under five years of age, were sitting on the grass or milling aimlessly around. A couple was arguing loudly and red-facedly. Apparently, they had been husband and wife and were continuing what must have been a lifelong dispute. Suddenly, the man turned and walked away. The wife looked unbelievingly at him, then ran after him. He thrust her away so violently that she fell on the grass. He ran away and quickly lost himself in the crowd.

Burton thought briefly of his own wife and wondered where she was. He did not have to guess what she was doing; she would be looking for him. Nor would she stop looking until she found him.


“I wish I could forget it,” said Frigate.

Refreshed, they climbed upon the top of the nearest “toadstool” structure. It was composed of a dense-grained gray stone flecked heavily with reddish iron-looking mineral. On its flat surface were six hundred indentations spaced concentrically. The hole in the center held one of the metal cylinders. Examin-
ing it was a little dark-skinned man
with a big nose and receding chin.
As they approached, he looked up
and smiled. “This one won’t open,”
he said in German. “Perhaps it will
later. I’m sure it’s there as an ex-
ample of what to do with our own
containers.”

He introduced himself as Lev
Ruach and switched to a heavily
accented English when Burton, Fri-
gate, and Hargreaves gave their
names.

“I was an atheist,” he said. “Now,
I don’t know. This place is as big
a shock to an atheist, you know,
as to those devout believers who
had pictured an afterlife quite dif-
ferent from this. Well, so I was
wrong. It wouldn’t be the first time.”
He chuckled, and he said to Monat,
“I recognized you at once. It’s a
good thing for you that you were
resurrected in a group mainly con-
sisting of people who died in the
19th century. Otherwise, you’d be
lynched.”

“Why is that?” asked Burton.
“He killed Earth,” said Frigate.
“At least, I think he did.”

“The scanner,” said Monat dole-
fully, “would have killed only hu-
man beings. It was adjusted to put
an end only to those of a certain
intelligence level. And it would not
have exterminated all of mankind.
It would have ceased operating af-
ther a predetermined number — un-
fortunately, a large number — had
lost their lives. Believe me, my
friends, I did not want to do that.
You do not know what an agony
it cost me to make the decision to
press the button. But I had to pro-
tect my people. Yours forced my
hand.”

It started when Monat was on
a live show,” said Frigate.
“Monat made an unfortunate re-
mark. He said that his scientists
had the knowledge and ability to
keep people from getting old.
Theoretically, using Tau Cetan
techniques, a man could live forever.
But, on his planet, the knowledge
was not used; it was forbidden. The
interviewer asked him if these tech-
iques could be applied to Terres-
trials. Monat replied that there was
no reason why not. But rejuvena-
tion was denied to his own kind for
a very good reason, and this also
applied to Terrestrials. Then the
government censor realized what
was happening and cut off the au-
dio, but it was too late.”

“Later,” said Lev Ruach, “the
American government tried to deny
that Monat had said what he said.
It reported that Monat had mis-
understood the question, that his
knowledge of English had led him
to make a misstatement. But it was
too late. The people of America,
of the world, demanded that Monat
reveal the secret of eternal youth.”

“Which I did not have,” said
Monat. “Not a single one on the
expedition had the knowledge. In
fact, very few people on my planet
had it. But it did no good to tell
the people this. They thought I was
lying. There was a riot, and a mob
stormed the guards around our ship
and broke into it. I saw my friends
torn to pieces while they tried to
reason with the mob. Reason!
"But I did what I did, not for re-
venge but for a very different rea-
son. I knew that, after we were 
killed, or even if we weren't, the 
government would restore order. 
And it would have the ship in its 
possession. It wouldn't be long be-
fore Terrestrial scientists would 
know how to duplicate it. Inevi-
itably, the Terrestrials would launch 
an invasion fleet against our world. 
So, to make sure that Earth would 
be set back many centuries, maybe 
thousands of years, knowing that I 
would have to do the dreadful thing to save 
my own world, I sent the signal to 
the scanner satellite. I would not 
have had to do that if I could have 
gotten to the destruct-button and 
blown the ship up. But I could not 
get to the control room. A short 
time later the mob blew off the door 
of the room in which I had taken 
refuge, and I remember nothing but 
savage blows."

"I wonder what happened to 
those who weren't killed," said 
Frigate. "I was in a hospital in 
Western Samoa at that time, dying 
of cancer and wondering if I would 
be buried next to Robert Louis Stev-
enson. Not much chance, I was 
thinking. Still, I had translated the 
Iliad and the Odyssey into Samoan 
... then the news came. People all 
over the world were falling dead. 
The pattern of fatality was obvious; 
the Tau Cetan satellite was radiat-
ing something that dropped human 
beings in their tracks. The last I 
heard was that the U.S., England, 
Russia, China, France, and Israel 
were all sending up rockets to inter-
cept it, blow it up. And the carrier 
of death was on a path which would 
take it over Samoa."

"The interceptors failed," said 
Rauch. "The scanner blew them up 
before they even got close."

Burton thought that he had a 
lot to learn about post-1890, but not 
was not the time to talk about it, 
suggest we go up into the hills," he 
said. "We should learn what type of 
vegetation grows there and if it can 
be useful. Also, if there is any flint 
we can work into weapons. This 
flint Kazz must be familiar with 
stone-working." He started walking 
slowly across the plain.

The others seemed willing to let 
him lead. He walked across the mile-
broad plain and into the hills. On 
the way, several others joined their 
group. One was a little girl of about 
seven years old. She looked pathet-
ically at Burton as he approached, 
and Frigate, who knew a little Welsh 
and Gaelic, spoke to her. Her eyes 
widened, then she frowned. Obvious-
ly, the words seemed to have a cer-
tain familiarity or similarity to her 
speech. But not enough to be intel-
ligible.

"For all we know," said Frigate, 
"she could be a child of ancient 
Gaul."

"We'll teach her English," said 
Burton. He picked up the child in 
his arms and started to walk with 
her. She burst into tears, but she 
made no effort to free herself. The 
weeping was a release from what 
must have been almost unbearable 
tension and a joy at finding a 
guardian. After a while she nestled 
quietly against his shoulder."
Where the plain met the hills, as if a line had been drawn, the short grass ceased and a thick coarse esparto-like grass, waist-high, began. Here, too, the towering pines and the gnarled giants with scarlet and green leaves grew thickly. Further within the hills, clumps of bamboo appeared. These consisted of many varieties, from slender stalks only a few feet high to plants over fifty feet high and thick as a man's thigh.

"Here's the material for spear-shafts," said Burton, "pipes for conducting water, containers, the basic stuff for building houses, furniture, boats, perhaps even for making paper. And the young stalks of some may be good for eating."

They climbed on, going over hills whose height increased as they neared the mountain. After they had crossed about three miles, they were stopped by the mountain. This rose abruptly in a sheer cliff-face of some blue-black igneous rock on which grew huge patches of a blue-green lichen. There was no way of determining accurately how high it was, but Burton did not think that he was wrong in estimating it as at least 20,000 feet. Moreover, as far as they could see, it presented an unbroken front.

"Have you noticed the complete absence of animal life?" said Frigate. "Not even an insect."

Burton, instead of replying, picked up a fist-sized chunk of stone. "Chert," he said. "If there's enough in this area, we can make knives, spearheads, adzes, axes. And with them build houses, boats, many other artifacts."

"Tools and weapons must be bound to wooden shafts," said Frigate. "What do we use as binding material?"

"Perhaps human skin," said Burton.

The others looked shocked. Burton gave a strange chirruping laugh, incongruous in so masculine-looking a man. He said, "If we're forced to kill in self-defense or lucky enough to stumble over a corpse some assassin has been kind enough to prepare for us, we'd be fools not to use what we need. However, if any of you feel self-sacrificing enough to offer your own epidermis for the good of the group, step forward! We'll remember you in our wills," he laughed.

"Surely, you are jesting," Alice Hargreaves said. "I can't say I particularly care for it."

Frigate locked narrow-eyed at Burton. "What's your Christian name?"

"Richard Francis."

"You couldn't be . . . ?" said Frigate. "No, that would be too much of a coincidence, too much luck for me. Still, if you had a head of hair and a beard . . . ."

Burton did not ask him what he meant but instead suggested they return to the river. Before they left, however, Kazz managed to make himself a sharp chert knife.

IV

On top of a tall hill, they paused for a moment. The sun was at its zenith. At this point, they could see for many miles along the river.
and also across the river. Although they were too far away to make out any figures on the other side of the mile-wide stream, they could perceive the mushroom-shaped structures there. The terrain on that side was the same as that on theirs. A mile-wide plain, perhaps three miles of foothills covered with trees. Beyond, the straight-up face of an almost insurmountable bluish-green mountain.

“Sunrise must come late and sunset early in this valley,” said Burton. “Well, we must make the most of the bright hours.”

At that moment a blue flame arose from the top of each stone structure, soared up at least twenty feet, then disappeared.

As one, the party cried out. A few seconds later, a sound of distant thunder passed them. The boom struck the mountain behind them and echoed.

Burton scooped up the little girl in his arms and he began to trot down the hill. Though they maintained a good pace, they were forced to walk from time to time to regain their breaths. Nevertheless, Burton felt wonderful. It had been so many years since he could use his muscles so prodigiously that he did not want to stop enjoying the sensation. He could scarcely believe that, only a short time ago, his right foot had been swollen with gout.

They came to the plain and continued trotting, for they could see that there was much excitement around one of the structures. Burton swore at those in his way and pushed them aside. He got black looks but no one tried to push back. Abruptly, he was in the space cleared around the base. And he saw what had attracted them. He also smelled it.

Frigate, behind him, said, “Oh, my God!” and tried to retch on his empty stomach.

Burton had seen too much during his Earth life to be easily affected. Before him lay the corpse of a man; its skin was burned off, and the naked muscles were deeply charred.

“What happened?” said Burton to a woman who was uttering a prayer in Italian.

“He was leaning against the rock and complaining that he was hungry,” whispered the woman. “He was wondering if we had been brought back to life only to starve to death. Then there was a roar and blue flames shot up from the top of the rock. They didn’t seem to touch him, but he fell over dead. And burned. It was horrible, horrible.”

“A discharge of energy,” said Lev Ruach behind Burton. “Electrical?”

Burton looked closely at the top of the structure. The gray cylinder in the center seemed to be untouched. He stepped up to the rock and reached out slowly to touch it.

“Don’t do that!” said Ruach. “It may not be completely discharged. Or there may be another as strong as the first.”

“I don’t think so,” said Burton. “I think that cylinder has some connection with the blue flames, that it was attached to the rock so we could learn something from it.”

He felt the rock with his finger-
tips and found it no warmer than might have been expected from its exposure to the sun. A few cries came from the crowd, which evidently expected him to drop dead also. He smiled and vaulted onto the flat top. Nothing happened, although he had not been sure that he, too, would not be destroyed. And the top did not feel unbearably warm to his bare feet.

He walked to the cylinder and took hold of the cover. It rose.

His heart beating hard, he looked within. Somehow he had expected the miracle, and there it was.

The racks within held six containers, and each of these was full.

He signalled to his group to come up. Without hesitation they obeyed him. Frigate, looking pale but no longer heaving dully, also came.

Gesturing at the interior, Burton said, "This cylinder is a veritable grail. Look! Steak! Bread and butter! Salad! What's that? A pack of cigarettes? And a cigar!"

He closed the lid before they could all see and glanced at the crowd. Nobody had ventured to follow them yet, though some looked as if they would shortly have the nerve to do so. "When they find out there's food here," he said in a low tone, "there will be a fight. I say, let them have it. There won't be much to go around anyway. Not that I'm avoiding a battle, you understand," he said, looking fiercely at them. "But I think that this will not be the only food available. Our grails must be designed for the same purpose as this. I'm sure that later on they, too, will be filled. So let's get out of here."

He walked off with the others following. At once men and women swarmed upon the surface. Within a minute, they were fighting savagely for the contents of the cylinder. A tall burly man seized the cooked steak, jumped off the rock onto the riverside and dived into the water with the meat. Nobody followed him. He floated off on his back, paddling with one hand and holding the steak to his mouth with the other.

Burton waited until the excitement cooled and then announced, in a loud voice, what he suspected. They listened, and such was the impression of his authority, they agreed to try his experiment. Each man and woman placed his grail in a depression and noted carefully its exact location. Burton had warned them that it was very likely that only the grail attached to each person when he woke up could be opened by that person.

They waited. It was a long wait, for nobody wanted to leave the vicinity. Yet Burton could not be inactive unless under compulsion.

There was work to be done, anyway. The dead man had to be buried or gotten rid of in some manner. Burton picked up the front part of the corpse, asking Frigate to take the legs. Frigate looked very reluctant but did so, and they carried the body off across the plain. When the burden became too heavy, Monat and Kazz took over the job. Alice came behind them several yards with the child's hand in hers.
Alice had been afraid that the sight of the dead man would terrify the child, but the little girl seemed only curious.

"If she really is an ancient Gaul," said Frigate, "she may be used to seeing charred corpses. After all, if I remember correctly, the Gauls burned people in big wicker baskets at religious ceremonies. I wish I had a library to refer to. Do you think we'll ever have one here?"

"That remains to be seen," said Burton. "If we're not provided with one, we'll make our own."

He and Frigate took the body back from Monat and Kazz and continued with it.

"If every one who has ever lived has been resurrected here," said Frigate, "think of the research to be done! Think of the historical mysteries you could clear up! You could talk to John Wilkes Booth and find out if Secretary of War Stanton really was behind the Lincoln assassination. You might ferret out the identity of Jack the Ripper. Find out if Joan of Arc actually did belong to a witch cult. Talk to Napoleon's Marshal Ney; see if he did escape the firing squad and become a schoolteacher in America. Get the true story on Pearl Harbor. See the face of the Man in the Iron Mask, if there ever was such a person. Interview Lucrezia Borgia and those who knew her and determine if she was the poisoning bitch most people think she is. Learn the identity of the assassin of the two little princes in the Tower."

He continued, "And you, Richard Burton! There are many questions about your own life that your many biographers would like to have answered. Did you really have a Persian love you were going to marry and for whom you were going to renounce your true identity and become a native? Did she die before you could marry her? And did her death really embitter you, and did you carry a torch for her the rest of your life?

"And... and... well, it'll all have to wait, I can see that. But did you know that your wife had extreme unction administered to you shortly after you died and that you were buried in a Catholic cemetery? You, the infidel! And she burned your journal. Did the journal really horrify her enough to burn it?"

Lev Rauch, whose eyes had been widening while Frigate was rattling on, said, "You're Burton, the explorer and linguist? The discoverer of Lake Tanganyika? The one who made a pilgrimage to Mecca while disguised as a Moslem? The translator of the Thousand and One Nights?"

"I have no desire to lie. Nor need to. I am he."

Lev Rauch spat at Burton. The wind carried it away. "You son of a bitch!" he cried. "You foul Nazi bastard! I read about you. You were, in man ways, an admirable person, but you were an anti-Semite!"

"That's not true," said Burton. "My enemies spread that rumor. But—"

"I suppose you didn't write The Jew, The Gypsy, and El Islam?"
"I did," replied Burton, his body and face red. "And I think you had better go. A man who talks to me as you have just done has to defend his words with deeds. If you do not apologize or walk off, I am going to drop this corpse and proceed to make another."

Ruach clenched his fists and glared at Burton; then he spun around and stalked off.

"What is a Nazi?" said Burton to Frigate.

The American explained as best he could in the short time it took them to reach the hills. Burton said, "I have much to learn about what happened after I died. England, you say, became a second-class power? Only fifteen years after my death? I find that difficult to believe."

"Why would I lie to you?" said Frigate. "Don't feel bad about it. Before the end of the 20th century, she had risen again, and in a most curious way . . ."

Listening to the Yankee, Burton felt pride for his country. Although England had treated him more than shabbily during his lifetime, and although he had always wanted to get out of the island and away while residing in it, he would defend it to the death. And he had always been devoted to the Queen.

Abruptly, he said, "If you guessed my identity, why didn't you say something about it?"

"I wanted to be sure. Besides, we've not had much time for social intercourse. Or an other kind," Frigate added, looking sidewise at Alice Hargreaves' magnificent figure.

"I know something about her, too," he said, "if she's the woman I think she is."

"That's more than I do," replied Burton. He stopped, for they had gone up the gentle slope of the first hill and were on its top. They lowered the body to the ground beneath a giant pine.

Immediately, the prehuman Kazz, chert knife in hand, squatted down by the charred corpse. He raised his head upwards and uttered a few phrases in what must have been a religious chant. Then, before the others could object, he had removed the liver.


Kazz's big teeth bit into the bloody organ and tore off a large chunk. His massively muscled and thickly boned jaws began chewing, and he half-closed his eyes in ecstasy. Burton stepped up to him and held out his hand, intending to remonstrate. Kazz grinned bloodily and cut off a piece and offered it to Burton. He was very surprised at the refusal.

"A cannibal!" said Alice Hargreaves. "A bloody stinking cannibal!"

"No worse than our own ancestors," said Burton, who had recovered from the shock. "And, in a land where there seems to be precious little food, eminently practical. Well, our problem of burying a corpse without proper digging tools is solved. Furthermore, if we're wrong about the grails being a source of food, we may be emulating Kazz."
“Never!” said Alice, staring horrifiedly at the corpse and then at Burton. “I’d die first!”

“That is exactly what you would do,” replied Burton coolly. “I suggest we retire and leave him to his meal. It doesn’t do anything for my own appetite, and I find his table manners as abominable as an American frontiersman’s.”

They walked out of sight of Kazz and behind one of the great gnarled trees. Alice said, “I don’t want him around. He’s an animal, an abomination! Why, I wouldn’t feel safe for a second with him around!”

“You asked me for protection,” said Burton. “I’ll give it to you as long as you are a member of this party. But you’ll also have to accept my decisions. One of which is that the apeman remains with us. We need his strength and his skills, which seem to be very appropriate for this type of country. We’ve become primitives; therefore, we can learn from a primitive. He stays.”

Alice looked at the others with silent appeal. Monat twitched his eyebrows; Frigate shrugged his shoulders. He said, “Alice, if you can possibly do it, forget your conventions. We’re not in a proper upper-class Victorian heaven. Or, indeed, in any sort of heaven ever dreamed of. You can’t think and behave as you did on earth. For one thing, you come from a society where women covered themselves from neck to foot in heavy garments, and the sight of a woman’s knee was a stirring sexual event.

Yet you seem to suffer no embarrassment because you’re going about nude.”

Alice said, “I don’t like it, but why should I be embarrassed? Where all are nude, none are nude . . . anyway, if my figure weren’t good I might be suffering more.”

The two men laughed and Frigate said, “You’re fabulous, Alice. Absolutely.”

She did not reply but walked away until she was out of sight behind a large tree. Burton, watching the sway of hips, said, “Something will have to be done about sanitation in the near future. Which means that somebody will have to decide the health policies and have the power to make regulations and enforce them. How do we form any sort of legislative and judicial and executive bodies from the present state of anarchy?”

“To get to more immediate problems,” said Frigate, “What do we do about the dead man?”

That was solved for them, for the present, at least. On returning to the site where they had left Kazz and the corpse, they found that both were gone.

Presently the broad hairy form of Kazz reappeared. He grinned toothily at them with now clean lips. He was wiping his hands with a tangle of grass blades.

“He must have buried it some place” said Burton. “He’ll return later for snacks.” He turned to look at the sun, which was only several degrees from the top of the western mountain. “We’d better hurry back to the grailrock.”
The six walked swiftly back across the plains. At the rock, they deposited their grails in the depressions.

The sun plunged behind the towering rampart, and twilight came at once. However, the sky above them stayed bright for a long time. Then, as the color began to dull, there was a roar. Blue flames shot up from every rock in sight.

Though they had been expecting it, everybody jumped and screamed. Nor did they rush to the rock at once. They were not sure that the phenomenon would not repeat itself immediately.

Again Burton was first on the flat surface. He lifted the cover of his grail, looked within and whooped with delight. The others rushed up and seized their own cylinders.

Within a minute they were scattered over the plain or hurrying toward the hills, chattering with mingled relief and gaiety. Things were not so bad; whoever was responsible was taking care of them.

They made camp beneath the wide-flung and densely leaved branches of one of the gnarled giants which were to be called “fronthills.” In a short time a fire was built. It was not necessary to start one by working a friction stick, as they had planned. One of the items in the grails was a three-inch long slender cylinder of some hard metal or plastic. When pressed on one end, a thick growing wire slid out the other. The wire, applied to a pile of shaven bamboo splinters, started a flame swiftly.

Gasping, whooping, exclaiming, they pulled the contents of the grails out and examined them by the firelight. There was food in plenty: a tender medium-cooked cubical steak four inches thick; a small ball of dark bread; butter; potatoes and gravy; lettuce with salad dressing of unfamiliar but delicious taste. In addition, there was a five-ounce cup containing bourbon and another small cup with four ice cubes in it.

There was more, all the better because unexpected. A small briar pipe. A stack of pipe tobacco. Three panatela-shaped cigars. A plastic package with ten cigarettes.

“Unfiltered!” said Frigate. There was also one small brown cigarette which Burton said Frigate smelled and said, at the same time. “Marihuana!”

Alice, holding up a small pair of plastic scissors and a comb, said, “Evidently we’re going to get our hair back. Otherwise, there’d be no need for these. I’m so glad! but do they really expect me to use this?”

She held out a container of bright red lipstick.

“Or me?” said Frigate, also looking at a similar tube.

“They’re eminently practical,” said Monat, turning over a packet of what was obviously toilet paper. Then he pulled out a sphere of green soap.

Burton was so hungry that he had forgotten his manners and had not waited until Alice had started. He did not think it mattered, not here. The steak was very tender, although he would have preferred it.
rare. On the other hand, Frigate complained because it was not cooked enough.

Evidently these grails are not tailored for the individual owner,” he said. “That’s why we men got lipstick and Alice a pipe. It’s mass production.”

“Two miracles in one day,” said Burton. “That is, if they are such. I prefer a rational explanation.”

“If you compare the exterior and interior of the grail,” said Monat, “you will observe an approximate three centimeter difference in depth. The false bottom must conceal some molar circuitry which is able to convert energy to matter. The energy obviously comes during the discharge from the rocks. In addition to the E-M converter, the grail must hold molar templates—molds—which form the matter into various combinations of elements and compounds.

“I’m safe in my speculations, for we had a similar converter on my native planet. But nothing as miniature as this, I assure you.”

“Same on Earth,” said Frigate. “Before I died, we were making iron out of pure energy. But it was a very complicated and expensive process.”

“Good,” said Burton. “All this has cost us nothing—so far.”

He fell silent for a while, thinking of the dream he had had when awakening. “Pay up,” God had said. “You owe for the flesh.”

Now what had that meant? On Earth, at Trieste, in 1890, he had been dying in his wife’s arms and asking for… what? Something. He could not remember. Then, unconsciousness. And he had awakened in that tank and had seen things that were not on Earth nor, as far as he knew, on this planet.

That experience had been no dream.

They finished eating and replaced the containers in the racks within the grails. Since there was no water nearby, they would have to wait until morning to wash the containers. Frigate, with Kazz’s help, however, had made several containers out of sections of the giant bamboo. He volunteered to go back to the river and fill the sections with water. Nobody objected. Burton wondered at the fellow’s suggestion.

His eyes fell on Alice, and he knew what Frigate was looking for. The youth was hoping to find some congenial female companionship. He had given up hopes for Alice, if he had any, because of Burton’s promise of protection to her.

Burton forgot about that, for the stars had come out in their full splendor. The sky was crowded with gigantic sparks and with several luminous sheets that could only have been nearby gas clouds or galaxies. Never had Earthly eyes seen such an awe-inspiring spectacle.

“We must be in the middle of a big star-cluster,” said Monat. “They are so close together, they don’t even form constellations.”

Burton lay on his back on a pile of grass and puffed at a cigar. It was excellent; in London of his day it would have cost at least a
shilling. He turned his head to watch the others. Monat was looking at the stars. Kazz had lost interest in them and was sitting with his back against a tree, his mouth open, his eyes closed, and his head nodding. The little girl had fallen asleep at once after eating; she lay by Alice with her hand outstretched to touch the woman's leg.

Looking at Alice, as the firelight flickered over the handsome aristocratic face (and bald head) and the curved body, Burton felt stirring what had been dead for some years. On Earth, during the last fifteen years of his life, he had paid heavily for the many fevers and sicknesses suffered while in India, Africa, and South America.

Now, he was young again, and healthy—and suddenly ridden by the strong drives of youth.

Yet he had given his promise to protect her.

Well, she was not the only woman in the world. As a matter of fact, if everybody who had died on Earth were on this planet, she would be only one among many billions.

The hell of it was that she might as well be the only one, at this moment, anyway. He could not get up and walk off into the darkness looking for another woman because that would leave her and the child unprotected. She certainly would not feel safe with Monat and Kazz, nor could he blame her. They were so terrifyingly ugly to human eyes. Nor could he entrust her to Frigate—if Frigate returned tonight, which he doubted—because the fellow was an unknown quantity. The American got sick very readily at unpleasant sights. His courage might be as weak as his stomach.

Burton laughed loudly at his situation and decided that he might as well stick it out for tonight. This thought set him laughing again, and he did not stop until Alice woke to ask him if he were all right.

"More right than you will ever know," he said, turning his back to her. He reached into his grail and extracted the last item. This was a small flat stick of chicle-like substance. Frigate, before leaving, had remarked that their unknown benefactors must be American, for they otherwise would not have thought of providing chewing gum.

After stubbing out his cigar on the ground, Burton popped the stick into his mouth. He said, "This has a strange but rather delicious taste. Have you tried yours?"

"I am tempted," she said. "But I imagine I'd look like a cow chewing her cud."

"Forget about being a lady," said Burton. "Do you think that beings with the power to resurrect you would have vulgar tastes?"

She smiled slightly and placed her stick in her mouth. For a moment they chewed idly, looking across the fire at each other. Burton said, "Frigate mentioned that he knew of you. Just who are you, if you will pardon my unseemly curiosity."

"There are no secrets among the dead," she replied lightly. "Or among the ex-dead."

She was born Alice Pleasance
Liddell on April 25, 1852. (Burton was thirty then.) She was the direct descendant of King Edward III and his son, John of Gaunt. She had had a happy childhood, an excellent education, and had met many famous people of her times: Gladstone, Matthew Arnold, the Prince of Wales. She had married a ‘country gentleman’, liked to hunt, fish, play cricket, raise trees, and read French literature. She had three sons, all captains, two of whom died in the Great War of 1914-1918. (This was the second time that day that Burton had heard of the Great War.)

She talked on and on as if drink had loosened her tongue. Or as if she wanted to place a barrier of conversation between her and Burton.

She talked of Dinah, the tabby kitten she had loved when she was a child, the great trees of her husband’s arboretum, how her father, when working on his Lexicon, would always sneeze at twelve o’clock in the afternoon, no one knew why . . . At the age of 80, she was given an honorary Doctor of Letters because of the part she had played in the genesis of Mr. Dodgson’s famous book. (She neglected to mention the title and Burton, though a voracious reader, did not recall any works by Dodgson, whoever he was.)

“That was a golden afternoon indeed,” she said. “I was ten. My sisters and I were wearing black shoes, white openwork socks, white cotton dresses, and hats with large brims.”

Her eyes were wide as if she were struggling inside herself, and she began to talk even faster.

“Mr. Dodgson and Mr. Duckworth carried the picnic baskets . . . we set off in our boat from Folly Bridge up the Isis, up for a change. Mr. Duckworth rowed stroke. The drops fell off his paddle like tears of glass on the smooth mirror of the Isis, and . . .”

Burton heard the last words as if they had been roared at him.

Astonished, he gazed at Alice, whose lips seemed to be moving as if she were conversing at a normal speech level. Her eyes were fixed on him, but they seemed to be boring through him into a space and a time beyond him. Her hands were half-raised as if she had been so surprised at something that she had been paralyzed.

Every sound was magnified. He could hear the breathing of the other three around the fire, the pounding of their hearts, the gurgle of the workings of their intestines and the breeze as it slipped across the branches of the trees. From far away, came a cry.

He rose and stood listening. What was this? Why the heightening of senses? Why could he hear their hearts but not his? He was also aware of the shape and texture of the grass under his feet. Almost he could feel the individual molecules of the air as they bumped into his body.

Alice too had risen. She said, “What is happening?”, and her voice fell against him like a heavy gust of wind.

He did not reply, for he was staring at her. Now, it seemed to him, he could really see her body for the
first time. And he could see her, too. The entire Alice, the wholly beautiful and undeniably desirable Alice.

At the same time, he saw Kazz stand up. There was no doubt whatever about Kazz’s condition or what he meant to do about it. Kazz reached for Alice, but before he could touch her Burton was on him. He swung with his right fist, and it connected solidly with all the weight of his body behind it. Kazz’s head was thrown back; he staggered back against the tree. Then, he shook his head and staggered toward Alice as if Burton did not exist.

He glanced quickly at Monat. The extra-Terrestrial was sprawled on his back on the ground and looking up at the stars. He did not seem aware that anything extraordinary had taken place.

Alice came towards him with her arms held out, her eyes half-shut, her mouth moist. She swayed, and she crooned, “Richard! Richard!”

Then she stopped; her eyes widened. He stepped towards her, his arms out. She cried, “No!” and turned and ran into the darkness among the trees.

For a second, he stood still. It did not seem possible that she, whom he loved as he had never loved anybody, could not love back.

His paralysis did not last long. She must be teasing him. That was it. He ran after her, and he called her name over and over.

VI

It must have been hours later when the rain fell against him and he woke. Either the effect of the drug had worn off or the cold water helped dispel it, for he seemed to emerge from the dreamlike state abruptly, without transitions. Alice was nowhere in sight.

When he awoke, he was in the gray light of the false dawn. He got up at once and found that, despite the short sleep, he felt refreshed. Nor did he have, as he had expected, any ill effects from the drug. The only thing that hurt was his right hand. It was bruised and torn across the knuckles, slightly swelled, and tender. Frigate, grinning widely, walked into the camp. “You look like the cat who ate the canary,” said Burton.

“That wasn’t all,” replied Frigate. He looked around the site, at Alice, who was glaring at Burton, and at Monat and Kazz yawning and stretching. “Was a good time had by all?”

“It was lively,” said Burton. He picked up his grail and awakened the girl. The others followed him out of the hills and across the plain to the rock. There, after depositing their grails, they stood around and talked to those of their own group or to others. Almost everybody, it seemed, had chewed the gum that night. The results had been tragic, amusing, or gratifying, depending upon the individual. Listening to them, Burton concluded that the substance in the gum was not an aphrodisiac. Not basically, anyway. The reaction of the chewers to it had taken a course which depended on whatever thought or drive was strongest in them at the time.
Consider the case of the husband and wife who had died on Earth at the same time and place and had been resurrected within six feet of each other. They had wept from sheer joy at their good fortune in being reunited. Then they thanked God for their good luck. They had lived together for over fifty years in married bliss; now they looked forward to being together for eternity.

Then, only a few minutes after both had chewed the gum, the man had strangled his wife and thrown her body in the river. He did not wait for any to question him on his behavior but had run away.

Another man had leaped upon the rock and used it as rostrum from which he delivered a speech that lasted all night. To the few who could hear, but were not listening, he had demonstrated the principles of a perfect society and how these could be carried out in practice. Now he was suffering from hoarseness and could only croak a few words.

On Earth he had seldom bothered to vote.

A man and a woman were recovering from the battering they had taken that night. Outraged at the public display of carnality, they had used physical violence to separate couples. The result: bruises, bloody noses, split lips. All theirs. Some men and women had spent the night on their knees praying and confessing their sins.

The sun rose. A few minutes later, the grailrocks spurted blue flame and thundered.

The grails revealed bacon and eggs, ham, toast, butter, milk, jam, a quarter of cantaloupe, and cigarettes.

Within a few minutes, Burton heard a Croat Moslem and an Austrian Jew raging in despair and disgust because their grails contained a product of the tabu swine. A Hindu screamed obscenities because his grail held animal products. A fourth man, crying out that they were in the hands of devils, hurled his cigarettes into the river.

Several said to him, “Why didn’t you give us the cigarettes if you didn’t want them?”

“Tobacco is the invention of the devil; it was the weed created by Satan in the Garden of Eden!”

A man said to him, “At least you could have shared the cigarettes with us. It wouldn’t hurt you.”

“I would like to throw all the evil stuff into the river!”

“Who’s an insufferable bigot and crazy to boot,” said another, and he struck the tobacco-hater in the mouth. Before the tobacco-hater could get up off the ground, he was hit several more times by friends of the man who had knocked him down.

Later the tobacco-hater staggered up and, weeping with rage, said, “What have I done to deserve this, O Lord my God! I have always been a good man. I gave thousands to charities, I worshipped twice a week, I waged a lifelong war against sin and corruption, I . . . .”

“I know you!” shouted a woman at him. She was a tall blue-eyed girl
with a handsome face and well curved figure. “I know you! Sir Robert!”

He stopped talking and blinked at her. “I don’t know you,” he said. “You wouldn’t! But you should! I’m one of the thousands of girls who had to work sixteen hours a day, six and a half days a week, for not enough money to put food in my mouth. I was one of your factory girls. My father worked for you, my mother worked for you, my brothers and sisters, those who weren’t too sick or who didn’t die because of too little or too bad food, dirty beds, drafty windows, and rat bites, worked for you. My father lost a hand in one of your machines, and you kicked him out without a penny. My mother died of consumption. I was coughing out my life, too, my fine baronet, while you —”

The baronet had gone red at first, then pale, then turned and walked off. But the woman ran after him and swung her grail at him. It came around swiftly; somebody shouted; he spun and ducked. The grail almost grazed the top of his head.

“Hmmm,” said Burton, “there’s a weapon of which I had not thought.”

Sir Robert ran past the woman before she could recover and quickly lost himself in the crowd. Hoots of laughter followed him.

Surprisingly, the woman burst out laughing and then began talking to Burton. She introduced herself as Wilfreda Allport. Alice was courteous but cool. Burton accepted her attitude; it was better than could be expected from most English ladies. He was puzzled about one thing, however. Why, after last night, had she continued to stay with him?

“Better the evil you know,” she replied.

But they did not get a chance to continue their talk, for Kazz began to do that which was unacceptable in modern Western European society.

Apparently she was absolutely unconscious of the effect his act would have. Later Burton wondered why he had not caught Kazz doing this before, but he decided that Kazz had not had much in his digestive system.

Now there were cries of outrage and shocked modesty. A man rushed Kazz and tried to knock him down. Kazz caught the man by the arm and lifted him up and hurled him through the air. Wheeling, he picked up his grail and intercepted another attacker with the side of it against the man’s head. The man crumpled, blood welling from his scalp, and lay on the ground.

Burton sprang in between the subhuman and the threatening crowd. He roared, “Stop! This is not a creature of our times! He comes from a period and a place where tabus differ! And, so far, we can communicate with him to a very limited extent. I’m sure that, once he understands how you feel, he’ll shortly pick up a sense of shame. You can teach a dog good manners, you know! Forgive him, for he does not know what he’s doing.”

Frigate and Monat moved up beside Burton, their grails held in
their hands. Then the woman Wilfreda and Alice stood beside the men.

Seeing the outraged ones hesitate, Burton said, "If you think carefully about it, you'll see you may end up doing what he did, too. The only way to be sanitary is to build enclosed latrines here. Without tools, how will you do that?"

VII

Several days later Burton initiated the building of a boat. He had decided that this area was giving no answers to his questions.

It would have been easy to walk away, but travel on the river would be much swifter. Burton's gang, as it was called in that locality, worked well together. Their number increased by three men and three women who had placed themselves under his leadership. They established camp in the hills. The discovery that grainocks existed in the hills also, about a half mile from the mountains and spaced about a mile and a quarter apart, did away with the need to return three times daily to the riverside.

Kazz taught the others how to fashion flint and chert axes, adzes, and scrapers. With the axes, they felled several of the giant Norway pines. After shattering several axes, they began using the chopping technique of the pre-human. He did not swing with the entire arm but used short strokes involving action of the lower arm only.

Frigate, who had spent many years in southeast Asia and Polynesia, initiated them into the secrets of working bamboo. From this versatile plant they made a mast and a boom, woven mats for sails and rope. The double hull of the boat was also fashioned largely from bamboo.

Alice made a bamboo flute and a pan's pipe.

By then the population had found that, though the long grasses were too sharp to use as garments, the iron tree leaves could be used to make somewhat perishable skirts and brassieres. The discovery came too late.

One morning, three weeks after the day of resurrection, the grails refused to yield breakfast for the first time. However, they were not empty. Instead of food, they contained rectangles and strips of some terry cloth-like material. These were colored in many solid hues and could be fastened around the body with magnetic tabs concealed inside the material. Though soft and absorbent, they stood up under the roughest treatment. The sharpest flint could not cut them.

Mankind gave a collective whoop of delight on finding these "towels" as they were called. Though men and women had by then become accustomed or at least resigned to nudity, the more esthetic and the less adaptable had found the universal spectacle of human nakedness ugly and repulsive or both. Now, they had kilts and bras and turbans. The latter were used to cover up their heads while their hair was growing back in. Later, turbans became the customary headgear.
Men were no longer bald, but their beards did not return. Burton was bitter about this. He had always taken pride in his long moustachioes and forked beard; he claimed that their absence made him feel more naked than the lack of trousers.

Wilfreda laughed and said, "I'm glad they're gone. Why, kissing you with those would be like sticking my face in a bunch of broken bed-springs."

"How like you to think of something associated with bed," said Burton and he slapped her across her hips.

By then, it was no secret that she was his woman. She was the type he most liked: blonde, beautiful, good-tempered, willing, and not overly bright. Most of the men and women had paired off by that time. Very few of them retained the original feeling that they were in the valley on probation and, therefore, should behave circumspectly. Nobody had come down from above or broken through the earth below to tell them why they were here and what they must do.

Two months passed. The day of the launching of the boat arrived. They pushed the craft across the plain on big bamboo rollers.

The boat, The Hadji, was about thirty feet long, made of two bamboo hulls fastened together with a platform. It had a single mast and boom, lateen-rigged, and was steered by a great oar of pine. On the platform rested their launch, a dugout fashioned from a pine log.

Before they could get it into the water, Kazz made some difficulties. By now, he could speak a very broken and limited English and some oaths in Arabic, Baluchi, Swahili, and Italian that he had learned.

"Must need... whacha call it?... wallah!... what it word?... kill somebody before place boat on river... you know... merda... need word, Burton- naq... kill man so god, Kabburquanaguerbemss... water god... no sink boat... get angry... eat us."

"Sacrifice?" said Burton.

"Many bloody thanks, Burton-naq. Sacrifice! Cut throat... put on boat... rub it on wood... then water god not mad to us."

"We don't do that," said Burton.

Kazz argued but finally agreed to get on the boat. His face was long, and he looked very nervous.

Burton, to ease him, told him that this was a different world, as proved by the stars, and that the gods did not live in this valley. Kazz smiled, but it was several days before he quit looking into the river as if he expected to see the hideous green-bearded face and bulging fishy eyes of Kabburquanaguerbemss rising from the depths towards him.

That evening, as they made their first beaching, an incident occurred that puzzled Burton.

Kazz had just stepped ashore among a group of curious people when he became very excited. He began to jabber in his native tongue and tried to seize a man standing near. The man fled and was quickly lost in the crowd.
When asked by Burton what he was doing, Kazz said, “He not got . . . uh . . . whacha call it? . . . it.” and he pointed at his forehead. Then he traced several unfamiliar symbols in the air. Burton meant to pursue the matter until he found out what Kazz was talking about, but at that very moment Alice cried out and ran up to a man. Evidently she had thought he was one of her sons killed in World War I. There was some confusion; the man denied it. Later Alice admitted that she had made a mistake. By then other business came up and he could not get back to Kazz.

Kazz did not mention the matter again, and Burton forgot about it. He was to remember.

Exactly 490 days later, they had passed 37,600 grailrocks on the right bank of The River.

This meant that they had sailed with the current and the wind approximately 37,600 miles. On Earth, that distance would have been about one and a half times around the equator. Yet the river went on and on, making great bends, winding back and forth. Everywhere, the plains along the river, the tree-covered hills beyond, and, towering, impassable, unbroken, the mountain range.

Occasionally the plains narrowed and the hills advanced to the river-edge. Sometimes the river widened and became a lake — three miles, five miles, six miles across. Now and then the line of the mountains curved in towards each other, and the boat shot through canyons where the narrow passage of the river stepped up its pace and the sky was a blue ribbon far above and the black walls pressed depressingly in on them.

Usually the river and the terrain were the same. And, always, there was humankind. Day and night, men, women, and children thronged the banks of the river.

By then, those aboard the boat recognized a pattern. Humanity had been resurrected along the river in a rough chronological and national sequence. The boat had passed by the area that held Slovenes and Austrians who had died in the last decade of the nineteenth century, had passed by Hungarians, Norwegians, Finns, Greeks, Albanians, and Irish. However, occasionally, they put in at areas which held peoples from other times and places. One was a twenty-mile stretch containing Australian aborigines who had never seen a European while on Earth. Another hundred-mile length was populated by Tocharians. These had lived around the time of Christ in what later became Chinese Turkistan. They represented the easternmost extension of Indo-European speakers in ancient time; their culture had flourished for a while, then died before invasions and the encroachment of the desert that brought famine with it.

Through admittedly hasty and uncertain surveys, Burton had determined that each area was comprised of about 60% of a particular nationality and century, 30% of some other one people, usually from a different time, and 10% from any
random time and place. The reason for this mixing was unknown.
There were other things. So far, they had neither seen nor heard of
a pregnant woman. Whoever had placed them here must have steril-
ized them and with good reason. If mankind could reproduce, the river-
valley would be jammed solid with bodies within a few years.

At first, there had seemed to be no animal life but man. Now it was
known that, at night, several species of worms emerged from the soil.
And the river contained at least a hundred species of fish, ranging
from creatures six inches long to six feet. Frigate considered that the
animals were there for a good purpose. The fish served as scavengers
to keep the river waters clean. Some types of worm ate waste
matter and corpses. Other types served the normal function of earth-
worms.

The children were growing up. Within fifteen years, there would
not be an infant or adolescent within the valley, if conditions every-
where conformed to what the voyagers had so far seen.

On the 490th day after launching, the boat entered a three-mile
wide lake. It was nearing noon, grail-charging time. Burton steered the
craft towards the nearest rock; then he changed his mind.

The people gathered there had aroused his suspicious. They con-
sisted of a number of armed men obviously guarding a larger group
of unarmed men and women. The latter were dirty, downcast, and
naked, and their ribs could easily be counted.

As the boat swung away, the armed men, who had been waving
cordially at the boat’s occupants, sprang into action. One of them
shouted, and drums began beating in the distance. About a half mile
ahead of them, men ran out of a wooden fortress. They pushed two
long boats into the waters, and then began paddling strongly towards the
Hadji. Seeing that resistance was useless against two boats, each filled
with about thirty men, Burton tried flight. He directed the craft towards
the other shore; if they could get there they could run on foot toward
the hills.

However, before he had reached the middle of the lake, the warcan-
oes were almost upon him. A tall blond in the bow of the leading
craft stood up and shouted in German, “Do not fight! We do not wish
to kill you. We merely want you to work for us!”

Burton spoke to the women. “We’ll try to hold them up long
enough for you to get away. Start swimming!”

“We’ll drown,” said Alice. She was staring with her large doe-like
eyes at the approaching boats, the big paddles dipping in unison, the
paddlers grinning wolfishly at the women.

“Better that than what that gang will do to you,” he said. “Quickly!
We can’t hold them long.”

“I can’t swim very good,” said Wilfreda. “Anyway, what can they
do that hasn’t been done to me?”

Loghu, the red-haired green-eyed
Tocharian whom Frigate had picked up, said, "Me, I won’t leave Pete."
"You’re all three bloody fools," said Burton angrily. "Very well. If you won’t run, fight. Get your spears. And you, Gwenafra," he said to the little girl, "you lie down on the deck."

Kazz stood up, placed a stone in his sling, made of human leather, and whirled it over his head. The stone shot out, and the man in the bow feel backwards and over the side into the river. At that, those in the canoes gave a loud cry. While the rest paddled, six on each stood up and cast their spears. The crew of the Hadji ducked down behind the railing; the spears either struck the water or thudded into the railing. Burton and Monat rose and wrenched the spears loose and threw them back. Since they were standing on a much more stable platform, they were able to get a better aim. The flint head of Burton’s shaft buried itself in the chest of a paddler. Monat’s plunged into the thigh of another. A second stone from Kazz hit a paddler’s arm and rendered it useless.

Again, the six on each canoe threw, and, under cover of this barrage, the warcanoes rammed into the Hadji. Burton signalled to Kazz, who leaned over and raised a huge stone above his head. Though the rock had added to the weight on the boat, Burton had decided to carry it for just such a situation as this. While the crew of the Hadji hurled spears, Kazz dropped the stone onto one of the canoes. It
crashed through the thin bottom; in a minute, the canoe was sinking and its crew was in the water.

However, the men in the other canoe had pulled it broadside of the Hadji. Thirty of them came over the railing at the same time.

The Hadji began to tip and undoubtedly would have capsized under the uneven distribution of weight if it had not been for its double-hull construction. Burton cursed at this. Better for them all to be in the water; some might be able to escape in the confusion.

He thrust a spear at a face coming over the side and drove it through the mouth. The face fell back, but the stone tip, deeply lodged in the neckbones, went with it. Burton dropped the wooden shaft and picked up another spear from the deck. He saw a hand, holding a club, rise over the railing, and he ran his spear through the hand, pinning it to the railing. Then he seized the fallen club and leaped among the invaders.

VIII

It was a good fight while it lasted. Burton, one of the foremost swordsman of his time, wielded the club as if it were a saber. Kazz disarmed a man, picked him up, threw him, and knocked down two others with the body. Alice ran a spear into one of the fallen men but received a deep gash in her side from a javelin. Burton brained the man who had wounded her, then reeled back as the butt of a spear struck him on the head.
Monat, who combined long reach with a terrifyingly alien appearance, put three men out of combat. Then he was hit across the shins with a club and fell. Frigate, bleeding from four places, fought wildly but went under when three men piled on top of him.

One of the boarders seized Gwenafra and threw her into the river. She rose once, screamed, and then went under.

The result was inevitable and might have been over sooner except that the strangers seemed bent on capturing rather than killing them. However, four of Burton's group were dead, and all were wounded. Burton took sour satisfaction in noting that their attackers must have lost at least twenty dead from slingstones, spears, or drowning, and that ten of them were wounded to various degrees.

Their leader, a tall rawboned redhead Scot with a pronounced Highland accent, did not seem perturbed about the casualties. Instead, he congratulated the crew of the Hadji. "You put up such a bonnie battle, some of you may get a chance to join us," he said. "As soldiers, I mean. Not as slaves. You'll all join us in one way or another."

The Hadji was sailed, not toward the stockade from which the canoes had emerged, but about a mile further down the lake. Here it was put ashore near another and larger stockade of pine logs and earthen ramparts and sentinel boxes at each corner. A great log gate was open; through this the captives were marched. Inside the walls were several log blockhouses. The central one was a two-story building about fifty feet long. The captives were taken into its dark and cool interior where they blinked for a while before their eyes became adjusted. They saw that the lower story was one long hall with a single table and benches in the center on the dirt floor. Before this they were halted for an inspection by two men.

One was a short muscular man with a hairy body, black curly hair, brown eyes, and an aquiline nose. The second had blond hair, eyes that could have been blue or green and a fat-encircled waist which indicated too much food and liquor.

"You look like Hermann Goering," said Frigate in German, and then he dropped to his knees and screamed with pain from the butt of a spear slammed against his back.

The blond said, in English, "No more of that unless I order it. Let them talk."

He scrutinized them for several minutes, then said, "Yes, I am Hermann Goering."

"Who is Goering?" said Burton. "Your friend can tell you later," said the German. "If there is a later for you. Now, I have been told about the battle you put up. I am not angry about that; I admire men who can fight well. And, since I can always use more spears, I offer you a choice. You men, that is. Join me and live well with all the food and liquor and women you can possibly want. Or work for me as my slaves."
"For us," said the other man. "You forget, Hermann, dat I have jyst as muck to say about dis as you."

Goering smiled and chuckled and said, "Of course! I was only using the royal I, you might say. Very well, we. If you swear to serve us, and it will be far better for you if you do, you will swear loyalty to me, Hermann Goering, and to the one-time king of ancient Rome, Tullios Hostilios."

Could this man actually be the legendary third king of ancient Rome? Of Rome when it was a small village threatened by the other Italic tribes, the Sabines, Aequi, and Volsci, who, in turn, were being pressed by the Umbrians, themselves pushed by the powerful Etruscans? Was this really Tullios Hostilios, warlike successor to the peaceful Numa Pompilius? There was nothing to distinguish him from a thousand men whom Burton had seen on the streets of Florence. Yet, if he was what he claimed to be, he could be a treasure trove, historically and linguistically speaking. He would, since he was probably Etruscan himself, know that language, plus archaic Latin and Sabine and perhaps Campanian Greek. He might even have been acquainted with Romulus, supposed founder of Rome. What stories that man could tell! And what stories he could be told, the history of the rise and change — for Rome did not really fall — of the sons of the she-wolf.

"Well?" said Goering. "What do we have to do if we join you?" said Burton.

"First, I . . . we . . . have to make sure that you are the caliber of man we want. In other words, a man who will do anything that we order, unhesitatingly and immediately. We will give you a little test."

He ordered a group of slaves brought forward. Besides being gaunt, these were all crippled.

"They were injured while carrying stone or building our walls," said Goering. "Except for two caught while trying to escape; they will have to pay the penalty. All of them will be killed by us because they are now useless. So you should not hesitate about killing them to show your determination to serve us."

He added, "Besides, they are all Jews. Why worry about them?"

The Scot took a large club studded with obsidian blades and held it out to Burton. Two guards seized a slave and forced him to his knees. He was a large blond with blue eyes and a Grecian profile; he glared at Goering and then spat at him.

Goering laughed. "He has all the arrogance of his race. I could reduce him to a quivering screaming mass begging for death. If I wanted to. But I do not care for torture. My compatriot would like to give him a taste of the fire, but I am essentially a humanitarian."

"I will kill in defense of my life or in defense of those who need protection," said Burton. "But I am not a murderer."

"Killing this Jew would be an act in defense of your life," replied Goering. "If you do not, you will die
anyway. Only it will take you a long time.”

“I will not,” said Burton.

Goering sighed and said, “You English! Well, I would rather have you on my side. But if you don’t want to do the rational thing, so be it. What about you?” he said to Frigate.

Frigate said, “Your ashes ended in a trash heap in Dachau because of what you did, what you were. Are you going to repeat all that here?”

Goering laughed and said, “I know what happened to me. Enough of my Jewish slaves have told me about that.”

He pointed at Monat. “What kind of a freak is this?”

Burton explained. Goering looked grave, then said, “I couldn’t trust him. He goes into the slave camp. You, there, apeman. What do you say?”

Kazz, to Burton’s surprise, stepped forward. “I kill for you. I don’t want to be slave.”

He took the club while the guards held their spears poised to run him through if he had other ideas for using it. He glared at them from under his shelving brows, then raised the club. There was a crack, and the slave pitched forward on the dirt. Kazz returned the club to MacDonald and stepped aside. He did not look at Burton.

The guards marched the other slaves out. Goering said, “All the slaves will be assembled tonight, and they will be shown what will happen to them if they try to get away. The escapees will be roasted for a while, then put out of their misery. My distinguished colleague will personally handle the club. He likes that sort of thing.”

He pointed to Alice. “That one. She will be with me tonight while the executions are taking place.”


Burton gave a roar, snatched a club from MacDonald’s hand and leaped upon the table. Goering fell backwards; the tip of the club narrowly missed his nose. At the same time, the Roman thrust his spear at Burton and wounded him in the shoulder. But Burton kept hold of the club, whirled, and knocked the weapon out of Tullios’ hand.

The slaves threw themselves upon the guards and tried to wrest their weapons from them. Frigate jerked a spear loose and brought the butt of it against Kazz’s head. Kazz crumpled, unconscious. Monat kicked a guard in the groin and picked up his spear.

Burton did not remember anything after that. Something struck him on the head, his knees gave way, and he was nothing.

He awoke several hours before dusk. He was on grass and in a large enclosure of pine logs, a stockade with a diameter of about fifty yards. Fifteen feet above the surface, circling the interior of the wall, was a wooden walk. On this, armed guards paced.

He groaned, for his head hurt
very much. Frigate, squatting near him, said, "I was afraid you'd never come out of it."

"Where are the women?"

Frigate began to weep. Burton shook him and said, "Quit blubbering. Where are they?"

"Where the hell do you think they are?" said Frigate. "Oh, my God!"

"We may be on a different planet," said Burton, "but the people haven't changed. Don't think about the women. There's nothing you can do. Why wasn't I killed after I attacked Goering?"

Frigate wiped away the tears and said, "Beats me. Maybe they're saving you, and me, for the fire. As an example. I wish they had killed us."

"What, so recently gained paradise and wish so soon to lose it?" said Burton. He began to laugh but quit because it hurt his head.

Later, during the day, Burton cleared up one of the things that had puzzled him. That was, why he had not been warned about Goering by the people in the neighboring areas up-river. Certainly, when the Hadij had put into shore for grail-recharging, the crew could have been told about the dangers it was soon to meet. He talked to Robert Spruce, one of the English slaves, and Spruce said that it was less than a month since Goering and Tullios had seized power. Afterward the two had been very careful to keep all their activities as secret as possible. For the time being they left their neighbors in peace. Eventually, of course, they would try to conquer the adjacent territories. So far, however, no slave had escaped to spread word about Goering's intentions.

"But the people on the borders can see for themselves that the walls are being built by slaves," said Burton.

Spruce grinned wryly and said, "Goering has spread the word that these are all Jews, that he is only interested in enslaving Jews. So what do they care? As you can see for yourself, that is not true. Half of the slaves are Gentile."

At dusk, Burton, Frigate, and Monat were taken from the stockade and marched down to a grailrock. There they found about two hundred slaves, guarded by the Goeringites. The grails of all were placed on the rock, and they waited. After the blue flames roared the grails were taken down. Each slave opened his grail. Guards removed the tobacco, liquor, and most of the food.

"We are seeing the beginning of a new form of servitude: grail-slavery," said Burton. "Which also may explain why we weren't killed. Only the individual owner of a grail is able to open it. If you kill a slave, you can't use his grail."

"I'll bet something like this is springing up all along the valley," said Frigate. "As I remember your books, you thought quite a lot of the institution of slavery. What do you think of it now?"

"That was Oriental slavery," said Burton. "This is different. There's no chance for a slave to gain his freedom and rise in this society. Nor is there any personal feeling, except
hatred, between slave and owner. In
the Orient, the situation was differ-
et. Of course, like any human in-
stitution, it had its abuses.”

“You’re a stubborn man,” said
Frigate. “Have you noticed that at
least half the slaves are Jews? Late
twentieth-century Israeli, most of
them. That girl over there told me
that Goering managed to start grail-
slavery by arousing anti-Semitism in
this area. Then, after he had gotten
into power with Tullios’ aid, he en-
slaved many of his former suppor-
ters.”

He continued, “The hell of it is,
Goering is not a genuine anti-Sem-
ite. During World War II he per-
sonally intervened with Himmler and
others to save Jews. He is some-
thing even worse than a genuine
Jew-hater. He is an opportunist.
Anti-Semitism was a tidal wave in
Germany; to get any place, you had
to ride the wave. So Goering rode,
just as he did here. An anti-Semite
like Goebbels and Frank, for in-
stance, believed in their professed
principles. Perverted and hateful
principles, true, but still principles.
Whereas big fat happy-go-lucky
Goering did not really care one way
or the other about the Jews. He just
wanted to use them.”

“All very well,” said Burton, “but
what has that got to do with me?”

“Dick,” said Frigate, “I admire
you as I have never admired any
other man. On Earth, you were my
hobby. I collected all books by and
about you. I even wrote a long biog-
raphy and visited many of the places
made famous by your explorations.
I made a pilgrimage to your tomb
at Mortlake; I formed a Burton So-
ciety and raised funds to restore
your tomb—which was falling apart,
grown around with weeds . . . But
I am not blind. I know your faults.”

“Just which one is it this time?”
said Burton testily.

“That book. The Jew El Islam,
and the Gypsy. It was published af-
er you died. Dick, how could you
have written it?”

“I was still angry because of the
injustices I had suffered at Damas-
cus. To be expelled from the con-
sulate because of the lies of my en-
emies, among whom . . .”

“That doesn’t excuse your writing
lies about a whole group,” said Frig-
ate.

“Lies! I wrote the truth! And I
don’t have to answer to you or to
any man for my actions.”

“So,” said a voice. “You are
here, also. We meet again,
and not under very auspicious cir-
cumstances. I walked away from
you—yet here we are together.”

The speaker was Lev Ruach.

“I could not help overhearing the
conversation,” he said, smiling wan-
ly at them. “Nor do I need to apol-
ogize. Slaves have no privacy. Bur-
ton, welcome to the concentration
camp. This is probably your first
taste of it. But it is an old old story
to me. I was in a Nazi camp, and I
escaped. I was in a Russian camp,
and I escaped. In Israel, I was cap-
tured by Arabs and tortured. I es-
caped.

“So now I think perhaps I can es-
cape again. But to what? Another
concentration camp? There seems to
be no end to them. Man is forever building them and putting the perennial prisoner, the Jew, in them. Even here, where we have a fresh start, where all religions, all prejudices, should have been shattered on the anvil of resurrection, little is changed."

"Shut your mouth," said a man near Ruach. About six foot in height, he was built like a wrestler. He had red hair so curly it was almost kinky, blue eyes, and a face that might have been handsome if it had not been for his broken nose.

"Dov Targoff here," he said in a crisp Oxford accent. "Late commander in the Israeli Navy. Pay no attention to Ruach. He's one of the old-time Jews, a pessimist, a whiner. He'd rather wall against the wall than stand up and fight like a man."

Ruach choked, then said, "You arrogant Sabra! I fought; I killed! And I am not a whiner. What are you doing now, you brave warrior? I see you every day, slaving naked in the sun, submitting to every indignity that I . . . ."

"It's the old story," said a woman. She was tall and dark-haired and probably would have been a beauty if she had not been so gaunt. "The old story. We fight among ourselves while our enemies conquer. Just as we fought when Titus besieged Jerusalem and we killed more of our own people than we did the Romans. Just as . . . ."

The two men turned against her, and all three argued loudly until a guard stepped up to them and began beating them with a stick.

Later, through swollen lips, Tar-

goff said, "I can't take much of this longer. Soon . . . Well, that particular guard is mine to kill."

"You have a plan?" said Frigate eagerly, but Targoff would not answer.

IX

Shortly before dawn, the slaves were awakened and marched to the grailwork. Again they were left with a modicum of food. After eating, they were split up into groups and marched off to their differing assignments.

Burton and Frigate were taken to the northern limits of the area dominated by the Goering-Tullios gang. There they were put to work with a thousand other slaves, and they toiled naked all day in the sun. Their only rest was when they took their grails to the rock at noon and were fed.

At the point where the river suddenly broadened into a lake, the mountains also bent in towards the shore. The plain and the hills stretched not more than one and a half miles between the mountain and the river. Goering meant to build a wall between the mountain and the river; he also intended to erect another wall, which would run for the full ten-mile length of the lakeshore, and a third wall at the southern end.

Burton and the others had to dig a deep trench and then pile the dirt taken from the hole into a wall. This was hard work, for they had only stone hoes with which to hack at the ground. Since the roots of the
grass formed a thickly tangled complex of very tough material, they could be cut only with repeated blows. The mingled dirt and roots were scraped up on wooden shovels and tossed onto large bamboo sleds. These were dragged by teams onto the top of the wall, where the dirt was shoveled off to make the wall even higher and thicker.

At night the slaves were herded back into the stockade. Most of them fell asleep almost at once, but Targoff, the red-headed Israeli, squatted by Burton.

"The grapevine gives a little juice now and then," he said. "I heard about the fight you and your crew put up. I also heard about your refusal to join Goering and his swine."

"What do you hear about my infamous book?" said Burton.

Targoff smiled and said, "Your actions speak for themselves. Besides, Ruach is very sensitive about such things—not that you can blame him after what he went through on Earth. But I do not think that you would behave as you did if you were what he said you are. I think you're a good man, the type we need. So . . ."

Days and nights of hard work and short rations followed. Burton learned enough through the grapevine that Alice and the other two women were still being kept in the long hall. Wilfreda was in MacDonald's apartment with several other women. Loghu was living with Tullios. Alice had been kept by Goering for a week, then was turned over to one of his lieutenants, von Kreyscharft, a Prussian who had been killed at Waterloo. Rumor was that Goering had complained of her coldness and had wanted to give her to his bodyguard to do with as they pleased. But von Kreyscharft had asked for her and gotten her.

Burton, hearing this, was in agony. He knew what a proud and sensitive woman she was; he could imagine her state. He decided to take action very soon. Late that night, while the sentries were occupied talking on the walk, he crawled over to Targoff.

"You said you knew I must be on your side," he whispered. "When are you going to take me into your confidence? I might as well warn you now that, if you don't do so at once, I intend to foment a break among my own group and anybody else who will join me."

"Ruach has told me more about you," said Targoff. "Could a Jew trust anyone who wrote such a book? Or could he be trusted not to turn on them after the common enemy has been defeated?"

Burton opened his mouth to speak angrily, then closed it. For a moment he was silent; when he spoke, he was calm. "In the first place, my actions on Earth speak louder than any of my printed words. I was the friend and protector of many Jews; I had many Jewish friends."

"That statement is always a preface to an attack on the Jews," said Targoff.

"Perhaps. However, even if what Ruach claims were true, the Richard Burton you see before you in
this valley is not the Burton who lived on Earth. I think every man has been changed somewhat by his experience here. If he hasn't, he is incapable of change, inflexible. He would be better off dead.

"During the five hundred and ninety days that I have lived on this river, I have learned much. Some of my 20th century friends, Frigate especially, have cleared me of my superstitions and enlightened my ignorance. I resisted this knowledge, true, as most men resist things that go against their fallacies and prejudices. But I can say, with no false pride, that I am more open-minded than many men. Believe me, I have argued frequently and passionately with Frigate and Monat. And, though I did not want to admit it at the time, I was strongly influenced by them and did much reconsideration."

"Jew-hate is something bred into the child," said Targoff. "It becomes part of the nerve. No act of will can get rid of it, unless it is not deeply embedded or the will is extraordinarily strong. The bell rings, and Pavlov's dog salivates. Mention the word Jew, and the nervous system storms the citadel of the mind."

"I have pleaded enough," said Burton. "You will either accept me or reject me. In either case, you know what I will do."

"I accept," said Targoff. "I've worked with you, eaten bread with you. I like to think I'm a good judge of character. Tell me, if you were planning this, what would you do?"

Targoff listened carefully. At the end of Burton's explanation, Targoff nodded. "Much like my plan. Here is what we will do. Now . . ."

The next day, shortly after breakfast, several guards came for Burton and Frigate. Targoff kept a stony face, but he looked hard at Burton, who knew what Targoff was thinking. Nothing could be done about it except to march off to Goering's "palace." There they found the German seated in a big wooden chair and smoking a pipe. He asked them to sit down and offered them cigars and wine.

"Every once in a while," he said, "I like to relax and talk with somebody besides my colleagues. They are not overly bright. I like especially to talk with somebody who lived after I died. And to men who were famous in their time. I've few of either type so far."

"Many of your Israeli prisoners lived after you," said Frigate.

"Ah, the Jews!" Goering airily waved his pipe. "That is the trouble; they know me too well. They are sullen when I try to talk to them, and too many have tried to kill me for me to feel comfortable around them. Not that I have anything against them. I had many Jewish friends . . ."

Burton reddened as Goering sucked on his pipe and continued, "Der Fuehrer was a great man, but he had some idiocies. One of them was his attitude toward Jews. Myself, I cared less. But the Germany of my time was anti-Jewish, and a man must go with the Zeitgeist if he wants to get any place in life. Enough of that."
He chattered on for a while, then asked Frigate many questions concerning the fate of his contemporaries and the history of postwar Germany.

"If you Americans had had any political sense, you would have declared war on Russia as soon as we knew we were beaten. We would have fought with you against the Bolshevik. We would have crushed them."

Frigate did not reply. Goering laughed and told several very obscene stories. Then he asked Burton to tell him about the strange experience he had had before being resurrected in the valley.

Burton was surprised at Goering's knowledge. Had he learned about this from Kazz, or was there an informer among the slaves?

He told his story of the floating bodies and also gave Monat's theory. Goering looked thoughtful. "So there is nothing supernatural about all this. After the first few days here, I began to think so myself. Tell me, have you changed your mind about joining me?"

Burton stood up. "I would not be under the orders of a man who takes women by force," he said. "Moreover, I respect the Israelis. I would rather be a slave with them than free with you."

"Very well," said Georing. "But, I've been having trouble with the Roman. If we have a power struggle, and I lose, you will see how merciful I have been to you slaves. You do not know him. Only my intervention has saved one of you being tortured to death for his amusement."

"Good luck!" said Frigate enigmatically.

At noon, the two returned to their work in the hills. Neither got a chance to speak to Targoff or any of the slaves, since their duties happened not to bring them into contact. They did not dare make an open attempt, for that would have meant a severe beating.

After they returned to the stockade in the evening, Burton went to Monat and several others he had befriended. He told them what had happened. "More than likely Targoff will not believe my story. He'll think we're spies. Even if he's not certain, he can't afford to take chances. So there'll be trouble. It's too bad that this had to happen, for the escape plan will be cancelled for tonight."

Nothing untoward took place—at first. The Israeli avoided Burton and Frigate. Then the stars came out, and the stockade was flooded with a light almost as bright as a full moon of Earth.

The guards, as if sensing tension, became more alert. They consulted among themselves and peered down from the walk at the sun-and-dirt blackened bodies of the slaves.

"Targoff will do nothing until it rains," said Burton. He referred to the fact that the clouds always appeared at about three in the morning and were shortly afterward followed by a half-hour of downpour. He appointed a round of guards and then prepared for an hour's sleep. Frigate was to stand first watch. Spruce, one of their new friends, was
to take second. Burton would be third.

It seemed he had scarcely closed his eyes before Spruce had touched him. He rose quickly to his feet and yawned and stretched. The others were all awake. Within a few minutes, the clouds formed. In ten minutes the stars were blotted out. Thunder grumbled way up in the mountains, and the first of the lightning flashed through the sky.

Suddenly the heavens emptied. The slaves had already jammed under the slight protection of the walk circling the interior of the stockade. Every night they were soaked; and only the fact that all diseases of physical origin seemed to have vanished saved them from colds and pneumonia.

Lightning struck near. By its flash Burton saw that the guards were huddled under the roofs sticking out from the base of the watch houses at each corner of the stockade. They were covered with towels against the chill and the rain.

He waited until darkness rushed in after the lightning. Then he walked to Targoff and said, “Does the plan still hold?”

“You know better than that,” said Targoff. A bolt of lightning showed his angry face. “Judas!”

He stepped forward, and a dozen men followed him. Burton felt mud thrown on him and heard the impact of a heavy object that must have fallen from a distance. He paused for another flash to reveal the object. A guard lay sprawled face down before him; the back of his head was smashed in.

Targoff, who had also seen the corpse, said, “What’s going on, Burton?”

“Wait,” replied the Englishman. He had no more idea than the Israeli, but anything unexpected could be to his advantage.

Lightning came again, and it illuminated the dwarfish figure of Kazz on the wooden walk inside the wall. He was swinging a huge stone axe against a group of guards who were in the angle formed by the meeting of two walls. Another flash. Two guards were sprawled out on the wall. Darkness. At the next blaze of light, another was down; the remaining two were running away down the walk in different directions.

Another bolt very near the wall showed that, finally, the other guards were aware of what was happening. They ran down the walk, shouting and waving their spears. Kazz ignoring them, slid a long bamboo ladder down into the enclosure and then threw a bundle of spears after it. By the next flash he could be seen advancing towards the nearest guards.

Burton snatched a spear, placed the shaft between his teeth, and climbed, almost ran, up the ladder. Behind came the others, including the Israeli. All thought of killing him as a traitor was gone.

The fight was bloody but brief. With the guards on the wall either stabbed or hurled to their deaths, only those in the watchhouses remained. The ladder was carried to the other end of the stock-
ade and placed against the gate. In two minutes, men had climbed to the outside, dropped down, and opened the gate. For the first time Burton found the chance to talk to Kazz.

"I thought you had sold us out!"

"No. Not me, Kazz," said the subhuman reproachfully. "You know I love you, Burton-naq. You're my friend, my chief. I pretend to join your enemies because that playing it smart. I surprise you don't do the same! You're no dummy."

"Certainly, you aren't," said Burton. "But I couldn't bring myself to kill those slaves to prove myself."

Lightning showed Kazz shrugging. He said, "That don't bother me. I don't know them. Besides, you hear Goering. He say they die anyway."

"It's a good thing you chose tonight to rescue us," said Burton. He did not tell Kazz why since he did not want to confuse him. Moreover, there were more important things to do.

"Tonight's a good night," said Kazz. "Big battle's going on. Tullios and Goering get very drunk and quarrel. They fight; their men fight. While they kill each other, invaders come. Those brown men across the river... what you call them? Onondagas, that's them. Their boats come just before rain come. They make raid to steal slaves, too. Or maybe just for the hell of it. So I think, now's good time to start plan, get Burton-naq free."

As suddenly as it had come, the rain ceased. Now Burton could hear shouts and screams from far off, towards the river. Drums were beating up and down the riverbanks. He said to Targoff, "We can either try to escape and probably do so easily or we can attack."

"I intend to wipe out the beasts who enslaved us," said Targoff. "There are other stockades nearby. I've sent men to open their gates. The rest are too far away to reach quickly, they're strung out at half-mile intervals."

By then, the blockhouse in which the off-duty guards lived had been stormed. Armed, the slaves started walking toward the noise of the conflict. Burton's group was placed on the right flank. They had not gone half a mile before they came upon corpses and several wounded, a mixture of Onondagas and whites.

Despite the heavy rain, a fire had broken out. By its increasing light they saw that the flames came from the longhouse. Outlined in the glare were struggling figures. Even as the escapees advanced across the plain, they saw one side break and run toward them. Behind came the victors, whooping and screaming jubilantly.

"There's Goering," said Frigate. "His fat isn't going to help him get away, that's for sure."

He pointed, and Burton could see the German desperately pumping his legs but falling behind the others. "I don't want the Indians to have the honor of killing him," Burton said. "We owe it to Alice to get him."

The tall figure of MacDonald was ahead of them all, and it was toward him that Burton threw his spear. To the Scot the missile must
have seemed to come out of the darkness from nowhere. Too late, he tried to dodge. The flint head buried itself in the flesh between his left shoulder and chest, and he fell on his side. Before he could rise again he was pushed back down by Burton.

MacDonald’s eyes rolled; blood trickled from his mouth. He pointed at another wound, a deep gash in his side just below the ribs. “You... your woman... Wilfreda... did that,” he gasped. “But I killed her...”

Burton wanted to ask him where Alice was, but Kazz, screaming phrases in his native tongue, brought his club down on the Scot’s head. Burton picked up MacDonald’s spear and ran after Kazz. “Don’t kill Goering!” he shouted. “Leave him to me!”

Kazz did not hear him; he was busy fighting with several Onondagas. Moreover, Burton saw Alice.

He reached out, grabbed her and spun her around. She screamed and started to struggle. Burton shouted at her; suddenly, recognizing him, she collapsed into his arms and began weeping. Burton would have tried to comfort her, but he was afraid that Goering would escape him. Pushing her away, he ran toward the German and threw his spear. It grazed Goering’s head, and he screamed and stopped running and began to look for the weapon. Then Burton was on him. Both fell to the ground and rolled over and over, each trying to strangle the other.

Something struck the Englishman on his head from behind. Stunned, he released his grip. Goering pushed him down on the ground and dived toward the spear. Seizing it, he rose and stepped toward the prostrate Burton. Burton tried to get to his feet, but his knees seemed to be made of putty and everything was whirling. Alice tackled Goering around the legs from behind, and he fell forward. Burton made another effort, found he could at least stagger, and sprawled over Goering. Again, they rolled over and over. Goering began squeezing on Burton’s throat just as a shaft slid over Burton’s shoulder, burning the skin, and its stone tip drove into Goering’s throat.

Burton stood up, pulled the spear from the flesh, and plunged it into the man’s fat belly. Goering tried to sit up, but he fell back and died. Alice slumped to the ground and wept.

Dawn saw the end of the battle. By then the slaves had broken out of every stockade. The warriors of Goering and Tullios were ground between the two forces, Onondaga and Israeli-English, like husks between millstones. Afterward, the ex-slaves had continued fighting. The Indians, who had raided only to loot and get more slaves and their grails, retreated. They climbed aboard their dugouts and bamboo canoes and paddled across the lake. Nobody felt like chasing them.

The days that followed were busy ones. A rough census indicated that at least half of the 20,000 inhabitants of Goering’s little king-
dom had been killed, severely wounded, by the Onondaga, or had fled. The Roman, Tullios, had apparently escaped.

The survivors chose a provisional government. Targoff, Burton, Spruce, Ruach, and two others formed an executive committee with considerable, but temporary, powers.

Alice Hargreaves moved into Burton’s hut without either saying a word about the why or wherefore. Later she said, “Frigate tells me that if this entire planet is constructed like the areas we’ve seen, and there’s no reason to believe it isn’t, then the river must be at least 20,000,000 miles long. It’s incredible, but so is our resurrection. Also, there may be over 37 billion people living along the river. What chance would I have of ever finding my Earthly husband?

“Moreover, I love you. Something has changed in me, perhaps all I’ve been through. I don’t think I could have loved you on Earth. I might have been fascinated, but I would also have been repelled, perhaps frightened. I couldn’t have made you a good wife there. Here I can—even though there doesn’t seem to be any authority or religious instructions that could marry us. That in itself shows how I’ve changed. That I could be calmly living with a man I’m not married to . . . ! Well, there you are.”

“We’re no longer living in the Victorian age or the 20th century,” said Burton. “What would you call this present age—the River Age?”

“Providing it lasts,” said Alice.
"It started suddenly; it may end just as swiftly and unexpectedly."

Certainly, thought Burton, the blue river and the grassy plain and the forested hills and the unscalable mountains did not seem like Shakespeare's insubstantial vision. They were solid, real, as real as the men walking toward him now: Frigate, Monat, and Kazz. He stepped out of the hut and greeted them.

Kazz began talking. "A long time ago, before I speak English good, I see something. I try to tell you then, but you don't understand me. I see a man who don't have this on his forehead."

He pointed at the center of his own forehead and then at that of the others. "I know," Kazz continued, "you can't see it. Pete and Monat can't either. Nobody else can. But I see it on everybody's forehead. Except that man I try to catch long time ago. Then, one day, I see a woman don't have it, but I don't say nothing to you. Now I see a third person who don't have it."

"He means," said Monat "that he is able to perceive certain symbols or characters on the forehead of each and every one of us. He can see these only in bright sunlight and at a certain angle. But he claims they exist."

"He must be able to see a little further into the spectrum than we," said Frigate. "Obviously whoever stamped us with the sign of the beast, or whatever you want to call it, did not know about the special ability of Kazz's species. Which shows that they are not omniscient."
“Nor infallible,” said Burton. “Otherwise I would never have awakened in that place before being resurrected. So who is this person who does not have these symbols on his skin?”

“Robert Spruce,” said Frigate. “Before we jump to any conclusions,” said Monat, “don’t forget that the omission may have been an accident.”

“We’ll find out,” said Burton ominously. “But why the symbols? Why should we be marked?”

“Probably for identification or numbering purposes,” said Monat. “Let’s go face Spruce,” said Burton.

“We have to catch him first,” replied Frigate. “Kazz made the mistake of mentioning to Spruce that he knew about the symbols, at breakfast this morning. Spruce turned pale, excused himself — and he hasn’t been seen since. We’ve sent search parties out up and down the river, and also into the hills.”

“His flight is an admission of guilt,” said Burton. He felt anger and frustration rising within him. Was man a species of cattle to be branded for some sinister purpose?

That afternoon, the drums announced that Spruce had been caught.

Three hours later he was standing before the council table in the newly built meeting hall. Behind the table sat the Council. The doors were closed, for the councilmen felt that this was something that could be conducted more efficiently without a crowd. However, Monat, Kazz, and Frigate were present.

“I may as well tell you now,” said Burton, “that we have decided to go to any lengths to get the truth from you. It is against the principles of every one at this table to use torture. We despise and loathe those who resort to torture. But we feel that this is one issue when principles must be abandoned.”

“Principles must never be abandoned,” said Spruce evenly. “The end never justifies the means. Even if clinging to them means defeat, death, and remaining in ignorance.”

“There’s too much at stake,” said Targoff. “I, who have been the victim of unprincipled men; Ruach, who has been tortured several times; the others; we all agree. We’ll use fire and the knife on you if we must. It is necessary that we find out the truth.

“Now tell me, are you an agent for those responsible for this resurrection?”

“You will be no better than Goering and his kind if you torture me,” said Spruce, his voice beginning to break. “In fact you will be far worse! You are forcing yourselves to be like him in order to gain something that may not even exist — or, if it does, may not be worth the price.”

“Tell us the truth,” said Targoff. “Don’t lie. We know that you must be an agent, perhaps one of those directly responsible.”

“There is a fire blazing in that hollowed-out stone,” said Burton. “If you don’t start talking at once, you will find yourself suspended
over it within a few seconds. The roasting you get will be the least of your pain. I am an authority on Chinese and Arabic methods of torture. I assure you that they had some very refined means for extracting the truth."

Spruce, pale and sweating, said, "You may be denying yourself eternal life if you do this! It will at least set you far back on your journey, delay the final goal."

"What is that?" replied Burton.

"You have stumbled on the weakness in me and my kind," said Spruce. "We cannot endure physical violence; it is difficult for us even to think much about it. So only the strongest are sent among you — and we are weak, compared to you primitives."

"You will talk?" said Targoff.

"Even the idea of self-destruction is painful and to be avoided except when absolutely necessary," muttered Spruce. "This despite the fact that I know I shall live again."

"Put him over the fire," Targoff said to the two men who held Spruce.

"Just one moment," said Monat. "Spruce, the science of my people was much more advanced than twenty-first century Earth science. So I am more qualified to make an educated guess. Perhaps we could spare you to pain of the fire, and the pain of betraying your purpose, if you were merely to affirm what I have to say. That way you wouldn't be making a positive betrayal."

Spruce said, "Speak."

"It's my theory that you are a Terrestrial. You belong to an age chronologically far past the date of my landing on Earth. You must be the descendant of those few who survived. Judging by the technology and power required to reconstruct the surface of this planet into one vast river valley, your age must be much later than the twenty-first. Say, the 50th century A.D.?"

Spruce looked at the fire, then said, "Add two thousand more years."

"If this planet is about the size of Earth, it can hold only so many people. Where are the others? Those who were stillborn, the children who died before they were five, and those who lived after the twentieth century?"

"They are elsewhere," said Spruce. Again he glanced at the fire. Then his lips tightened.

"My own people," said Monat, "had a theory they would eventually be able to see into their past. I won't go into the details, but it was possible that past events could be visually detected and then recorded. Time travel, of course, was sheer fantasy."

"But what if your culture was able to do what we only theorized about? What if you recorded every single human being that had ever lived? Located this planet and constructed this river valley? Somewhere, maybe under the very surface of this planet, used energy-matter conversion and the recordings to recreate the bodies of the dead in the tanks? Used biological techniques to rejuvenate the bodies and to restore
limbs, eyes, and so on and also to correct any physical defeats?

"Then," continued Monat, "you made more recordings of the newly created bodies and stored them in some vast memory-tank? Destroyed the bodies? Recreated them again through means of the conductive metal which is also used to charge the grails? These could be buried beneath the ground. Thus the resurrection occurs without recourse to supernatural means.

"The big question is, why?"

"If you had it in your power to do all this, would you not think it was your ethical duty?" said Spruce.

"Yes, but I would resurrect only those worth resurrecting."

"And what if others did not accept your criteria?" said Spruce. "Do you really think you are wise enough and good enough to judge? Would you place yourself on a level with God? No, all must be given a second chance, no matter how bestial or selfish or petty or stupid. Then it will be up to them . . . ."

He fell silent, as if he regretted his outburst.

"Besides," said Monat, "you want to make a study of humanity as it existed in the past. You would want to record all the languages that man ever spoke, his mores, his philosophies, biographies. To do this, you need agents, posing as resurrectees, to mingle with the river people and to take notes, to observe, to study. How long will this study take? One thousand years? Two? Ten? A million?

"And what about the eventual disposition of us? Are we to stay here forever?"

"You will stay here as long as it take for you to be rehabilitated!" shouted Spruce. "Then, you will be relocated . . . ."

He closed his mouth, glared, then opened it to say, "Continued contact with you makes even the toughest of us take on your characteristics. We have to go through a rehabilitation ourselves. Already I feel unclean!"

"Put him over the fire," said Targoff. "We'll get the entire truth out of him."

"No, you won't" cried Spruce. "I should have done this long ago! Who knows what . . . ."

He fell to the ground, and his skin began to change to the bluish color of the dead.

Targoff gestured to Doctor Steinborg and said, "Better take him away now; begin the dissection at once. We'll wait here for your report."

"With stone knives, no chemicals, no microscopes, what kind of a report can you expect?" said Steinborg. "I'll do my best."

The body was carried off. Burton said, "I'm glad he didn't force us to admit we were bluffing. If he had kept his mouth shut, he could have defeated us."

"You really weren't going to torture him?" Frigate asked.

"Of course not," said Ruach. "Spruce would have been right. We'd have been no better than Goering. But we could have tried other
means — hypnotism, for instance. Burton, Monat, and Steinborg are experts in that field."

"The trouble is, we still don't know if we did get the truth," said Targoff. "Actually he may have been lying. Monat supplied guesses; if these were wrong, Spruce could have led us astray by agreeing with Monat. I'd say we can't be at all sure."

They agreed on one thing. Their chances of detecting another agent through the absence of symbols on the forehead would be gone. Now that They — whoever They were — knew about the visibility of the characters to Kazz's species, They would take the proper measures to prevent detection that distinguished them as different.

Steinborg returned about three hours later. "There is nothing to distinguish him from any other member of Homo Sapiens except this one little device."

He held up a black shiny ball that was about the size of a matchhead.

"I located this on the surface of the forebrain. It was attached to some nerves by wires so thin that I could see them only at a certain angle, when they caught the light. It's my opinion that Spruce killed himself by means of this device and that he did so by literally thinking himself dead. Somehow, this little ball translated a wish for death into the deed. Perhaps, it reacted to the thought by releasing a poison which I do not have facilities for analyzing." He concluded his report and passed the ball around to the others.

Thirty days later, Burton, Frigate, Ruach, and Kazz were returning from a trip upriver. It was just before dawn.

The cold heavy mists that piled up to six or seven feet above the river in the latter part of the night swirled around them. They could not see in any direction further than a strong man might make a standing broad jump. But Burton, standing in the prow of the bamboo-hulled single-masted boat, knew that they were close to the western shore. Near the relatively shallow depths the current ran more slowly, and they had just steered to port from the middle of the river.

If his calculations were correct, they should be close to the ruins of Goering's hall. At any moment he expected to see a strip of denser darkness appear out of the dark waters, the banks of that land he now called home. Home, for Burton, had always been a place from which to sally forth, a resting-place, a temporary fortress in which to write a book about his last expedition, a lair in which to heal fresh hurts, a conning tower from which he looked out for new lands to explore.

Thus, only two weeks after the death of Spruce, Burton had felt the need to get to some place other than the one in which he now was. He had heard a rumor that copper had been discovered on the western shore about a hundred miles upriver. The rumor, carried by a runaway slave, was that copper was be-
ing mined in large quantities in the mountains of the area near that which he had fled. This was a length of shore of not more than twelve miles, inhabited by 5th century B.C. Sarmatians and 13th century A.D. Frisians.

Burton had listened to the fellow, an 18th century Spanish gypsy. He did not really think the story was true — but it gave him an excuse to travel. So, turning over the management of the new state to Targoff, and ignoring Alice’s pleas to take her with him, he had set off.

Now, a month later and after some adventures, not all unpleasant, they were almost home. The gypsy’s story had not been entirely unfounded. There was copper but only in minute amounts. So the four had gotten into their boat for the easy trip downcurrent, their sail pushed by the neverceasing wind. They journeyed during the daytime and beached the boat during mealtimes wherever there were friendly people who did not mind strangers using their grailrocks. At night they either slept among the friendlies or, if in hostile waters, sailed by in the darkness.

The last leg of their trip was made after the sun went down. Before getting home, they had to pass a section of the valley where slave-hungry 18th-century Mohawks lived on one side and equally greedy Carthaginians of the third century B.C. on the other. Having slipped through under cover of the fog, they were almost home.

Burton stood on the prow and scowled against the dark gray swirls.

After a while he became aware that Frigate was standing behind him. Probably he had been there for some time, but had not spoken because he had been hurt too many times by Burton’s savage tongue when Burton had resented having his thoughts interrupted.

“Well, Pete, what is it? You have an itch you want scratched?”

“Yes, in my head,” the Yank replied. “I was wondering. Suppose Spruce was telling the truth, that we’re allowed a thousand years or so in which to pass some sort of ethical test, after which those who are successful will gain some sort of immortality? That’s all right for those who survive during the time allotted. But what about the poor bastards who were resurrected only to die a short time later? How can they prove themselves?”

“I think it’s quite obvious.”

“Sure. They’ll be resurrected again, as many times as they die in the valley. But — who has? There’s no evidence . . .”

“There have been rumors.”

“Rumors, hell! This valley has more rumors than people!”

“Then, I don’t know,” Burton said. “Did you expect to get any more answers to your questions here than you did on Earth? Anyway, if the river is as long as we think it is, a million people could die every day along its banks and be resurrected the next day, and it might be years before you or I saw it happen in our area.”

Abruptly, he said, “There’s the bank. Pete, lower the mast! Kaz, Lev, back oars! Jump to it!”
A few minutes later, they had landed and had pulled the lightweight craft completely out of the water and upon the gently sloping shore. Now that they were out of the mists they could see the sky paling above the eastern mountains. Soon the sun would be above the towering peaks to the east.

“Dead reckoning come alive!” Burton said, “We’re ten paces beyond the grailrock near the ruins!”

He scanned the bamboo huts scattered along the plain and those buildings evident in the long grasses of the hills and under the giant trees of the higher hills at the feet of the mountains.

Not a single person was to be seen. The valley was asleep.

He knew that this was not so. It had better not be so. There were sentinels on platforms in the branches of the iron trees, and the earthen walls at the north and south boundaries were manned by garrison. A half-mile away from where he stood, on each side, were slender bamboo towers, on the top of which were lookout. If they, or any of the guards along the ten-mile length of this area, saw anything suspicious, they were to pound on huge signal-drums. The entire state should then come alive; the bamboo structures on the plains and in the hills should vomit forth a horde of armed men and women.

Nevertheless, he was concerned that he and his crew had landed so easily under the cloak of the fog. An army could have slid just as successfully through the mists and even now be racing towards the nearest buildings to slaughter or capture the inhabitants.

Should he build an earthen wall along the entire shore of this area and top it with a fortress of logs? What good would it do? To make it an effective defense, the whole population would have to sleep on top of the wall every night. And a host of attackers, concentrated at several places, could pour over the wall and overcome the defenders before they could assemble their strength. No, a wall was not the answer. What then?

Perhaps there was no complete answer to this problem—or to any.

He said to the others, “Don’t you think it’s strange that no one’s up yet? Or that we’ve not been challenged by the sentinels?”

Frigate pointed toward the lookout tower to their right.

Burton swore and said, “They’re asleep, by God, or deserted their post!”

But he knew was he spoke that this was no common case of dereliction of duty. Though he had said nothing to the others about it, the moment he had stepped ashore, he had known that something was very wrong. He began running across the plain towards the hut in which he and Alice lived. Behind him thudded the feet of the others as they followed.

The entrance to the little one-room house was a curtain formed of bamboo slats tied together by dried long-grass blades. Normally it was let down at night; now it was rolled up. Seeing this, he put on a
burst of speed and ran headlong into the hut.

Alice was sleeping on the bamboo-and-grass bed on the right side of the building. Only her head was visible, for she was curled up under a blanket of towels fastened to each other by the magnetic clasps. Burton threw the blanket back, got down on his knees by the low bed, and raised her to a sitting position. Her head lolled forward, and her arms hung limply. But she had a healthy color and breathed normally.

Burton called her name three times. She slept on. He slapped both her cheeks sharply; red splotches sprang up on them. Her eyelids fluttered, then she became as before.

By then Frigate and Ruach appeared. "We've looked into some of the other huts," Frigate said. "They're all asleep. I tried to wake a couple of them up, but they're out for the count. What's wrong?"

Burton said, "There's only one person who might have the power or the need to do this. Spruce! Spruce and his kind, whoever they are!"

"Why?" Frigate said. He sounded frightened.

"They were looking for me! They must have come in under the fog, somehow put this whole area to sleep!"

"A sleep-gas would do it easily enough," Ruach said. "Although people who have powers such as theirs could have devices we've never dreamed of."

"They were looking for me!" Burton shouted.

"Which means, if true, that they may be back tonight," Frigate said. "But why would they be searching for you?"

Ruach replied for Burton. "Because he, as far as we know, was the only man to awaken in the pre-resurrection phase. Why he did is a mystery. But it's evident something went wrong. It may also be a mystery to them. I'd be inclined to think that they've been discussing this and finally decided to come here. Maybe to kidnap Burton for observation — or some more sinister purpose."

"Possibly they wanted to erase from my memory all that I'd seen in that chamber of floating bodies," Burton said. "Such a thing should not be beyond their science."

"But you've told that story to many," Frigate said. "They couldn't possibly track all those people down and remove the memory of your story from their minds."

"Would that be necessary? How many believe my tale? Sometimes I doubt it myself."

Ruach said, "Speculation is fruitless. What do we do now?"

There was a shriek, "Richard!"

And they turned to see Alice sitting up and staring at them.

For a few minutes, they could not get her to understand what had happened. Finally she said, "So that's why it didn't clear up after the rains last night! Instead, the fog seemed to roll in from the river, the first time it's ever done that. I thought it was strange, but of course I had no way of knowing what was really happening."
Burton said, "Get your grail. Put anything you want to take along in your sack. We’re leaving as of now. I want to get away before the others awake."

Alice’s already large eyes became even wider. "Where are we going?"

"Anywhere from here. I don’t like to run away, but I can’t stand up and fight people like that. Not if they know where I am. I’ll tell you, however, what I plan to do. I intend to find the end of the river. It must have an inlet and an outlet, and there must be a way for a man to get through to the source. If there’s any way at all, I’ll find it — you can bet your soul on that!

"Meanwhile, they’ll be looking for me elsewhere — I hope. The fact that they didn’t find me here makes me think that they have no means for instantly locating a person. They may have branded us like cattle —" he indicated the invisible symbols on his forehead — "but even cattle have mavericks. And we’re cattle with brains."

He turned to the three. "You’re more than welcome to come along with me. In fact, I’d be honored."

"I’ll get Monat," Kazz said. "He wouldn’t want to be left behind."

Burton grimaced and said, “Good old Monat! I hate to do this to him, but there’s no helping it. He can’t come along. He’s too distinguishable. Their agents would have no trouble at all in locating anybody who looked like him. I’m sorry, but he can’t."

Tears stood in Kazz’s eyes, then ran down his bulging cheekbones. In a choked voice, he said, “Burton-naq, I can’t go either. I look too different, too.”

Burton felt tears wet his own eyes. He said, "We’ll take that chance. After all, there must be plenty of your type around. We’ve seen at least thirty or more during our travels.”

“No females so far, Burton-naq,” Kazz said mournfully. Then he smiled. "Maybe we find one when we go along the river."

As quickly, he lost his grin. "No, damn it, I don’t go! I can’t hurt Monat too much. Him and me, others think we ugly and scary looking. So we become good friends. He’s not my naq, but he’s next to it. I stay.”

Again he smiled. "I know. I tell Monat where you’re going. Then, we wait a while and follow you. Some day we catch up and all go together. You like that? O.K.?"

He stepped up to Burton, hugged him in a grip that forced Burton’s breath out in a great whoosh, released him, shook hands with the others as they winced, then turned and shuffled off.

Ruach, holding his paralyzed hand, said, “You’re off on a fool’s errand, Burton. Do you realize that you could sail on this river for a thousand years and still be a million miles or more from the end? Not me. I’m staying. My people need me. Besides, Spruce made it clear that we should be striving for a spiritual perfection, not fighting those who gave us a chance to do so.”

Burton’s teeth flashed whitely in
his dark face. He swung his grail as if it were a weapon.

"I didn't ask to be put here any more than I asked to be born on Earth. I don't intend to kowtow to another's dictates! I mean to find the river's end. And if I don't, I will at least have had fun and learned much on the way. Let's go! Ho for the river!"

By then, those in the huts were beginning to stumble out as they yawned and rubbed heavy eyes. Ruach paid no attention to them; he watched the craft, close-hauled to the wind, cutting across and up the river. Burton was handling the rudder; he turned once and waved the grail so that the sun bounced off it in many shining spears.

Ruach thought that Burton was really happy that he had been forced to make a decision. Now he could evade the deadly responsibilities that would come with governing this little state and could do what he wanted. He could set out on his greatest of all adventures.

"I suppose it's for the best," Ruach muttered to himself. "A man may find salvation on the road, if he wants to, just as well as he may at home. It's up to him. Meanwhile I, like Voltaire's character — what was his name? Earthly things are beginning to slip me — will cultivate my own little garden."

He paused to look somewhat longingly after Burton.

"Who knows? He may some day run into Voltaire."

He sighed, then smiled slightly.

"On the other hand, Voltaire may some day drop in on me!"
FIELD WEAPONS TOMORROW

by JOSEPH WESLEY

Here's a preview of tomorrow's "limited wars" — supported by unlimited technological change!

In examining the possible weapons of the future — the near future when boys who are being born today will be entering the armed forces — it is natural first to think of the arsenal for Ragnarok. But if deterrence continues to be effective — and we can expect that it will — then the less wholesale, more everyday weapons of police action and minor battles and undeclared wars and guerrilla fighting will be of foremost importance to the young soldiers, sailors and airmen who are now being introduced to Earth.

What will they look like, these weapons of twenty years from now? Many of them, of course, will look just like those we have now, and may very well be in stockpile today.

More than one soldier has been expected to fight using weapons with an age greater than his own. As for the rest — we can guess.

Versatility, simplicity of operation and reduction in manpower requirements; these are probable goals of technology aimed toward usefulness in limited war.

One young man — call him Bill — may be worth examining in this connection. He was born this morning at five forty-three; third child, first son. His weight is seven pounds eight ounces, and like all babies, he looks a little like Alfred Hitchcock. Dressed in his red and wrinkled skin, hung up by his heels, after proper encouragement he began life squalling bloody murder.
Twenty years later to the day he, at five forty-three in the morning, is squatting on his heels at the crossing of a pair of jungle trails nearly halfway around the world from his birthplace. Now his weight is one hundred and seventy-eight pounds and he looks more like the Nineteen Eightyish equivalent of a sleepy Ricky Nelson than he does like Hitchcock. He is trying to stay alert and quiet to avoid bloody murder—his own.

Bill comes considerably better equipped than he did twenty years ago. It is this equipment—all of it much younger than he, and therefore, at this writing, still in the world of tomorrow—and how Bill uses it, that we want to examine.

Our young soldier is stationed at the jungle crossroads because an undeclared enemy has been infiltrating guerillas from across the border of a neighboring state into the territory of a backward nation we number among our friends.

The numbers of these guerillas have been reaching alarming proportions, and our government has quietly decided to try to stop the infiltration. Bill, and a thin line of young men like him, has been put in his present uncomfortable position as the direct result of that decision.

Since all civilians have long since been cleared out of the area, Bill has been told to shoot at any one who gets within range—except, of course, the man who will come to relieve him in a couple of hours, or the sergeant who may show up at a time to check on his alertness.

He is crouched in an overgrown foxhole, with an opaque camouflaged dam above him. From the outside it looks and feels like a hammock swarming with the usual low tropical vegetation that springs up in a defoliated area. From the inside, it looks dark and feels hot and stuffy. Bill’s attention is concentrated on a twelve-inch radar display looking much like a modest sized television screen. A bright line of light is painted on the face of this screen, radiating from the center and rotating upon it at a rate averaging about six times a second, following somewhat erratically the movements of an antenna that spins just a few inches above his head.

The radar display, of course is designed to show what the spinning radar antenna sees. Since the radar is rapidly scanning the entire jungle in Bill’s vicinity, and since the jungle, except for the defoliated bands bordering the trails, is as teeming with vegetable and animal life as is customary in jungles, it may seem strange that the radar display is blank.

In fact, it is functioning in accordance with the plans of its designers. This in itself is an engineering miracle not in the least appreciated by Bill, who has been brought up to expect his gadgets to work. He knows nothing of the frustrations experienced by his parents, who were confronted with the in-built unreliability of engineered products varying from electric toasters and can openers to television sets and “thinking” clothes washers on the one hand, and from sub-
marine piping to lunar exploration camera systems on the other. The technology — and especially the military technology — of 1985 is pointed primarily to provide equipment that works, and will continue to work even with the casual lack of care, that Bill and his equally lightly trained companions can be expected to bestow on it.

Second in importance is that the equipment, in working, performs its designed function well. This, Bill's radar is doing. Although the antenna is only a couple of feet square, to fit above Bill's head in the camouflage hut, the radar operates at frequencies high enough to provide good definition. The radar transmits a pseudo-noise signal that operates as would ramp-modulated CW. The frequency varies randomly over a band whose width is about ten per cent of the base frequency, and at any discrete frequency exhibits a white noise spectrum. The returning signal is correlated with that which was transmitted earlier, to determine range and, through doppler, velocity. Further correlation techniques provide a large degree of clutter discrimination.

All of the normal terrain and vegetation background seen by the radar is defined by it as clutter. It is unwanted, and its display would be confusing. The output of the radar is therefore fed into a digital computer. It would have been possible, perhaps, to radio the output of the radar in a digital code back to a massive central computer, located as far away as continental United States. It would have been feasible for the communications satellites and electronics spy satellite systems to have been programmed to pick up the information and send it on, and for the answer to have been returned in the same way. Fortunately, such a cumbersome and potentially unreliable system — due to its susceptibility to jamming, for example — is not required.

The digital computer nestles against Bill's left haunch, and is no bigger than a suitcase. The use of new ultra-micro-miniature packaging techniques has made this possible. The computer accepts the radar's output as a clutter pattern, memorizes it, and then refuses to send it back to the display screen . . . Over the first few minutes of operation after having been programmed for this type of use, it learns the normal doppler effect of branches and leaves swaying in the wind, and of water ripples in a nearby brook. It can even recognize the pattern changes brought on by gusts and by other normal wind changes, or by falling rain and water run-off on the ground, and refrain from presenting them. With all of this background canceled out, the screen is, of course, entirely blank.

As Bill stifles a yawn and rubs his eyes, a gentle chime in his ear phone returns his attention to the screen, where a small blob of light is now defining a target. Range fifteen thousand meters — at the outer edge of the range band — and azimuth zero four seven degrees true. He shifts his gaze to a rectangular screen set to the left of the
circular one, and about the same size. On this now appears an elaborate squiggle, a sort of spectrum display, showing the fine-grain structure of the radar signal returning from the target: the target signature. Above this screen, a light glows firmly green.

Bill relaxes and yawns again and then, without much interest taps a key labeled with a question mark. The computer which has already compared the target signature with its extensive library of such signatures and has therefore lighted the green light, now refers to its alphanumeric readout capability, and prints on the face of the 'scope the words "JUNGLE CAT."

"I thought so," mutters Bill. "Kitty on the prowl again. Fourth time tonight. He acts hungry—not much luck in his hunting this evening, I guess, and it's almost daylight."

He reached toward the key which would remove the presentation of this unwanted target from his 'scopes, and then shifts to depress another which erases only the target signature presentation. The blip on his plan position indicator is, after all, company of a sort. Kitty is almost an old friend.

The spot of light marking the leopard called Kitty suddenly starts to move across the face of the 'scope with surprising speed—thirty miles an hour, Bill notes—and that just radial velocity.

He steps up the gain of his radar an order of magnitude, and as several additional targets suddenly appear on the display, selects one for detailed readout just as Kitty's target pip merges with it, and again taps the key with the question mark. The computer obligingly prints out "SMALL RODENT," and then, "TARGET GONE."

"I hope you enjoy your breakfast," says Bill sotto voce, and his hand strays toward the package of field rations at his belt. He decides against eating, however. Advancing technology has done no more during these twenty years to improve field rations than it did during the previous twenty, and he prefers to wait until he is relieved and can eat a more nearly palatable meal back in camp.

At this moment a second target appears on the PPI display, from a direction almost opposite to that from which an enemy would most probably appear. After only a second of hesitation, an orange light comes on above the signature display, indicating that whatever the target may be, it has been identified as a friend, carrying a pocket transponder set to transmit the proper coded identifying signal when interrogated by radar.

"Must be Blubber Belly," Bill tells himself, referring to Sergeant Radzek. "He's always got ants in his pants." He examines the signature display for a moment, and nods in agreement with himself, then erases Kitty's symbol and restores the system gain to the normal level—the one prescribed by the Book—so that the several targets marking birds, rodents and other small jungle creatures soon remove themselves from the display.
In about fifteen minutes the concealed door at the back of the shelter dome flips open, and Sergeant Radzek slides in. Low-silhouette, electric-powered jungle crawlers such as he uses can make good time on an open trail. Only an expert could manage to get inside the already overcrowded hut and close the door behind him. Radzek, in spite of being called Blubber Belly, makes it look easy. He even manages to stay fairly well out of Bill’s way.

Bill keeps his mouth shut — the Book calls for a normal program of silence at these advanced posts, for survival’s sake — and the sergeant does the same.

For three minutes — until seventeen minutes after six — the screen remains clear, and then another target appears, closing from almost the same direction as the jungle cat half an hour earlier. This time, however, there is no firm green light. Instead, the third light above the signature display — the red ones — flickers uncertainly. Keeping his eye on the signature screen, Bill reaches for his weapon receiver. This is a device that looks a little like a gun stock, but without the barrel. It is designed for two-handed operation.

At the front is a grip for the left hand, and at the rear a trigger grip for the right. The top is horizontally grooved, as if to be fitted with a large barrel. Hooked to the stock is what Bill thinks of as the ejector cover. It looks something like an overgrown Mason jar lid, and from it trails a hose, the other end of which is connected to an air bottle. The air bottle brushes his right haunch as closely as the computer does his left. Bill unhooks this cover from the gunstock with a practiced gesture, holding it in his right hand.

Bill looks at the target signature in some perplexity. It has all of the characteristics of a crawling man to his eyes, but the computer seems less certain. The Book, however, says: “When in doubt, Shoot.” On the console beneath the display, he presses the only lighted target button — the one labelled “1”. The other nineteen are all dark. This programs the indicated target as the next one to be taken under fire. Although this seems fairly obvious, since it is the only target available, the computer wouldn’t know what to do without being told.

For safety’s stake, there is not a program within the computer for the normal automatic selection of targets; this function is left to human judgment.

At this moment the computer votes “CONFIRMED ENEMY” with a solid red light, and Bill sighs with relief. He likes for the computer to be sure of its answers.

Around the outer rim of the fox hole, and further crowding the available space, is a vertically stowed ring of tubes each about three feet long. They look to be, and are, of a design to fit the weapon stock. As Bill reaches for one of them, Radzek stirs. “Not an I. R. seeker,” he whispers. “Try a radar homer. That signature still looks a little fishy to me.”
Bill obediently selects a tube from the other side of the foxhole, and clamps his weapons stock to it, lifting it from its rack with a practiced movement, and simultaneously hooks in the roof of his camouflage dome with a swift half turn.

He then flips open a small port in the roof of his camouflage dome on the side facing toward the target, and pokes about a quarter of an inch of the muzzle of the tube through the opening. This part of the tube is non-metallic, and does not reflect radar signals.

Holding the tube about thirty degrees from the vertical, Bill moves it slowly in response to a counter-generated tone in his earphones until the device signifies its satisfaction, and then presses the trigger. A puff of air blows the missile out of the tube. Its rocket lights off well clear of the camouflaged hut, and of all vegetation. Charred leaves might easily mark a hut’s location to airborne or space surveillance vehicles, and bring back a long-range enemy missile as a visitor.

The rocket climbs up and up, several thousand meters in the air, then arches over to dive back into the jungle. As it makes its turn, its active radar seeker turns on, and it commences a search in the area designated by the computer, trying to locate a target of the prescribed characteristics. With the cost-determined simplicity of its circuits, the active radar seeker sees only a relatively simplified identification pattern; such a missile may therefore have to pause-lock on several false targets before being able to reject them, and may even lock on clutter, momentarily fooled into thinking of it as the proper target.

Normally, then, a missile of this type is expended only against a target with a favorable signal-to-noise ratio, so that the target is easily discriminated by echo size, and the chances of error are reduced. Against a man, the customary weapon in the long-range signal is easily identified, and is very difficult to hide without equipment too elaborate to be used by an infiltrator. Against this target, however, Sergeant Radzek has directed an active radar-seeker weapon, the cost of which is several times that of the infra-red passive homing weapon.

The chosen weapon, after a moment of uncertainty, selects a target that satisfies it, and bores in to detonate just above it with a lethal partial shower. There is a flash of flame and a not inconsiderable explosion, neither of which is visible, of course, to Bill and the sergeant, who squat with their heads buried in the crowded shelter.

They can clearly follow the proceedings on their radar ‘scopes, however, and in far greater detail than their eyes could have picked up. Against a target seven miles distant in dense jungle, their unaided eyes would not have been able to tell them that a blockbuster bomb had been detonated. On the signature display, they can clearly tell that their missile has found its mark. Moreover, the radar return from the residue is not that to be expected from a human corpse.
Breaking silence, “Machinery?” whispers Bill in some surprise. “That’s right,” answers the sergeant, “and it probably means plenty of trouble. That was a Tin ‘Man. Heard of them?”

Bill emits a doubtful grunt. “We got a few words about them at the briefing. Intelligence told us a little about them, and then said there was no chance the Woggles would be using them for several weeks, and then not at this part of the line. Fubar, as usual. They told us Tin Men put out a radar return like a man, except there’s no I.R. return; they’re well shielded. They program them for any one simple action—the one we saw was set up to crawl forward. The idea is, you waste several I.R. missiles trying to hit one, and that gives the Woggles a chance to figure out where you’re firing from. Once they do that, things can get warm.”

As if in answer, the “Maximum Warning” signal buzzes in Bill’s earphone, the red light snaps firmly on, the amber “LONG SCALE” light blinks, and a blip appears on the PPI ‘scope, the range being indicated as 30,000 meters.

The radar is programmed to sweep to twice the 15,000 meter range normally displayed on the ‘scope, and the computer is programmed to ignore any targets in the long-range region unless they demonstrate by large size or rapidly closing velocity that they offer special hazard. In this way, both the computer and its operator are kept from being overwhelmed by an excessive number of unimportant targets. It is for this same reason that the equipment is not habitually set to maximum sensitivity—too many field mice and similar trash would then present themselves as targets to be analyzed.

Bill grabs the stock of his weapon, swings to his left and reaches over the computer to attach to it a somewhat larger and heavier tube than those he had previously used. This time, with the Priority signal given by the computer, there is no need for him to program the target; he would have had to use manual programming to force its rejection. With his first radar-seeker missile on the way, he quickly chooses an I.R. seeker and sends that missile after the first. Then in immediate succession he launches another radar seeker, and finally an optical-head missile.

As he fires the fourth missile, a telescopic antenna extends itself above the dome, and the signature ‘scope automatically flips over to television display, showing the scene from the subminiature television camera mounted in the nose of the missile.

Although this missile, like the others, operates on an initial program loaded into it from the computer, Bill has joy-stick controls with manual override, so that he can program the search pattern of the TV camera at will, and can also command changes in the direction of travel of the missile.

This particular weapon is used as little as possible. The shelter dome is coated to present a radar return
like the adjacent jungle; the metallic antenna now extended gives a very distinctive echo, and the radio command signals for control of the missile, unlike the pseudo-noise transmissions of the radar, are very easy for the enemy to spot and pinpoint.

As the fourth missile reaches the peak of its trajectory, the T. V. camera in its nose aims itself in the direction preset by the computer just before launch, and sends back a picture of that part of the jungle where the menace is calculated to be. Bill presses a lever and the picture zooms in toward the jungle. Spotting something in the lower corner of the picture, he points the nose camera down toward it, without stopping the zoom. At maximum simplification, the target is clear: a large structure like a tank, bristling with antennas and missile launchers. It is called "Tiger," like a killer tank of a previous generation.

Bill reaches for the command controls to correct the course of the missile to a collision trajectory with that of the tank, "Not yet," says the sergeant. "Tell the computer to calculate the correction for the last possible time, and tell it not to send out the command until that last possible time. If the Woggles are using anti-missiles, that'll drive 'em ape."

"Anti-missiles or not," reports Bill after a few seconds, "they're spoofing our radar birds. Computer says both of them are off course. And there goes self-destruct one — and two. The I.R. bird is still hot, though."

"Yes, but there comes the anti-missile now," says the sergeant, his eyes on an alpha-numeric printout on the face of the PPI 'scope. (The T. V. presentation has forced word printouts to shift to the PPI display.) "At least, we're keeping the Woggles too busy to send anything back at us. I hope." While Sergeant Radzek speaks, Bill is busy pumping the last two I.R. missiles, with shaped charge warheads, into the air.

"Video is out. They're jamming it," announces Bill, as his T. V. screen becomes a shattered mass of visual noise.

The presence of video jamming on one channel automatically causes all transmitters — including the command transmitter and receiver — to shift frequency in a preselected manner, causing the video to clear momentarily, and then break up again, as the jammer again finds the frequency. The pseudo-noise radar, with its broad frequency band, is entirely unaffected.

The next transmission to the radio-commanded missile, that of the delayed correction command, is on the new frequency — the first such transmission — and remains unjammed long enough to be received by the missile, and responded to. Meanwhile, the radar shows that the enemy has succeeded in intercepting and destroying the I.R. missile.

The last-second maneuver to correct the T. V. missile apparently fools any interceptors that the enemy may have sent up against it, and all signs of his jamming energy
cut off at the instant of predicted intercept.

For safety's sake, Bill fires a second T.V. missile — only one can be controlled at a time with the limited facilities available in a forward area hut like Bill's, designed for one-man operation. The camera of this final missile shows the tank to be burning and entirely out of action.

Even while this missile is climbing into the air, Sergeant Radzuk reaches forward and presses the Emergency Recovery Alarm on the face of the control console. This sends out a coded radio signal to Headquarters in the rear. Since the antenna is already extended there is no delay between the pushing of the button and the sending of the message, which is multiplexed onto the antenna without interrupting missile control.

"Time we hauled our tails out of here," comments the sergeant unnecessarily.

Within five minutes a speedy rescue plane darts toward them from the rear. It spins up into the hover position at almost zero altitude — less than treetop height — and lowers a hook to Bill and Radzuk, while at the same time it extrudes its great high-lift helicopter vanes, to take over the lifting chore from the less powerful downward slanted jet engine exhausts.

Bill snaps his retrieval cables into the hook, and within seconds the sky crane has lifted the entire hut and its two occupants clear of the ground, leaving behind nothing but the empty hole.

Keeping low, with the hut snugly against its base, the helicopter lumbers heavily back to the rear. They have been airborne for only a few moments when the section of the jungle that they have just vacated bursts into great multiple columns of flame. A ballistic missile, equipped not with a nuclear device, but with multiple high-explosive sub-heads within its nose cone, has arrived and destroyed an area large enough to have taken care of them permanently if they had not called for help promptly enough.

Such massive missiles as these, with only high explosive in the payload, are too expensive to use without having a well pinpointed forward target. There is too great a chance of missing a forward target whose general location is only roughly known; rear area targets are well located, but hardened sites and anti-missiles make them uneconomic for use against these and other more permanent installations.

By unspoken agreement of all parties concerned — or at least, of those parties equipped with such missiles — they are not used against towns and cities. This is not the result of chivalry, or any Code of Warfare, but through fear that such behavior will result in rapid escalation of conflict into an uncontrolled all-out nuclear war. This, no "have" nation wants, and only the "have" nations possess the weapons.

As the helicopter drops the hut near the Headquarters complex, Bill smiles happily. "This has got me back more than an hour and a half early," he tells the sergeant. "The
chow line must still be open. We won’t have to eat that cold slop they always try to feed us when we get back from watch. This is our lucky day!”

All of this has been an imaginary scene about an imaginary guerrilla conflict of the future. If there is an undeclared war at that time, it may well be fought with rifles and grenades and flame throwers, and no weapons more modern than those we possess today. If, however, sufficient energy and cash and brains are expended in developing advanced weapons and techniques for such semi-warfare—as they have been expended for all-out warfare—then the scene that has just been described may err primarily by being too conservative in its predictions.

The forward line of men just illustrated required one sniper in a hut to cover about 15,000 yards of front with one hundred per cent overlap and with allowance for sufficiently random spacing to make spotting the huts difficult. With all-out effort, fewer people and wider spacing might do the job. Or, although this seems unlikely, it might even be done without the necessity of providing such foot soldiers as Bill to be sweating it out on the spot.

And then, of course, there might be peace—and no thinking about guerrilla wars at all. END

---

Coming ... Tomorrow!

If you look around your newsstand you might still find a copy of the December If, containing a first story by a new writer named Larry Niven. A number of our “firsts” have gone on to carve out promising careers, but not quite as rapidly as Mr. Niven: his second story will soon be in Galaxy, and his third—and a pretty near book-length novel, at that!—leads off our next Worlds of Tomorrow.

What’s it like? Well, it’s the story of an alien who comes to Earth—and of what talking to dolphins can lead to—and of the problems involved in telepathy—and—No, that’s enough; if what World of Ptaavv is about could have been expressed in a few words, Larry Niven would have written it that way in the first place.

There is only one other thing to say about Worlds of Ptaavv, and that is that—in an issue packed with writers as well known as Brian W. Aldiss, Lloyd Biggle, Jr., R. S. Richardson and others—it is this novel by Larry Niven that we’re telling you about here. We think you’ll enjoy it!
RETREAT SYNDROME

by PHILLIP K. DICK

He had forgotten what was true. The things he remembered, though — were they all utterly false?

Illustrated by MORROW

I

Peace officer Caleb Myers picked up the fast-moving surface vehicle on his radarscope and saw at once that its operator had managed to remove the governor. The vehicle, at one-sixty miles per hour, had exceeded its legal capacity. Hence, he knew, the operator came from the Blue Class, engineers and technicians capable of tinkering with their wheels. Arrest would therefore be a tricky matter.

By radio Myers contacted a police vessel ten miles north along the freeway. “Shoot its power supply out as it passes you,” he suggested to his brother officer. “It’s going too fast to block, right?”

At three-ten a.m. the vehicle was stopped. Powerless, it had coasted to a halt on the freeway shoulder. Officer Myers pressed buttons, flew leisurely north until he spotted the helpless wheel, plus the red-lit po-
lice wheel making its way through heavy traffic toward it. He landed at the exact instant that his com-
patriot arrived on the scene.

Together, wary, they walked to the stalled wheel, gravel crunching under their boots.

In the wheel sat a slim man wearing a white shirt and tie. He stared straight ahead with a dazed expression, making no move to greet the two gray-clad officers with their laser rifles, anti-pellet bubbles protecting their bodies from thigh to cranium. Myers opened the door of the wheel and glanced in, while his fellow officer stood with rifle in hand, just in case this was another come-on. Five men from the San Francisco local office had been killed this week alone.

“You know,” Myers said to the silent driver, “that it’s a mandatory two-year suspension of license if you tamper with your wheel’s speed governor. Was it worth it?”
After a pause the driver turned his head and said, "I'm sick."
"Psychically? Or physically?" Myers touched the emergency button at his throat, making contact with line 3, to San Francisco General Hospital. He could have an ambulance here in five minutes if necessary.

The driver said huskily, "Everything seemed unreal to me. I thought if I drove fast enough I could reach some place where it's — solid." He put his hand gropingly against the dashboard of his wheel, as if not really believing the heavily-padded surface was there.

"Let me look in your throat, sir." Myers said, and shone his flashlight in the driver's face. He turned the jaw upward, peered down past well-cared-for teeth as the man reflexively opened his mouth.

"See it?" his fellow officer asked.
"Yes." He had caught the glint.

The anti-carcinoma unit, installed in the throat.

Like most non-Terrans this man was cancer phobic. Probably he had spent most of his life on a colony world, breathing pure air, the artificial atmosphere installed by automatic reconstruct equipment prior to human habitation. So the phobia was easy to understand.

"I have a full-time doctor." The driver reached now into his pocket, brought out his wallet; from it he extracted a card. His hand shook as he passed the card to Myers.
"Specialist in psychosomatic medicine, in San Jose. Any way you could take me there?"

"You're not sick," Myers said. "You just haven't fully adjusted to Earth, to this gravity and atmosphere and milieu factors. It's three-fifteen in the morning. This Dr. Hagopian or whatever his name is can't see you now." He studied the card. It informed him:

This man is under medical care. Should any bizarre behavior be exhibited obtain medical help at once.

"Earth doctors," his fellow officer said, "don't see patients after hours. You'll have to learn that, Mr. —"
He held out his hand. "Let me see your operator's license, please."

The entire wallet was reflexively passed to him.

"Go home," Myers said to the man. His name, according to the license, was John Cupertino. "You have a wife? Maybe she can pick you up. We'll take you into the city . . . better leave your wheel here and not try to drive any more tonight. About your speed —"

Cupertino said, "I'm not used to an arbitrary maximum. Ganymede has no traffic problem; we travel in the two and two-fifties." His voice had an oddly flat quality. Myers thought at once of drugs, in particular of thalamic stimulants; Cupertino was hag-ridden with impatience. That might explain his removal of the official speed regulator, a rather easy job for a man accustomed to machinery. And yet —

There was more. From twenty years experience Myers intuited it.

Reaching out he opened the glove compartment, flashed his light
in. Letters, an AAA book of approved motels . . .

"You don't really believe you're on Earth, do you, Mr. Cupertino?" Myers said. He studied the man's face; it was devoid of affect. "You're another one of those bippity-bop addicts who thinks this is a drug-induced guilt-fantasy . . . and you're really home on Ganymede, sitting in the living room of your twenty-room demesne—surrounded no doubt by your autonomic servants, right?" He laughed sharply, then turned to his fellow officer. "It grows wild on Ganymede," he explained. "The stuff. Frohedadrine, the extract's called. They grind up the dried stalks, make a mash out of it, boil it, drain it, filter it and then roll it up and smoke it. And when they're all done—"

"I've never taken Frohedadrine," John Cupertino said remotely, staring straight ahead. "I know I'm on Earth. But there's something wrong with me. Look." Reaching out, he put his hand through the heavily-padded dashboard. Officer Myers saw the hand disappear up to the wrist.

"You see? It's all insubstantial around me, like shadows. Both of you. I can banish you by just removing my attention from you. I think I can, anyhow. But — I don't want to!" His voice grated with anguish. "I want you to be real! I want all of this to be real, including Dr. Hagopian."

Officer Myers switched his throat-transmitter to line 2 and said, "Put me through to a Dr. Hagopian in San Jose. This is an emergency; never mind his answering service."

The line clicked as the circuit was established.

Glancing at his fellow officer Myers said, "You saw it. You saw him put his hand through the dashboard. Maybe he can banish us."

He did not particularly feel like testing it out. He felt confused. He wished now that he had let Cupertino speed on along the freeway, to oblivion if necessary. To wherever he wanted.

"I know why all this is," Cupertino said, half to himself. He got out cigarettes and lit up. His hand was less shaky now. "It's because of the death of Carol, my wife."

Neither officer contradicted him; they kept quiet and waited for the call to Dr. Hagopian to be put through.

II

His trousers on over his pajamas, and wearing a jacket buttoned to keep him warm in the night chill, Gottlieb Hagopian met his patient Mr. Cupertino at his otherwise closed-up office in downtown San Jose. Dr. Hagopian switched on lights, then the heat, arranged a chair and wondered how he looked to his patient with his hair sticking in all directions.

"Sorry to get you up," Cupertino said. But he did not sound sorry. He seemed perfectly wide-awake, here at four in the morning. He sat smoking with his legs crossed, and Dr. Hagopian, cursing and groaning to himself in futile complaint, went to the back room to plug in the
coffee-maker. At least he could have 
that.

"The police officers," Hagopian 
said, "thought you might have taken 
some stimulants, by your behavior. 
We know better." Cupertino was, 
as he well knew, always this way. 
The man was slightly manic.

"I never should have killed Car-
ol," Cupertino said. "It's never been 
the same since then."

"You miss her right now? Yester-
day when you saw me you said —"

"That was in broad daylight. I 
always feel confident when the sun's 
up. By the way — I've retained an 
attorney. Name's Phil Wolfson."

"Why?" No litigation was pend-
ing against Cupertino; they both 
 knew that.

"I need professional advice. In 
addition to yours. I'm not criticizing 
you, doctor; don't take it as an 
insult. But there're aspects to my 
situation which are more legal than 
medical. Conscience is an interest-
ing phenomenon. It lies partly in 
the psychological realm, partly —"

"Coffee?"

"Lord no. It sets the vagus nerve 
off for four hours."

Dr. Hagopian said, "Did you 
tell the police officers about Carol? 
About your killing her?"

"I just said that she was dead. I 
was careful."

"You weren't careful when you 
drove at one-sixty. There was a 
case in the Chronicle today on the 
Bayshore Freeway. The State High-
way Patrol went ahead and dis-
integrated a car that was going one-
fifty. And it was legal. Public safe-
ty, the lives of —"

"They warned it," Cupertino 
pointed out. He did not seem per-
turbed; in fact, he had become 
even more tranquil. "It refused to 
stop. A drunk."

Dr. Hagopian said, "You realize, 
of course, that Carol is still alive. 
That in fact she's living here on 
Earth, in Los Angeles."

"Of course." Cupertino nodded ir-
ritably. Why did Hagopian have to 
belabor the obvious? They had dis-
cussed it countless times, and no 
doubt the psychiatrist was going to 
ask him the old query once again: 
how could you have killed her 
when you know she's alive? He felt 
weary and irritable; the session with 
Hagopian was getting him nowhere.

Taking a pad of paper Dr. Hago-
pian wrote swiftly, then tore off the 
sheet and held it toward Cupertino.

"A prescription?" Cupertino ac-
cepted it warily.

"No. An address."

Glancing at it Cupertino saw 
that it was an address in South 
Pasadena. No doubt it was Carol's 
address.

He glared at it in wrath.

"I'm going to try this," Dr. Hago-
pian said. "I want you to go there 
and see her face to face. Then 
we'll —"

"Tell the board of directors of 
Six-planet Educational Enterprises 
to see her! Not me," Cupertino said, 
handing the piece of paper back. 
"They're responsible for the entire 
tragedy. Because of them I had to 
do it. And you know that, so don't 
look at me that way. It was their 
plan that had to be kept secret, isn't 
that so?"
Dr. Hagopian sighed. "At four in the morning everything seems confused. The whole world seems ominous. I'm aware that you were employed by Six-planet at the time, on Ganymede. But the moral responsibility —" He broke off. "This is difficult to say, Mr. Cupertino. You pulled the trigger on the laser beam, so you have to take final moral responsibility."

"Carol was going to tell the local homeopapes that there was about to be an uprising to free Ganymede — and that the bourgeoisie authority on Ganymede, consisting in the main of Six-planet, was involved. I told her not to. We couldn't afford to have her say anything. She did it for petty, spiteful motives, for hatred of me; nothing to do with the actual issues involved. Like all women she was motivated by personal vanity and wounded pride."

"Go to that address in South Pasadena," Dr. Hagopian urged. "See Carol. Convince yourself that you never killed her, that what happened on Ganymede that day three years ago was a —" He gestured, trying to find the right words.

"Yes, doctor," Cupertino said cuttingly. "Just what was it? Because that day — or rather that night — I got Carol right above the eyes with that laser beam. Right in the frontal lobe. She was absolutely, unmistakably dead before I left the conapt and got out of there, got to the spaceport and found an interplan ship to take me to Earth."

He waited. It was going to be hard on Hagopian, finding the right words. It would take time.

After a pause Hagopian admitted, "Yes, your memory is detailed. It's all in my file and I see no use in your repeating it — I frankly find it unpleasant at this hour of the morning. I don't know why the memory is there. I know it's false, though, because I've met your wife, talked to her, carried on a correspondence with her, all subsequent to the time on Ganymede when you remember killing her. I know that much, at least."

Cupertino said, "Give me one good reason for looking her up."

He made a motion to tear the slip of paper in half.

"One?" Dr. Hagopian pondered. He looked gray and tired. "Yes, I can give you a good reason, but it's one you'll reject."

"Try me."

Dr. Hagopian said, "Carol was present that night on Ganymede, the night you recall killing her. Maybe she can tell you how you obtained the false memory of the killing."

III

At six in the morning Cupertino stood at Carol Holt Cupertino's door.

Many rings of the bell were required until at last the door of the small, single-unit dwelling opened. Carol, wearing a blue, pellucid nylon nightgown and white furry slippers, stood sleepily facing him. A cat hurried out past her.

"Remember me?" Cupertino said, stepping aside for the cat.

"Oh, God." She brushed the tum-
ble of blonde hair back from her eyes and nodded. "What time is it?" Gray, cold light filled the almost deserted street. Carol shivered and folded her arms. "How come you’re up so early? You never used to be out of bed before eight."

"I haven't gone to bed yet." He stepped past her into the dark living room with its drawn shades. "How about some coffee?"

"Sure." Listlessly she made her way to the kitchen and pressed the hot coffee button on the stove. First one, then a second cup appeared, giving off fragrant steam. "Cream for me," she said, "cream and sugar for you. You're more infantile." She handed him his cup. The smell of her — warmth and softness and sleep — mixed with that of the coffee.

Cupertino said, "You haven’t gotten a day older and it’s been well over three years." In fact she was even more slender, more supple.

Seating herself at the kitchen table, her arms still modestly folded, Carol said, "Is that suspicious?" Her cheeks were flushed, her eyes bright.

"No. A compliment." He, too, seated himself. "Hagopian sent me here. He decided I should see you. Evidently you’ve seen him."

"Yes," Carol said, "I've seen him. I was in Northern California several times on business. I stopped by. He had asked me to in a letter. I liked him. In fact, you should be about cured by now."

"Cured?" He shrugged. "I feel I am. Except —"

"Except that you still have your idée fixe. Your basic, delusional, fixed idea that no amount of psychoanalysis will help. Right?"

Cupertino said, "If you mean my recollection of killing you, yes. I still have it. I know it happened. Dr. Hagopian thought you could tell me something about it; after all, as he pointed out —"

"Yes," she agreed, "but is it really worth going over this with you? It's so tedious and, my God, it's only six a.m. Couldn't I go back to bed and then sometime later get together with you, maybe in the evening? No?" She sighed. "Okay. Well, you tried to kill me. You did have a laser beam. It was at our conapt in New Detroit-G, on Ganymede, on March 12, 2014."

"Why did I try to kill you?"

"You know," she said bitterly. "Yes." In all his thirty-five years he had never made another mistake as serious. In their divorce litigation his wife's knowledge of the impending revolt had given her the dominant position; she had been able to dictate settlement terms to him precisely as she wished. At last the financial components had proved unbearable and he had gone to the conapt which they had shared. By then he had moved out, gotten a small conapt of his own at the other end of the city. He had told her simply and truthfully that he could not meet her demands. And so the threat by Carol to go to the homeopapes, the news-gathering extendors of the New York Times and Herald Tribune which operated on Ganymede.

"You got out your little laser
beam," Carol was saying, "and you sat fooling with it, not saying much. But you got your message over to me. Either I accepted an unfair settlement or —"

"Did I fire the beam?"
"Yes."
"And hit you?"
Carol said, "You missed. I ran out of the conapt and down the hall to the elevator. I got downstairs to the sergeant-at-arms' room on floor one and called the police from there. They came. They found you still in the conapt." Her tone was withering. "You were crying."

"Christ," Cupertino said. Neither of them spoke for a time. They both drank their coffee. Across from him his wife's pale hand shook and her cup clinked against its saucer.
Carol said matter-of-factly, "Naturally, I went ahead with the divorce."

"Dr. Hagopian thought you might know why I remember killing you that night. He said you hinted at it in a letter."

Her blue eyes glittered. "That night you had no false memory. You knew you had failed. Amboyn-
ton, the district attorney, gave you a choice between accepting mandatory psychiatric help or having formal charges filed of attempted first-degree murder. You took the former — naturally. So you've been see-
ing Dr. Hagopian. The false memory — I can tell you exactly when that set in. You visited your em-
ployer, Six-planet Educational Enterprises; you saw their psychologist, a Dr. Edgar Green, attached to their personnel department. That was shortly before you left Ganymede and came here to Terra." Rising she went to refill her cup. "I pre-
sume Dr. Green saw to the im-
planting of the false memory of your having killed me."

Cupertino said, "But why?"
"They knew you had told me of the plans for the uprising. You were supposed to commit suicide from remorse and grief, but instead you booked passage to Terra, as you had agreed with Amboynton. As a mat-
ter of fact you did attempt suicide during the trip... but you must remember this?"

"Go on and say it." He had no memory of a suicide attempt.

"I'll show you the clipping from the homeopape. I kept it." Carol left the kitchen; her voice came from the bedroom. "Out of misguided sentimentality. 'Passenger on inter-
plan ship seized as—'" Her voice broke off and there was silence.

Sipping his coffee Cupertino sat wait-
ing, knowing that she would find no such newspaper clipping. Because there had been no such attempt.

C

Carol returned to the kitchen, a puzzled expression on her face. "I can't locate it. But I know it was in my copy of War and Peace, in volume one. I was using it as a bookmark." She looked embarrass-
ed.

Cupertino said, "I'm not the only one who has a false memory. If that's what it is."

He felt, for the first time in over three years, that he was at last making progress.
But the direction of that progress was obscured. At least so far.

“I don’t understand,” Carol said. “Something’s wrong.”

While he waited in the kitchen, Carol dressed in the bedroom. At last she emerged, wearing a green sweater, skirt, heels. Combing her hair she halted at the stove and pressed the buttons for toast and two soft-boiled eggs.

It was now almost seven. The light in the street outside was no longer gray but a faint gold. And more traffic moved; he heard the reassuring sound of commercial vehicles and private commutes.

“How did you manage to capture this single-unit dwelling?” he asked. “Isn’t it impossible in the Los Angeles area as in the Bay Area to get anything but a compact in a high-riser?”

“Through my employers.”

“What’s your employer?” He felt at once cautious and disturbed; obviously they had influence. His wife had gone up in the world.

“Falling Star Associates.”

He had never heard of them. Puzzled, he said, “Do they operate beyond Terra?” Surely if they were interplan—

“It’s a holding company. I’m a consultant to the chairman of the board; I do marketing research.” She added, “Your old employers, Six-planet Educational Enterprises, belongs to us. We own controlling stock. Not that it matters. It’s just a coincidence.”

She ate breakfast, offering him nothing. Evidently it did not even occur to her. Moodily he watched the familiar dainty movements of her cutlery. She was still ennobled by petite bourgeois gentility; that had not changed. In fact she was more refined, more feminine than ever.

“I think,” Cupertino said, “that I understand this.”

“Pardon?” She glanced up, her blue eyes fixed on him intently. “Understand what, Johnny?”

Cupertino said, “About you. Your presence. You’re obviously quite real — as real as everything else. As real as the city of Pasadena, as this table.” He rapped with brusque force on the plastic surface of the kitchen table. “As real as Dr. Hapopian or the two police who stopped me earlier this morning.” He added, “But how real is that? I think we have the central question there. It would explain my sensation of passing my hands through matter, through the dashboard of my wheel, as I did. That very unpleasant sensation that nothing around me was substantial, that I inhabited a world of shadows.”

Staring at him, Carol suddenly laughed. Then continued eating.

“Possibly,” Cupertino said, “I’m in a prison on Ganymede, or in a psychiatric hospital there. Because of my criminal act. And I’ve begun, during these last years since your death, to inhabit a fantasy world.”

“Oh, God!” Carol said, and shook her head. “I don’t know whether to laugh or feel sorry. It’s just too—” she gestured — “too pathetic. I really feel sorry for you, Johnny. Rather than give up your delusional idea you’d actually prefer to believe that all Terra is a product of your own mind, everyone and everything. Lis-
ten—don’t you agree it’d be more economical to give up the fixed idea? Just abandon the idea that you killed me—"

The phone rang.

“Pardon me.” Carol hastily wiped her mouth, rose to go and answer it. Cupertino remained where he was, gloomily playing with a flake of toast which had fallen from her plate. The butter on it stained his finger. He licked it away reflexively, then realized that he was gnawingly hungry; it was time for his own breakfast. He went to the stove to press buttons for himself, in Carol’s absence. Presently he had bacon, scrambled eggs, toast and hot coffee before him.

But how can I live? he asked himself. How do I gain sustenance if this is a delusional world?

I must be eating a genuine meal, he decided. I guess it is provided by the hospital or prison. A meal exists and I am actually consuming it. A room exists, walls and a floor . . . but not this room. Not these walls nor this floor.

And—people exist.

But not this woman. Not Carol Holt Cupertino. Someone else. An impersonal jailer or attendant. And a doctor. Perhaps, he decided, Dr. Hagopian.

That much is so, Cupertino said to himself. Dr. Hagopian is really my psychiatrist.

Carol returned to the kitchen, re-seated herself at her now cold plate. "You talk to him. It’s Hagopian."

At once he went to the phone.

On the small vidscreen Dr. Hagopian’s image looked taut and drawn. "I see you got there, John. Well? What took place?"

Cupertino said, "Where are we, Hagopian?"

Frowning, the psychiatrist said, "I don’t—"

"We’re both on Ganymede, aren’t we?"

Hagopian said, "I’m in San Jose. You’re in Los Angeles."

"I think I know how to test my theory," Cupertino said. "I’m going to discontinue treatment with you. If I’m a prisoner on Ganymede I won’t be able to, but if I’m a free citizen on Terra as you maintain—"

"You’re on Terra," Hagopian said, "but you’re not a free citizen. Because of your attempt on your wife’s life you’re obliged to accept regular psychotherapy through me. You know that. What did Carol tell you? Could she shed any light on the events of that night?"

"I would say so," Cupertino said. "I learned that she’s employed by the parent company of Six-planet Enterprises. That alone makes my trip down here worthwhile. I must have found out about her, that she was employed by Six-planet to ride herd over me."

"P-pardon?" Hagopian blinked.

"A watchdog, to see that I remained loyal. They must have feared I was going to leak details of the planned uprising to the Terran authorities. So they assigned Carol to watch me. I told her the plans and to them that proved I was unreliable. So Carol probably received instructions to kill me. She probably made an attempt and failed, so I
killed her in self-defense. And of course the uprising failed, and everyone connected with it was punished by the Terran authorities. Carol escaped because she wasn’t officially listed as an employee of Six-planet.

“Wait,” Dr. Hagopian said. “It does sound somewhat plausible. But—” He raised his hand. “Mr. Cupertino, the uprising was successful. That’s a matter of historic fact. Three years ago Ganymede, Io and Callisto simultaneously threw off Terra and became self-governing, independent moons. Every child in school beyond the third grade knows that. It was the so-called Tri-Lunar War of 2014. You and I have never discussed it but I assumed you were as aware of it as—” he gestured—“well, as of any other historic reality.”

Turning from the telephone to Carol, John Cupertino said, “Is that so?”

“Of course,” Carol said. “Is that part of your delusional system, too, that your little revolt failed?” She smiled. “You worked eight years for it, for one of the major economic cartels masterminding and financing it. And then for some occult reason you choose to ignore its success. I really pity you, Johnny.”

Cupertino said, “There must be a reason why I don’t know that. Why they decided to keep me from knowing that.” Bewildered, he reached out his hand . . .

Trembling, his hand passed into the vidphone screen and disappeared.

He drew it back at once. His hand reappeared, but he had seen it go. He had perceived and understood. The illusion was good—but not quite good enough. It simply was not perfect. It had its limitations.

“Dr. Hagopian,” he said to the miniature image on the vidscreen, “I don’t think I’ll continue seeing you. As of this morning you’re fired. Bill me at my home, and thank you very much.” He reached to cut the connection.

“You can’t!” Hagopian said instantly. “As I said, it’s mandatory. You must face it, Cupertino. Otherwise you’ll have to go up before the court once more, and I know you don’t want to do that. Please believe me that it would be bad for you.”

Cupertino cut the connection and the screen died.

“He’s right, you know,” Carol said from the kitchen.

“He’s lying,” Cupertino said. Slowly he walked back to seat himself across from her and resume eating his own breakfast.

IV

When he returned to his own conapt in Berkeley he put in a long distance vidcall to Dr. Edgar Green at Six-planet Educational Enterprises on Ganymede. Within half an hour he had his party.

“Do you remember me, Dr. Green?” he asked as he faced the image. To him the rather plump, middle-aged face opposite him was unfamiliar. He did not believe he had ever seen the man before in his life. However, at least one fundamental reality-configuration had
borne the test. There was a Dr. Edgar Green in Six-planet's personnel department; Carol had been telling the truth to that extent.

"I have seen you before," Dr. Green said, "but I'm sorry to say that the name does not come to mind, sir."

"John Cupertino, now of Terra. Formerly of Ganymede. I was involved in a rather sensational piece of litigation slightly over three years ago, somewhat before Ganymede's revolt. I was accused of murdering my wife, Carol. Does that help you, doctor?"

"Hmm," Dr. Green said frowning. He raised an eyebrow. "Were you acquitted, Mr. Cupertino?"

Hesitating, Cupertino said, "I—currently am under psychiatric care, here in the Bay Area of California. If that's any help."

"I presume you're saying that you were declared legally insane and therefore could not stand trial."

Cupertino nodded cautiously.

Dr. Green said, "It may be that I talked to you. Very dimly it rings a bell. But I see so many people... were you employed here?"

"Yes," Cupertino said.

"What specifically did you want from me, Mr. Cupertino? Obviously you want something; you've placed a rather expensive long distance call. I suggest for practical purposes—your pocketbook in particular—you get to the point."

"I'd like you to forward my case history," Cupertino said. "To me, not to my psychiatrist. Can that be arranged?"

"You want it for what purpose, Mr. Cupertino? For securing employment?"

Cupertino, taking a deep breath said, "No, doctor. So that I can be absolutely certain what psychiatric techniques were used in my case by you and by members of your medical staff working under you. I have reason to believe I underwent major corrective therapy with you. Am I entitled to know that, doctor? It would seem to me that I am." He waited, thinking, I have about one chance in a thousand of prying anything of worth out of this man.

But it was worth the try.

Corrective therapy? You must be confused, Mr. Cupertino. We do not shy from testing, profile analysis—we don't do therapy here. Our concern is merely to analyze the job-applicant in order to—"

"Dr. Green," Cupertino said, "were you personally involved in the revolt of three years ago?"

Green shrugged. "We all were. Everyone on Ganymede was filled with patriotism." His voice was bland.

"To protect that revolt," Cupertino said, "would you have implanted a delusional idea in my mind for the purpose of—"

"I'm sorry," Green interrupted. "It's obvious that you're psychotic. There's no point in your wasting your money on this call; I'm surprised that they permitted you access to an outside vid-line."

"But such an idea can be implanted," Cupertino persisted. "It is possible, by current psychiatric techniques. You admit that."

Dr. Green sighed. "Yes, Mr. Cu-
pertino. It’s been possible ever since the mid-twentieth century. Such techniques were initially developed by the Pavlov Institute in Moscow as early as 1940 and perfected by the time of the Korean War. A man can be made to believe anything."

"Then Carol could be right." He did not know if he were disappointed or elated. It would mean, he realized, that he was not a murderer; that was the cardinal point. Carol was alive, and his experience with Terra, with its people, cities and objects, was genuine. And yet — "If I came to Ganymede," he said suddenly, "could I see my file? Obviously if I’m well enough to make the trip I’m not psychotic under mandatory psychiatric care. I may be sick, doctor, but I’m not that sick." He waited; it was a slim chance, but worth trying.

"Well," Dr. Green said, pondering, "there is no company rule which precludes an ex-employee examining his personnel file. I suppose I could open it to you. However, I’d prefer to check with your psychiatrist first. Would you give me his name, please? And if he agrees I’ll save you a trip. I’ll have it put on the vidwires and in your hands by tonight."

He gave Dr. Green the name of Dr. Hagopian, and then hung up. What would Hagopian say? An interesting question and one he could not answer; he had no idea which way Hagopian would jump.

But by nightfall he would know, that much was certain.

He had an intuition that Hagopian would agree. But for the wrong reasons.

However, Hagopian’s motives were not important. All that he cared about was the file. Getting his hands on it, reading it and finding out if Carol were right.

It was two hours later — actually an incredibly long time — that it came to him, all at once, that Six-planet Educational Enterprises could, with no difficulty whatsoever, tamper with the file. They could omit the pertinent information and transmit to Earth, a spurious, worthless document.

Then what did he do next?

It was a good question — and one which he could not answer.

That evening the file from Ganymede was delivered by Western Union messenger to his conapt. He tipped the messenger, seated himself in his living room and opened the file.

It took him only a few moments to certify the fact which he had suspected: the file contained no references to any implantation of a delusional idea.

Either the file had been reconstructed or Carol was mistaken. Mistaken — or lying. In any case the file told him nothing.

He phoned the University of California. After being switched from station to station, he wound up with someone who seemed to know what he was talking about. "I want an analysis," Cupertino explained, "of a written document, to find out how recently it was transcribed. This is a Western Union wire copy so you’ll
have to go on word anachronisms alone. I want to find out if the material was developed three years ago or more recently. Do you think you can analyze for so slight a factor?"

"There's been very little word-change in the past three years," the university philologist said. "But we can try. How soon do you have to have the document back?"

"As soon as possible," Cupertino said.

He called for a building messenger to take the file to the university, and then he took time to ponder another element in the situation.

If his experience of Terra was delusional, the moment at which his perceptions most closely approximated reality occurred during his sessions with Dr. Hagopian. Hence if he were ever to break through the delusional system and perceive actual reality it would most likely take place then. His maximum efforts should be directed at that time. Because one fact seemed clearly established: he really was seeing Dr. Hagopian.

He went to the phone and started to dial Hagopian's number. Last night, after the arrest, Hagopian had helped him. It was unusually soon to be seeing the doctor again, but — he dialed.

Then something came to him.

The arrest. All at once he remembered what the policeman had said. He had accused Cupertino of being a user of the Ganymede drug Frohedadrine. And for good reason: he showed the symptoms.

Perhaps that was the modus operandi by which the delusional system was maintained. Perhaps he was being given Frohedadrine in small regular doses, perhaps in his food.

But wasn't that a paranoid — in other words, psychotic — concept?

And yet, paranoid or not, it made sense.

What he needed was a blood fraction test. The presence of the drug would register in such a test. All he had to do was show up at the clinic of his firm in Oakland and ask for the test on the grounds that he had a suspected toxemia. Within an hour the test would be completed.

And, if he were on Frohedadrine, it would prove that he was correct; he was still on Ganymede, not on Terra. And all that he experienced — or seemed to experience — was a delusion, with the possible exception of his regular, mandatory visits to the psychiatrist.

Obviously he should have the blood fraction test made at once.

Yet he shrank from it. Why? Now he had the means by which to make a possible absolute analysis, and yet he held back.

Did he not want to know the truth?

Certainly he had to have the test made. He forgot temporarily the notion of seeing Dr. Hagopian, went to the bathroom to shave, then put on a clean shirt and tie and left the conapt, starting toward his parked wheel. In fifteen minutes he would be at his employer's clinic.

His employer. He halted, his hand touching the door-handle of his wheel, feeling foolish.
They had slipped up somehow in their presentation of his delusional system. Because he did not know where he worked.

A major segment of the system simply was not there.

Returning to his conapt he dialed Dr. Hagopian.

Rather sourly, Dr. Hagopian said, "Good evening, John. I see you’re back in your own conapt; you didn’t stay in Los Angeles long."

Cupertino said huskily, "Doctor, I don’t know where I work. Obviously something’s gone wrong. I must have known formerly — up until today, in fact. Haven’t I been going to work four days a week like everyone else?"

"Of course," Hagopian said, unruffled. "You’re employed by an Oakland firm, Triplan Industries, Incorporated, on San Pablo Avenue near Twenty-first Street. Look up the exact address in your phone book. But — I’d say go to bed and rest. You were up all last night and it seems obvious that you’re suffering a fatigue reaction."

"Suppose," Cupertino said, "greater and greater sections of the delusional system begin to slip. It won’t be very pleasant for me." The one missing element terrified him. It was as if a piece of himself had dissolved. Not to know where he worked — in an instant he was set apart from all other humans, thoroughly isolated. And how much else could he forget? Perhaps it was the fatigue; Hagopian might be right. He was, after all, too old to stay up all night. It was not as it had been a decade ago when such things were physically possible for both him and Carol.

He wanted, he realized, to hang onto the delusional system. He did not wish to see it decompose around him. A person was his world; without it he did not exist.

"Doctor," he said, "may I see you this evening?"

"But you just saw me," Dr. Hagopian pointed out. "There’s no reason for another appointment so soon. Wait until later in the week, and in the meantime—"

"I think I understand how the delusional system is maintained," Cupertino said. "Through daily doses of Frohedadrine, administered orally, in my food. Perhaps by going to Los Angeles I missed a dose; that might explain why a segment of the system collapsed. Or else, as you say, it’s fatigue. In any case this proves that I’m correct. This is a delusional system, and I don’t need either the blood fraction test or the University of California to confirm it. Carol is dead — and you know it. You’re my psychiatrist on Ganymede and I’m in custody, as I have been now for three years. Isn’t that actually the case?" He waited, but Hagopian’s face remained impassive. "I never was in Los Angeles," Cupertino said. "In fact I’m probably confined to a relatively small area. I have no freedom of motion as it would appear. And I didn’t see Carol this morning, did I?"

Hagopian said slowly, "What do you mean, ‘blood fraction test’?"
What gave you the idea of asking for that?” He smiled faintly. “If this is a delusional system, John, the blood fraction test would be illusory, too. So how could it help?”

He had not thought of that. Stunned, he remained silent, unable to answer.

“And that file which you asked Dr. Green for,” Hagopian said. “Which you received and then transferred to the University of California for analysis. That would be delusional, too. So how can the result of their tests—”

Cupertino said, “There’s no way you could know of that, doctor. You conceivably might know that I talked to Dr. Green, asked for and received the file; Green might have talked to you. But not my request for analysis by the university. You couldn’t possibly know that. I’m sorry, doctor, but by a contradiction of internal logic this structure has proved itself unreal. You know too much about me. And I think I know what final, absolute test I can apply to confirm my reasoning.”

“What test?” Hagopian’s tone was cold.

Cupertino said, “Go back to Los Angeles and kill Carol once more.”

“Good God, how would that prove anything?”

“A woman who has been dead for three years can’t die again,” Cupertino said. “Obviously it’ll prove impossible to kill her.” He started to break the phone connection.

“Wait,” Hagopian said rapidly. “Look, Cupertino! I’ve got to contact the police now — you’ve forced me to. I can’t let you go down there and murder that woman for the—” He broke off. “Make a second try, I mean, on her life. All right, Cupertino; I’ll admit several things which have been concealed from you. To an extent you’re right. You are on Ganymede, not on Terra.”

“I see,” Cupertino said, and did not break the circuit.

“But Carol is real,” Dr. Hagopian continued. He was perspiring now. Obviously afraid that Cupertino would ring off he said, almost stammering, “She’s as real as you or I. You tried to kill her and failed. She informed the homeopapers about the intended revolt — and because of it that revolt was not completely successful. We here on Ganymede are surrounded by a cordon of Terran military ships. We’re cut off from the rest of the Sol System, living on emergency rations and being pushed back, but still holding out.”

“Why my delusional system?” He felt cold fright rise up inside him; unable to stifle it he felt it enter his chest, invade his heart. “Who imposed it on me?”

“No one imposed it on you. It was a self-induced retreat syndrome due to your sense of guilt. Because, Cupertino, it was your fault that the revolt was detected! Your telling Carol was the crucial factor — and you recognize it. You tried suicide and that failed, so instead you withdrew psychologically into this fantasy world.”

“If Carol told the Terran authorities she wouldn’t now be free to—”

“That’s right. Your wife is in prison. That’s where you visited her,
at our prison in New Detroit-G, here on Ganymede. Frankly, I don’t know what the effect of my telling you this will have on your fantasy world. It may cause it to further disintegrate, in fact it may even restore you to a clear perception of the terribly difficult situation which we Ganys face vis-a-vis the Terran military establishment. I’ve envied you, Cupertino, during these last three years. You haven’t had to face the harsh realities we’ve had to. Now—”
He shrugged. “We’ll see.”
After a pause Cupertino said, “Thanks for telling me.”
“Don’t thank me; I did it to keep you from becoming agitated to the point of violence. You’re my patient and I have to think of your welfare. No punishment for you is now or ever was intended. The extent of your mental illness, your retreat from reality, fully demonstrated your remorse at the results of your stupidity.” Hagopian looked haggard and gray. “In any case leave Carol alone! It’s not your job to exact vengeance. Look it up in the Bible if you don’t believe me. She’s being punished, and will continue to be as long as she’s physically in our hands.”
Cupertino broke the circuit.
Do I believe him? he asked himself.
He was not certain. Carol, he thought. So you doomed our cause, out of petty, domestic spite. Out of mere female bitterness, because you were angry at your husband, you doomed an entire moon to three years of losing, hateful war.

Going to the dresser in his bedroom he got out his laser beam. It had remained hidden there in a Kleenex box, the entire three years since he had left Ganymede and come to — Terra? He dismissed that question.

Now, he said to himself, it’s time to use this.

Going to the phone he dialed for a cab; this time he would travel to Los Angeles by public rocket express, rather than by his own wheel.

He wanted to reach Carol as soon as humanly possible.

You got away from me once, he said as he walked rapidly to the door of his conapt. But not this time. Not twice.

V

Before John Cupertino lay the Los Angeles Times. Once more he leafed through it, puzzled, still unable to find the article.

Why wasn’t it here? he asked himself. A murder committed, an attractive, sexy woman shot to death! He had walked into Carol’s place of work, found her at her desk, killed her in front of her fellow employees, then turned and, unhindered, walked back out. Everyone had been too frozen with fear and surprise to interfere with him.

And yet it was not in the homeopape!

“You’re looking in vain,” Dr. Hagopian said, from behind his desk. “It has to be here,” Cupertino said doggedly. “A capital crime like that — what’s the matter?” He pushed the homeopape aside, bewildered. It made no sense. It defied obvious logic.
“First,” Dr. Hagopian said wearily, “the laser beam did not exist; that was a delusion. Second, we did not permit you to visit your wife again because we knew you planned violence—you had made that perfectly clear. You never saw her, never killed her, and the homeopape before you is not the Los Angeles Times. It’s the New Detroit Star . . . which is limited to four pages because of the pulp-paper shortage here on Ganymede.”

Cupertino stared at him.

“That’s right,” Dr. Hagopian said, nodding. “It’s happened again, John. You have a delusional memory of killing her twice now. And each event is as unreal as the other. You poor creature! You’re evidently doomed to try again and again, and each time failing. As much as our leaders hate Carol Holt Cupertino and deplore and regret what she did to us—we have to protect her. It’s only just. Her sentence is being carried out; she’ll be imprisoned for twenty-two more years, or until Terra manages to defeat us and release her. No doubt if they get hold of her they’ll make her into a heroine. She’ll be in every Terran-controlled homeopape in the Sol System.”

“You’d let them get her alive?” Cupertino said presently.

“Do you think we should kill her before they take her?” Dr. Hagopian scowled at him. “We’re not barbarians, John! We don’t commit crimes of vengeance. She’s suffered three years of imprisonment already. She’s being punished sufficiently.” He added, “And so are you. I wonder which of you suffers more.”

“I know I killed her,” Cupertino persisted. “I took a cab to her place of employment, Falling Star Associates, which controls Six-Planet Educational Enterprises, in San Fernando. Her office was on the sixth floor.” He remembered the trip up in the elevator, even the hat which the other passenger, a middle-aged woman, had worn. He remembered the slender, red-haired receptionist who had contacted Carol by means of her desk intercom. He remembered passing through the busy inner offices, suddenly finding himself face to face with Carol. She had risen, stood behind her desk, seeing the laser beam which he had brought out. Understanding had flashed across her features and she had tried to run, to get away . . .

But he had killed her anyhow, as she reached the far door, her hand clutching for the knob.

“I assure you,” Dr. Hagopian said. “Carol is very much alive.” He turned to the phone on his desk, dialed. “Here, I’ll call her, get her on the line; you can talk to her.”

Numbly, Cupertino waited until at last the image on the vidscreen formed. It was Carol.

“Hi,” she said, recognizing him. Haltingly he said, “Hi.”

“How are you feeling?”

“Okay.” Awkwardly he said, “And you?”

“I’m fine,” Carol said. “Just a little sleepy because of being woken up so early this morning. By you.”

He rang off. “All right,” he said to Dr. Hagopian. “I’m convinced.”
It was obviously so. His wife was alive and untouched; in fact she evidently had no knowledge even of an attempt by him on her life this time. He had not even come to her place of business.

Hagopian was telling the truth.
Place of business? Her prison cell, rather—if he was to believe Hagopian. And evidently he had to.

Rising, Cupertino said, "Am I free to go? I'd like to get back to my conapt. I'm tired, too. I'd like to get some sleep tonight."

Hagopian said, "It's amazing you're able to function at all, after having had no sleep for almost fifty hours. By all means go home and go to bed. We'll talk later." He smiled encouragingly.

Hunched with fatigue, John Cupertino left Dr. Hagopian's office. He stood outside on the sidewalk, hands in his pockets, shivering in the night cold, and then he got unsteadily into his parked wheel.

"Home," he instructed it.
The wheel turned smoothly away from the curb to join traffic.

I could try once more, Cupertino realized suddenly. Why not? And this time I might be successful. Just because I've failed twice—that doesn't mean I'm doomed always to fail.

To the wheel he said, "Head toward Los Angeles."
The autonomic circuit of the wheel clicked as it contacted the main route to Los Angeles, U.S. Highway 99.

She'll be asleep when I get there, Cupertino realized. Probably because of that she'll be confused enough to let me in. And then—
Perhaps now the revolt will succeed!

There seemed to him to be a weak point in his logic. But he could not quite put his finger on it. He was too tired.

Leaning back he tried to make himself comfortable against the seat of the wheel. He let the autonomic circuit drive and shut his eyes in an attempt to catch some much-needed sleep.

In a few hours he would be in South Pasadena, at Carol's one-unit dwelling. Perhaps after he killed her he could sleep. He would deserve it, then.

By tomorrow morning, he thought, if all goes well she'll be dead. And then he thought once more about the homeopape, and wondered why there had been no mention of the crime in its columns. Strange, he thought. I wonder why not.

The wheel, at one hundred and sixty miles an hour—after all he had removed the speed governor—hurtled toward what John Cupertino believed to be Los Angeles and his sleeping wife.

END
THE PANI PLANET

by R. A. LAFFERTY

Illustrated by NODEL

Too bad about the Pani!
They didn’t understand
Earthmen – or need to!

I

"Is it broke?" asked Leska the Pani story-teller too eagerly.
"Is what broke?" Colonel Zornig turned angrily. "How did you get in here? We can’t allow you here at such a time. Our guards are posted."
"Is fun of ours to evade your guards," said Leska. "Is a hobble of ours. The man mechanism, is it broke?"

"Our companion and commander is dead," said Colonel Zornig. "Do you understand the word?"
"Sure. It is broke like I said. Haven’t you parts to fix it?"
"There are no parts that would avail. One dies completely."
"Bad design. Give it to me. Maybe I can fix it."
"No. Your presence here at this time becomes grotesque, Leska. I’ve even ordered the other men away."

95
I wish to be alone with my friend encased there. I ask you once more to leave, or I'll have you put out in a pretty rough manner."

"What you do with it now if you don't try to fit it?"

"We will bury our commander General Raddle with simple rites and a great sense of loss."

"Bust the verb, Buster! What is bury?"

"Must I explain to a bug? We have placed our dead companion in this rough box, and will set it in the ground. And we will cover him up with the plain dirt of this planet and so leave him forever."

"And will that fix it? How?"

"Of course it will not fix it—him—General Raddle. He is dead. Clear out now, Ieska. I'm feeling pretty pent up, what with the death of my commander. I've a mean streak in me, and it's due to come out."

"Give the thing to me if you're just going to hole it in the ground. If I can't fix it maybe I can use some of the parts for something else. I always did want to see how one of you things was put together."

"I'll try once more to explain it to you, Ieska. This is our companion who has died. We cannot give him to you. We must bury him in the ground, and we feel great sorrow at his death. Do you understand sorrow?"

"I understand selfish, man Colonel. You are like the dog in the mangle in your own proverb. The thing is broke and you cannot fix it. You will hole it in the ground to no purpose, but you will not give it to me. I could have fun fooling around with one of your broke things. I think I know something I could make out of it. We will see what your selfish does for you!"

And Ieska the Pani story-teller and interpreter left in a mood that was perhaps anger.

There were very contradictory accounts of the Pani people and of Pani planet. The place would seem an unusual find, but it had been visited before by both humans and others, and had not been permanently claimed. The promise of it had never been fulfilled.

And whatever explanation you might make of the Pani people might not be valid in the next moment. They were like quicksilver, the way they were stupid, and then they were astute. They had done nothing with their world. They were the most primitive people imaginable.

Were the Pani really intelligent creatures? It was still debated, but opinion had about decided that they were. After all, there was Ieska. In his own way he was surely intelligent, and he owned himself the most stupid of the Pani. Doctor Mobley had once asked how he happened to become the Pani story-teller and interpreter.

"Was nothing else for me to be," said Ieska. "I am too pot-bellied to be a tree-climber, too short-winded to be a hunter, to weak to be a porter, too untalented to be a mime, too stupid to be a farmer. What other trades are there? Believe me, men things, I feel the shame of my low position. But what can I do?"
“Did you not find our language difficult?” Doctor Mobley had asked him. “We find yours impossible.”

“No. Yours is little child-people talk. Nothing but sounds to it. Anybody can make sounds. You should know the way some things talk: odor talk, skin temperature code talk, magnetic fluctuation talk, light bear stuff talk, mental image stuff talk. Yours is easiest of all. Nothing but noise. Anybody can make noise.”

Yes, Ieska was intelligent in his way, and he was a Pani. But the Pani had not progressed beyond the stone age—or the volcanic glass age—in their artifacts. Damn the Pani creatures. A good man was dead, and who thinks about bugs or beasts at such a time? General Raddle was dead, and no expedition had ever had a finer leader.

He had been, for one thing, a master strategist. The test of a great strategist is that his last move shall be the correct one. Sometimes it seemed that every move that General Raddle made was the wrong one. But his last move in a campaign was always the right one, and it made all the previous moves not only right but inevitable. He had a devious mind that went directly to the point—but a point never understood till later. How he had pulled them out, time and again, when everything seemed lost!

Who would lead them now? Colonel Zornig would try. The colonel was a good man but now he had a sinking feeling that, in dealing with the baffling Pani people, every move he made might be the right one until he came to that final move. But what if that last move were wrong and made every previous move wrong? His doubts fed his fury when Ieska broke in on his brooding again—for the guards could never keep that creature out.

“What if we steal it out of the hole in the ground, man Colonel?” Ieska asked suddenly. “What if we are able to fix it after all? I know it can be done, for your own man mechanisms have done it. You have the legend of Zombies who were broke and fixed again. Where is smoke is fires. Your say-word, not mine.”

“Zombies, dammit! Zombies are only a superstition, Ieska,” said Colonel Zornig with more patience than he felt. “Intelligent people do not believe in such. Do you understand superstition, Ieska?”

“More than that, I understand superstition about superstitions. The one who says he is not superstitions, Colonel, he is your patsy. Wait and be educated, man Colonel.”

They buried General Raddle. They gathered around the new grave, Colonel Zornig, Major-Doctor Mobley, Majors Wister, Mountain, Crowell, Crocker, Dutton: all the good friends. They spoke good words about the dead general, and they meant them. They laid him there in his grave, and they put an all-hours guard around it.

Colonel Zornig was in command, and he handled things rapidly and well.

This was not a routine assignment, whatever it seemed. The men of the previous expedition had all died.
There were traces of other expeditions by other species. But there had been no permanent settlement and no maintained claim. Something had the habit of happening to visitors to Pani planet.

Colonel Zornig coddled the Pani less than General Raddle had done. He brought them quickly to heel. Pani was a rich planet. The men could not allow their exploration to be hampered by the resentful people-animals. The Pani were treacherous, they were schemers. They had no weapons but glass knives, but these were scalpel sharp. They could kill a man with them if they got close enough, and they had the habit of drifting through the guards as though they were fog and coming uncomfortably close.

The military problem was simple: to set up a pale and maintain it; to infiltrate and not be infiltrated; to prevent trouble at its beginning.

But the Pani seemed not to understand. For that reason it was suspected that they understood too well. They were into everything. And so simple minded and pathetic did they seem when they were reprimanded.

Colonel Zornig instituted flogging to show the Pani that he was serious about them keeping their places. He didn’t know if it did any good. The Pani grinned when they were whipped, and they grinned about it.

“Have you people no sense of pain?” he questioned.

“Man colonel, we sure don’t like the stuff,” Ieska said.

“But you grin when you’re whipped.”

“The happy grin is a convention of your own sort, I believe. With us the grin doesn’t mean the same thing.”

“What does it mean then?” Zornig demanded.

“It mean, ‘there will come a day, men things, there will come a day.’”

So the colonel knew he could still expect trouble from the Pani.

He didn’t wait. He went to meet the trouble. He found out the Pani secret societies and broke them up. He seized the leaders. He transported two hundred of them to an island that they had never inhabited. They hadn’t the technique to cross back from it. He seized the knives of all but certain farmers who must have them to cut their cane. He marked these with numbers; they must be turned in every evening or the registered owner’s life was forfeit; and it was death for any Pani to have an unmarked knife. He drew a circuit of three hundred yards around the garrison, and it was death for any Pani to be found within that circuit without being sent for and accompanied by a guard. He leveled one hut of every four of the Pani’s and destroyed one quarter of their gathered food.

“It is not for punishment for what you have done,” he told them through Ieska. “It is for punishment for what you had better not do. At your first false move we will destroy one quarter of you creatures as we have destroyed one quarter of your dwellings and food. At the second false move we will destroy all of you.”

The Pani lived very quietly then,
but they seemed to smolder. They were funny folks. You only thought you knew them.

“What are these pictures of?” Zornig asked the expedition photographer one day.

“Oh—they are pictures of the Pani,” the man said.

“But they don’t look like that,” he retorted.

“No, they don’t really. But what do they look like, Colonel? They looked like that at the moment this picture was taken.”

What did they really look like? What were they really like?

“I believe my every move has been correct so far,” Zornig told Doctor Mobley. “Do I not have them cold?” he asked.

“They won’t accept it,” Doctor Mobley said. “I believe they will now make a move so curious that you will hardly be able to pin it on them or be sure they have done it when it is done.”

“We’re surely a match for a bunch of stone-age bugs,” said Zornig. “What can they do?”

They made a move so curious that Colonel Zornig could not pin it on them and was not sure that they had done it when it was done.

They stole the body of General Raddle.

Or perhaps they didn’t. The grave was guarded all the time and no Pani approached it. But the grave seemed disturbed and Colonel Zornig had a moment of unaccountable panic. He ordered it opened. The box was there in the loosened dirt. But the General’s body was not in the box.

II

One of the sergeants came to Colonel Zornig several days later. This man had learned a little Pani and was often sent to bring one or another of them in. He understood them best of all the men. The man told Colonel Zornig of the rumor that the Pani did have the body of General Raddle, and that they were trying to fix it, to bring it back to live. “Say nothing about this,” Zornig told the man.

“I play a waiting game now,” Zornig told himself. “It may keep them occupied. General Raddle had a sly humor, and I doubt if he’ll really mind the desecration of himself. While they try to animate the body they’ll have no time for conspiracies. Meanwhile I’ll devise a suitable punishment. The little beasts will play into my hand on this one.”

And again several days later, the man who had learned a little Pani reported that he had heard that the Pani had had some success at the reanimation—that the body could now sit up and talk a little and would soon be able to take nourishment. Zornig chortled.

“The bugs are having you, son,” he chuckled. “What sort of superstitious lout are you to be gulled by bugs?”

“No. I believe there is something to it,” insisted the soldier.

And after another couple of days the man reported that Pani friends had told him that the body of General Raddle could now walk and was eating well, and would soon be fixed completely.
So the man was clapped into the guardhouse for being made a fool of by things that were less than human.

One morning Major Crocker came to Colonel Zornig. The man was death-white and his jaws worked soundlessly. It came to Zornig that the man was like one in a nightmare who tries to cry out and cannot.

Doctor Mobley staggered in. He was out of his wits. He never gained them completely. He was badly frightened.

Major Wister and Crowell stumbled up in a like condition of terror, and Colonel Zornig could get nothing out of the fellows at all.

“I got to find what ails the fools,” Zornig growled. “Terror is catching. I can’t have my command spooked by some nonsense.”

Terror is catching. Colonel Zornig caught it. What he saw now froze his scalp and he felt all the blood drain out of him. He worked his jaws soundlessly. He himself was the man in the nightmare who tries to cry out and can make no sound. He was unable to break out of the nightmare.

What he saw was General Raddle. General Raddle did not look well. He had never looked well; but he looked himself.

“Colonel Zornig,” growled General Raddle dryly, “I would like to see my own death certificate. I believe that it is in error.”

“Colonel Zornig,” said General Raddle after he was seated in his office and after he had examined his own death certificate for a long minute, “arrest Doctor Mobley.”

“Arrest Doctor Mobley? Why?”

“I am not in the habit of explaining to subordinates,” said Raddle. Then he smiled sourly. “But this time I will. Doctor Mobley knew that I was subject to cataleptic trances. None of the rest of you knew it; I would not have been given my command if it were known. I am not in good health, but I do not suffer from the failing that is here given as the cause of my death. Doctor Mobley knew that I was not dead. He ordered me buried alive.”

“But, General, you could not have lived through it.”

“I am here, am I not?”

“But you were in the grave for ten equivalent days. No catalepsy could survive that.”

“I was not in the grave at all. I was not in the coffin when you buried it. The Pani are sly, but not that sly. They couldn’t have had me from a guarded grave. There was a settling of the ground at the grave; and there were the rumors: so you opened the grave and found me not in the box.

“But the Pani made the switch earlier—after you had closed the box and sent the others away. Ieska distracted you. They stole me from behind your back and put in an equivalent weight of dirt, and closed it again. They move as noiselessly as smoke.”

“Good God! Were you conscious?”

“I was comatose. I could hear fit-
fully and I could feel movement. The Pani understood death. They sensed that I was not dead, that I was only sick—broke. They could not understand your not trying to cure—fix—me. They wished to try to fix me, and they believed that they could do it. They have elements of genuine medicine mixed with their hoodoo. And they did fix me—aided by time and my own constitution."

"Are—are you sure?"
"I am sure that I am here, Colonel Zornig. Stop gaping like a fish!"

In short hours, General Raddle reversed most of the policies of Colonel Zornig. In particular he gave orders that Ieska was not to be molested. He held Doctor Mobley under close confinement under the charge of attempted murder.

"The Pani are a gentle people," the general told Colonel Zornig, "and they have saved my life. I was too harsh with them before, and you have been a dozen times too harsh. We will make it up to them. Colonel, disband the regular guard entirely."

"That is against the standing orders for the Expedition."
"No. There will be a special guard. There is provision for that."
"Who shall I put on the special guard, General, and how will it differ from the regular guard?"
"You will put no one on it. I will attend to it completely. Certain of the men will be put on guard by myself. Who they are will be known to no one but me. They will not seem to be on guard, but they will be alert. I am playing a hunch and I've had good luck with my hunches."

"Your hunch may get us all killed, General. Remember that we found all the members of the previous Expedition dead."
"Yes. Of an unfortunate epidemic."

"Doctor Mobley says that it was a subtle poison."
"So subtle that he could find no trace of it? Doctor Mobley has a pathological hatred of the Pani. It was because I was too easy on them that he tried to kill me. These people will be completely friendly if we treat them right. There's no guile in them at all."

"General," said Colonel Zornig futilely, "there's one opinion—and I lean to it—that the Pani are the most tricky, devious, triple-dealing, intransigent, ambushing, merciless creatures that have ever been encountered. There is the story that they murdered not only the members of our previous Expedition but those sent out by half a dozen different sorts of other civilizations also. They are sworn to kill every visitor to their world. Why else has so promising a planet not been developed?"

"I believe that no other party—if there were any besides the previous human one—realized the promise of the place."

"The exploratory parties always realize the promises of a place. We're not exceptional. The Pani have killed by trickery everyone who has come here!"

"Colonel Zornig, who was it who gave you the idea that the Pani are the most tricky, devious, merciless
creatures ever encountered?” asked General Raddle.

“Ah—well, I suppose it was Doctor Mobley.”

“The demented doctor again! Let us consider the subject closed.”

III

General Raddle had always been right, and very often he had seemed to be wrong till his final move.

A man must trust the ability of someone. Colonel Zornig had to trust the judgment of the general, since he could no longer trust his own. The whole thing bothered him, but he had to go along with it.

And he had to like Ieska who now had the run of the place more than ever before. One had to like all the Pani. They had apparently forgotten all previous harsh treatment and were now most cooperative.

General Raddle had seemingly been right about Doctor Mobley. That man, brooding in his detention, soon became little more than a vegetable. He said that he was dying by the subtle poison of the Pani! He pointed to rocks and bushes in the area and said that they were Pani ready to spring. He insisted that the Pani people who were able to raise the dead might be capable of anything. And Doctor Mobley did not accept the account of General Raddle.

“Of course he was dead,” the doctor whined. “I certified him dead, didn’t I? I wish he had stayed dead. Did I kill him, you ask me, Zornig? Did I bury him alive? Well, maybe

I did. One forgets things ... I’d like to do it again.”

And the planet showed itself more promising every day, and the Pani became still more cooperative.

Sometimes it seemed that a bell was booming a thousand leagues away, yet Colonel Zornig knew that it was inside his own head. It would not be silenced.

The man who had learned Pani talk best came to Colonel Zornig and told him that the Pani secret societies had been revived.

“I know it,” said the colonel, “and General Raddle knows it. He says that they are harmless. I respect his judgment.”

“And I respect yours, Colonel,” said the man, “if you will ever make one. It had better be pretty soon.”

“The general has always been right before.”

“I know it. But now I believe that there is something wrong about the general.”

This soldier was named Fraker. He seemed a simple-minded fellow, but he had a way of understanding aliens.

The Pani people behaved perfectly, but the same could not be said about the humans. The men had all become very jumpy. They had the new habit of always looking over their shoulder as though they were being followed. Zornig found himself doing it. He became irritable and suffered headaches. It was that bedamned bell bonging in his head — the warning bell.

The thing that bothered him most was that he didn’t know who was the guard. It seemed that nobody
was on guard. "They will not seem to be on guard, but they will be alert," General Raddle had said. But dammit, Zornig should be able to tell when a man was on guard — even on a special guard! He knew these men.

But he trusted the general.

Colonel Zornig was accustomed to doing little military position problems in his head. Such a thing must not be permitted to occur at the same time as another thing, for instance. One or another thing might be neglected, but there were collusions of things that must not be all neglected at once. There was now arriving a coincidence of events and dispositions that could be disastrous, like an old astrological coincidence of planets in a certain sign boding evil. And the Pani were astrologers — in their own way.

Zornig noted certain movements and activities of the Pani, certain negligences of the men, certain orders of General Raddle. They dovetailed too perfectly to be accidental. There would come an hour — very soon — when the men might be completely in the hands of the Pani, if the Pani realized it.

Was it all coincidence? Was it a clever plan of General Raddle, who had never been wrong in these things? Was the general giving the Pani a chance to hang themselves on their own liana? Were the special guards really alert, though not seeming to guard, as General Raddle had said? Was there somehow to be the final and correct play by the general?

Or would it be something else?

Zornig went once more to the prisoner, Doctor Mobley.

"Are you in your wits, Mobley?"

he asked softly.

"I am not, and I have not been since the general returned. I decided that there was only one sane explanation of the event: that I was crazy."

"Tell me one thing only. Was General Raddle dead?"

"Colonel, he was dead. I was not yet crazy when I signed his death certificate."

"Could a simple people like the Pani somehow have the knowledge to bring a dead man back to life?"

"That is what I lost my mind over. But even as a crazy man let me correct you in one error. Primitive peoples are never simple. They are frighteningly complex. It is we who are simple, because civilization is nothing but a simplification."

"Doctor Mobley, it is easier for me to believe that you were mistaken than to believe that the general was raised from the dead."

"Maybe I wished the general dead," said the doctor.

As Zornig walked out with uncertain mind the man Fraker came to him.

"Colonel," said Fraker, "I have to tell you that I know that something is very wrong, and that I have nothing to go on. But, whatever is going on, it will crest in a very short while. The Pani are about to make their push, and I know the Pani."

"I know you do. And I know that they will make their move in a
certain hour very soon. I am sure that the general knows it also. It may be quite a coup, and I hate to be left out of it. I trust the judgment of the general on tactical movements, and I trust your premonitions on aliens.”

“Then trust my premonition on the general. There is something wrong about him.”

“I have nobody on whom I can depend absolutely—unless it is yourself, Fraker. Have you four or five men you can depend on?”

“Three.”

“Get them! And get Ieska.”

“Ieska is under the special protection of the general. No one is allowed to touch him.”

“We break rules now! Get your men, and get Ieska! Bring him to the old guardhouse, and do it quickly. We haven’t too much time before the coincidence of events.”

They had Ieska the Pani Story-Teller. They stretched him flat on his back, or as flat as his peculiar body would permit, and they did it to the sound of rending bones and tearing cartilage.

“I believe it is time that you tell us a little story, Ieska,” said Colonel Zornig. “Tell us the true story of what has happened to General Raddle and what is intended to happen to us.”

“Is reason why that story cannot be told, man Colonel,” said Ieska in pain.

“What reason?” asked Zornig, and he shoved a pike an inch into Ieska’s belly.

“The story involve bamboozle. Stories of bamboozle may only be told when warm summer sun is shining. The story involves protection of Fatherland, and such story can only be told when winter night grips world. The story involve stranger people, you, and story of stranger people may only be told when South wind is blowing. The story involve real slick tactic, and real slick tactic is the son of the West Wind. And also the story involve trap inside a trap inside a trap, and three-trap story may only be told on windless day at high noon. Our stories are ritual and can only be told at set times. As you understand, this tale could only be told on cold winter night with hot summer sun shining, and winds blowing every direction and not at all. Therefore the story may not be told. Circumstances will not permit it.”

Colonel Zornig shoved the steel pike two inches more into the belly of Ieska. “I set up a special set of circumstances, Ieska,” he said. “Consider again whether the story may not be told after all.”

“Who would have believed it?” asked Ieska. “It is a cold day in hell for me—your proverb, not mine. The high sun is shining on a cold winter night, and the South wind blows windlessly out of the West. Were I the hero type it would be different, but I am only Ieska . . . Surely you have guessed the story or you would not have me stretched out here.”

“Almost guessed it, Ieska. Did you in some manner tamper with General Raddle’s mind and make him your partisan?”
“Maybe is not all lost if you are so dumb. What we know about minds and to tamper with them?”

“Perhaps very much. How did you manage to bring him to life again anyhow?”

“Man Colonel, ease off the point stick stuff a little. It only hurts me when I laugh — your folk joke, not mine. Is cruel not to permit me high hilarity over this. How will anyone bring him back to life? And you have said you were not superstitious.”

“Then you have somehow duplicated him?”

“Kill me! Run it clear through me! I have to laugh for this even if it kills me.”

“I’ll kill you damned soon if I have no answer. What did you do to General Raddle?”

“Kill me then, but this is truth: we didn’t do anything to him. What could we do? We couldn’t any more fix him than anything. After a while he got pretty what you call foul smell and we got rid of him.”

“Then who has been commanding us?”

“Like in one of your joke books, man Colonel — Who, me driving? I thought you were driving!” Nobody has been commanding you, man Colonel. We like it that way.”

“Hold the pike on the little bug,” the colonel told one of the men. “The rest of you come with me, and hurry it along. There’s a coup to be pulled, and I sure won’t be left out of it. I’ve turned this in my mind so much that I know just where to pull the string.” He left the room.

IV

It was sudden, and it was sure. The trap inside the trap inside the trap can go either way. The Pani had been given enough slack, and they hanged themselves on their own rope.

Their plan was set. Nobody could have changed it except Ieska, and Ieska was pinned down in the old guardhouse. It was planned so neatly that the counter moves to it were automatic in the mind of Colonel Zornig. He had seen the threat clearly. He had constructed in his mind just how General Raddle would have to have trapped the trappers in the grand coup — if there had any longer been a General Raddle, if there had been a coup designed in any mind other than that of Colonel Zornig.

A dozen pockets of Pani infiltrators were taken almost simultaneously. They would have had the humans dead and dispatched. The shambling little shadows had come very close to pulling it off.

And then there was nothing to it. They were caught flat. They saw their grand plan collapse, and they became once more nothing but surrounded bunches of snuffling bugs — no more a threat, no more anything. But now always to be watched, and their watching to be delegated to experts.

Colonel Zornig had the putative General Raddle stretched flat on his back beside his fellow conspirator Ieska. He didn’t look so much like General Raddle when he
was stripped. The Pani mimicry only go so far.

"Where have I slipped up?" asked Ieska. "I thought I could riddle talk you till the time had go by and we have you. How smart alec Colonel know how to dash out and do it while was still time? How you know he is not General Raddle when I double talk you along?"

"Skuuortflochnung," said the Pani who was no longer General Raddle.

"What does your friend say, Ieska?" asked Zornig.

"He says I have the mouth disease. It means I have talked too much somewhere along the line. How is that possible with a genius like me? Where did I slip, man Colonel?"

"Very early, Ieska. It was once when you were talking to Doctor Mobley and several of us. You said that you were too pot-bellied to be a tree-climber, too short-winded to be a hunter, too weak to be a porter —"

"I kidded you, man Colonel. I dissembled so you would not know how capable I am and would not be so suspicious of me. At all these things I exceed."

"— too stupid to be a farmer —"

"And myself the most intellectual of the Pani! Was not that rare jokes I made?"

"— and too untalented to be a mime."

"Ah, there I have dropped the molasses jug, there I have cracked the cooky jar, there was where the excretion hit the air-vanes — your say words all. That we are mimes who can mimic anything — I let that cat out of the carpet bag. In this I was near as stupid as yourself."

"We all slip, Ieska. And now what do you suppose will happen to you?"

"One: You will kill me. Two: You will ship me back to be exhibited as a sort of freak in a zoo."

"Which do you prefer?"

"That you kill me. I have my pride."

"And your tongue. You still lie with it. I know which you really prefer, and you win in this. I'd kill you with perfect delight, but we have our instructions as to the handling of interesting specimens. You will be on exhibition. You always have been."

"I must find about bookings. Where is multi-list planetary edition of Billboard man soldier have lying around?"

END

IF YOU'VE MOVED

. . . please let us know, will you? Send both addresses, the old and the new, to:

Subscription Dept., Galaxy Publishing Corp.,
421 Hudson Street, New York, N.Y. 10014
Stella and the Moons of Mars

by ROBERT S. RICHARDSON

Remember Lyle Boyd’s The Provenance of Swift? Here’s an astronomer’s eye view of the same curious facts!

According to the dictionary a mystery is something that has not, or cannot, be explained. There are several things about the moons of Mars that have not as yet been explained to everyone’s satisfaction. Whether they cannot be explained is another question.

The discovery of the two tiny satellites of Mars at the close opposition of 1877 was almost as big a surprise as the discovery of the canals in the same year. But it was a surprise of a different kind. After nearly a century astronomers are still divided over the reality of the canals. This controversy has now reached such an impasse that they don’t even talk about it anymore. There was never more than a fleeting doubt as to the reality of the satellites. Rather it was their behavior that proved so astonishing. Who could have believed that Mars was attended by two such remarkable companions? Well, a century
and a half earlier there was at least one person who did. But that was for children...

The story of the discovery of the satellites of Mars is a familiar one to most astronomers, amateurs and professionals alike. Our only excuse for presenting it here is that a good understanding of the nature of these bodies is necessary for a critical appraisal of the material we wish to present later. We would appreciate the reader’s opinion on this material. It is material over which it is possible to hold quite different opinions as I have already discovered by discussing it with my associates. My own mind is made up on it but doubtless there will be many that disagree. For these reasons perhaps a few refresher remarks on the satellites will not be out of place.

Asaph Hall, their discoverer, said later that he undertook the search for a satellite of Mars because he had gotten tired of reading in the textbooks that “Mars has no moons”. I would question whether this had much to do with it. Apparently Hall had long been interested in Mars, as evidenced by several papers he published showing his drawings of the planet.

Hall was on the staff of the U.S. Naval Observatory, Washington, D. C., which had an excellent 26-inch refracting telescope made by Alvin Clark & Sons, the firm that had turned out so many fine lenses. Such an instrument would seem to be ideal for ferreting out faint objects. Hall was well aware, of course, that Professor d’Arrest of the Copenhagen Observatory had conducted a search for a satellite of Mars at the previous close opposition of 1862 without success. But with the Clark refractor at his command he felt it was well worth another try. One thing was sure: it was unlikely that he would discover a satellite of Mars by NOT looking for it.

Those whose experience with satellites is confined to observations of Io, Europa, Ganymede, and Callisto of Jupiter, and Titan of Saturn, through a 3-inch 'scope in their backyard, can have little conception of the difficulties involved in trying to pick up a satellite that is just on the limit of visibility. Any faint star within a few diameters of the planet would be immediately suspect. Hall knew it must be very faint or otherwise it could not have escaped detection so long.

You might suppose that a powerful telescope would reveal so many faint stars that he would have been overwhelmed with potential satellites. This is because people do not realize how small a portion of the sky is visible through a telescope. Picture in your mind the apparent area in the sky occupied by the full moon. Seen under low magnification the disk of the full moon will usually just about fill the field of view. Now a large telescope does not show you a larger section of the sky; it shows you a smaller section. Under high magnification a large telescope may show you the region around only a single lunar crater such as Plato or Tycho or Copernicus. It is not surprising, therefore, that only a few stars are
ordinarily visible around a planet unless you happen to be in the Milky Way.

Suppose some night there is a suspicious looking object near Mars. (Astronomers call a newly discovered body an “object” until its nature has been established.) How would you know whether it was a satellite or a star or what? For several nights you couldn’t be sure of its nature. Eventually it would reveal itself through its motion. The stars are fixed in the sky relative to one another, except for very slow motions which need not concern us here. Since the stars are at immense distances compared with the members of the solar system, a planet revolving around the sun will appear to be moving against the background formed by the much more distant stars. If an object seen near Mars tonight is a star it will not be near Mars tomorrow night, since the planet will have moved away from it. But if the object is a satellite it will still be in the vicinity of the planet on the following night, since the satellite shares the motion of its primary around the sun. Of course the satellite has a motion of its own, but this is small compared with the orbital motion of the planet and satellite together around the sun. If there happen to be several faint stars in the field of view a suspicious object could be identified in a few hours by checking against them.

But you can still get into trouble on occasions. About a month before the faster moving Earth catches up and passes Mars at opposition, the planet apparently stops its eastward motion among the stars, as it comes to its first “stationary” point. Due to the combined motion of the Earth and Mars the planet seems practically fixed among the stars for about 10 days. Then Mars begins moving westward or “retrogressing” among the stars. This may continue for a month after opposition when Mars stops again at its second stationary point. After about another couple of weeks it begins moving forward or eastward again. Thus, if an astronomer picked up a distant slow-moving satellite when the planet happened to be at one of its stationary points he might be uncertain of its nature for a considerable time.

I once asked the late Dr. Seth B. Nicholson, discoverer of four of the satellites of Jupiter, if he didn’t quite get a thrill out of his first discovery, that of J IX (Jix). He said, no, because it took so long before he could be certain he had discovered a satellite or not. By the time he was sure about it all the kick had gone out of it.

The most trouble by far that an astronomer has in this kind of work, however, is with asteroids that happen to be in the vicinity. Suppose an asteroid is in the same field of view a few million miles beyond Mars. It will not only be indistinguishable in appearance from a satellite, but will also have nearly the same motion as Mars. This means that for a week or more an astronomer will not know whether he has a satellite or merely another miserable asteroid.
While searching for satellites of Jupiter in 1938 with the 100-inch reflector on Mount Wilson, Nicholson picked up 32 asteroids on his photographs which had to be eliminated as possible Jovian moons, before he found J X and J XI. When Nicholson died in 1963 he and Galileo were tied with four moons apiece.

Hall’s greatest trouble was with the planet Mars itself. Objects in its proximity were dimmed by the glare from the disk, in somewhat the same way that the stars are dimmed and extinguished at dawn by the sun. By keeping Mars just outside the field of view he was able to reduce the diffuse illumination from the bright disk. And as usual, the astronomer’s old enemy, Bad Seeing, was there to plague him too. Seeing conditions became so bad on the night of August 10, in fact, that he closed the dome and went on home, feeling that further work was useless. It is hard to understand an astronomer’s frame of mind on such an occasion unless you have experienced it yourself. There is a feeling of deep depression and frustration, mingled with a sense of guilt at quitting work when the stars are shining. There is a story which I have never been able to confirm, that Hall was so discouraged he was ready to give up the project altogether, had not his wife urged him to return to the observatory for one more look. Hall did so, and this time spotted a star-like object near Mars that looked more hopeful than anything he had seen so far. He barely had time to measure its position before a fog came in from the Potomac River and stopped work that night for good.

The clouds did not clear away until August 15, and when they did the seeing was so bad he was unable to do anything with Mars. On the following night the object was sighted again, and found to be moving with the planet. On August 17, while watching the new object, he found another one, revolving closer to the planet. For several nights the motion of this inner moon was a puzzle, as it would appear on opposite sides of the planet during the same evening, so that at first Hall thought there were two or three inner moons. It seemed incredible to him that a satellite should revolve around its primary in less time than its primary rotates.

To settle the matter he kept watch throughout the nights of August 20 and 21, finally convincing himself that there was only one inner moon, which revolved around its primary in less than one-third of the period of its primary’s rotation. No case of this kind was known in the solar system at that time, nor is any known today. As the discoverer of these new members of the solar system, Hall had the privilege of deciding on their names. Out of several that were suggested, he chose Phobos (Fear) for the inner satellite, and Deimos (Panic) for the outer one, the names of the two companions of the war god.

Hall was so exhausted from the
strain of tracking his satellites night after night without a break, that he was unable to undertake the task of computing their orbits, which is understandable enough. Also, after a long stretch of observing at the telescope you often have an unaccountable feeling of aversion to desk work. While Hall was taking what is known as a well-earned rest, this part of the job was turned over to Simon Newcomb, who later became one of the world's foremost authorities on dynamical astronomy. Newcomb relates that Hall told him of his first observations of Deimos in such a casual sort of way, he feared he might not bother to follow up and confirm his discovery. It is quite evident from what followed that Newcomb misread Hall completely.

Incidentally, it is worth noting that Hall almost didn't get his appointment to the staff of the Naval Observatory. This was not due to any lack of proficiency but rather to the fact that he had a considerable and growing family! The previous Chief of Staff was of the firm opinion that the astronomer who filled this position should live in the style that beffited his exalted position in Washington. A married man would find this hard to do on the wretched salary the government paid him. While the matter was under consideration the Chief of Staff died and soon afterward Hall received his appointment — family and all.

Newcomb's computations showed the satellites to be revolving around Mars in nearly circular orbits situated almost exactly in the plane of the Martian equator. Phobos revolves around Mars in a period of 7 hours 39 minutes, about the same time that Hall had estimated from his early observations. Owing to the slight eccentricity of the orbit the satellite may recede to 5,924 miles from the center of Mars, and come as close as 5,726 miles. Since the equatorial radius of Mars is 2,134 miles, this means that Phobos may come within 5,726 - 2,134 = 3,592 miles of the surface at perigee, which is about the great circle distance between New York and Paris. Phobos revolves so rapidly that to an observer on the surface it would behave in the way we are used to seeing artificial satellites, rising in the west and setting in the east. Deimos moves across the sky from east to west, but so slowly that to a casual observer it would seem to be hanging overhead almost motionless.

Phobos and Deimos are too small to show as disks even in the largest telescopes, so that we cannot determine their diameters from direct measurement, as we can the four giant satellites of Jupiter. The only way of getting at their diameters is by making some assumption about the way their surfaces reflect light. This characteristic of a planet is known as its albedo, defined as the ratio of the light reflected from the surface of a planet in all directions to the total light incident upon it. (This innocent sounding definition of albedo conveys no idea of the complexities involved in its mea-
Uranus has the highest albedo of any planet in the solar system of 0.93; Mercury has the lowest with an albedo of 0.058. The albedo of the moon is almost as low — 0.07. We would guess that Phobos and Deimos have a low albedo, probably less than 0.2.

It is obvious that the lower we make the albedo of a body, the larger the value we are going to get for its diameter. Consider two satellite vehicles in space of identical size and shape, one of which is painted white and the other gray. If both are viewed from the same distance in the same relation to the sun, the white satellite will appear the brighter. To appear equal in brightness the gray satellite would need a much larger reflecting surface to compensate for its darker color (lower albedo). For the apparent brightness or magnitude of Phobos and Deimos we take the values derived by Kuiper from his measures at the opposition of 1956. When reduced to unit distance (1 a.u.) from the sun and Earth viewed at full phase the magnitude of Phobos is 12.1, and that of Deimos 13.3. The diameters of the satellites corresponding to the albedoes of Mercury, Mars, and Venus, come out:

<table>
<thead>
<tr>
<th>Planet</th>
<th>Albedo</th>
<th>Diameter (Miles)</th>
<th>Phobos</th>
<th>Deimos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>0.058</td>
<td>9.8</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td>0.159</td>
<td>8.0</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Venus</td>
<td>0.705</td>
<td>3.8</td>
<td>2.4</td>
<td></td>
</tr>
</tbody>
</table>

It is seen then that the diameter drops rapidly as we increase the albedo. If we pushed the albedo to nearly 1.0 they would shrink to mere cannon balls! Probably diameters of 10 miles for Phobos and 5 miles for Deimos are the best estimates we can make at present.

Phobos revolves so fast that its motion can be detected in only a few minutes. Watching it skirting by the polar cap of Mars under a power of 1000 you get the sensation very strongly that it is not of natural origin, but a station in space launched by the inhabitants of the planet. Obviously such a suggestion if made in Hall’s time would have received a cold reception. Today we are in a more permissive frame of mind. The hypothesis that has always been regarded most favorably, however, is that they are captured asteroids. On the face of it this idea sounds reasonable enough. But when we examine it more closely, it seems as far-fetched as the space hypothesis.

A planet only one-tenth as massive as the Earth such as Mars could not easily effect a capture. Let us suppose that the eight small satellites of Jupiter are captured asteroids. Then Mars only about 1/3000 the mass of Jupiter has done extraordinarily well to have been able to latch onto two such bodies. For the sake of argument we will agree that one of the satellites is a captured asteroid. What a remarkable capture it was! It was captured in such a way that it revolves almost precisely in the plane of the planet’s equator in a very nearly circular orbit. Well . . . maybe Mars made one such capture. But
it seems incredible that it could have effected TWO such highly specialized type of captures. Further speculation along this line is useless. It might make an interesting problem for a highspeed computer.

Proponents of the space-station hypothesis emphasize the unusual nature of the orbits, particularly that of Phobos which is unique in the solar system. But the less publicized Deimos moves in an orbit that is almost as remarkable, since it closely approximates that of a stationary satellite; that is, a satellite with a period of revolution equal to the rotation period of its primary. A comparison of the theoretical figures for a stationary Martian satellite with the known distance and period of Deimos, shows how closely they agree.

<table>
<thead>
<tr>
<th>Orbit of Stationary Satellite</th>
<th>Orbit of Deimos Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean distance (miles)</td>
<td></td>
</tr>
<tr>
<td>14,600</td>
<td>12,710</td>
</tr>
<tr>
<td>Period (days)</td>
<td></td>
</tr>
<tr>
<td>1.265</td>
<td>1.026</td>
</tr>
</tbody>
</table>

Another feature of interest about the satellites that seems worth mentioning, is the puzzling discrepancy between the optical and dynamical "flattening" of Mars. This important characteristic of a planet is defined as,

\[
\text{Flattening} = \frac{\text{Equatorial diameter} - \text{Polar diameter}}{\text{Equatorial diameter}}
\]

The flattening gives us valuable information about the internal structure of a planet; whether it is about the same density from surface to center like the moon, or whether most of its mass is concentrated in a dense central core like Saturn.

To determine the flattening of Mars seems almost too easy. Some night when the seeing is good take micrometer measures on the equatorial diameter of the disk and on the polar diameter. Then compute the flattening. Actually the measurements are extremely difficult, due to phase, the polar caps, atmosphere, etc. Except for a few extreme values, however, the values for the flattening of Mars determined by optical methods are in surprisingly good agreement, the mean being 0.013, which is about four times the flattening of the Earth.

An entirely different way of determining the flattening is from the perturbations produced by the planet's equatorial bulge on the orbits. The dynamical flattening derived from an analysis of the perturbations of Phobos gives the value 0.0052. Thus there is definite agreement between the optical and dynamical values for the flattening of Mars which is much larger than can be attributed to errors of observation. There is at present no completely satisfactory explanation for this discrepancy.

Enthusiastic supporters of the artificial origin hypothesis contend it is even possible to fix the approximate time when the space stations were put into orbit. It will be recalled that Professor d'Arrest of Copenhagen searched in vain for a satellite of Mars at the close oppositions of 1862 and 1864. Then
at the opposition of 1877 Hall found two satellites. Why didn’t d’Arrest find them? Obviously because the Martians didn’t put them into orbit until sometime between 1864 and 1877. D’Arrest didn’t see them because they weren’t there yet. (Or because his telescope was incapable of showing them.) If it hadn’t been for Mrs. Hall they wouldn’t have been there in 1877 either.

GULLIVER’S MOONS: INVENTION OR REALITY?

There is another problem connected with the moons of Mars that has mystified people ever since Asaph Hall discovered them. Was Asaph Hall their discoverer? Or were they discovered much earlier — not by an astronomer — but by the Dean of St. Patrick’s Cathedral in Dublin and the author of Gulliver’s Travels? We refer, of course, to the uncannily accurate information about the two satellites of Mars which Jonathan Swift seemed to have in his possession in 1726 when the book was published that made him famous. On the surface Gulliver’s Travels is an agreeably interesting account of Captain Lemuel Gulliver’s adventures among the pygmies of the land of Lilliput, the giants of Brobdingnag, and other strange creatures. Gulliver is a conscientious reporter who describes the most amazing events in a matter-of-fact style, with scrupulous care to avoid exaggeration of statement and to get all the details just right. Swift was especially successful at inventing minutia to lend authenticity to his narration. He was so successful at it, in fact, that after 250 years we are still in doubt as to whether some of it was invention. It is ironic that Gulliver’s Travels which is one of the most devastating satires on the human race ever written, has been generally regarded as a book for children — a nursery classic!

Gulliver sets out on a trip to the East Indies but is soon driven far off his course by the inevitable storm and finally ends up being set adrift in a small canoe by some Pyrates from Japan. Shortly before encountering the Pyrates he had gotten a fix on the sun which put him in Lat. 46°N, Long. 183° (presumably what we would call 177°E today). This locates Gulliver in the North Pacific some 500 miles south of the western end of the Aleutians, which is certainly one of the blankest spots on the map. The captain sights an island in the air which hovers over him and turns out to be inhabited. The inhabitants hoist him on board with a chain and thenceforth begins his adventures on the island of Laputa.

The Laputians are far ahead of Europeans in many respects especially in astronomy. We are told that their astronomers have “… likewise discovered two lesser Stars, or Satellites, which revolve about Mars; whereof the innermost is distant from the Center of the primary Planet exactly three of his Diameters, and the outermost five; the former revolves in the Space of ten Hours, and the latter in Twenty-one and an Half; so that the Squares of their periodical
Times, are very near in the same Proportion with the Cubes of their Distance from the Center of Mars; which evidently shows them to be governed by the same Law of Gravitation, that influences the other heavenly Bodies.”

Let us compare the known facts about the satellites of Mars with the information supplied us by Swift. Since the Laputians had not gotten around to naming the two moons yet we shall for convenience refer to them as the Inner Moon and the Outer Moon. Notice that Swift gives their distances from the planet in diameters of Mars. Why didn’t he give them in miles? All he needed to do was to look up the diameter of Mars in some book, multiply it by 3 and 5, and that would have been it. But in 1721 when Swift started work on Gulliver the diameter of Mars could not have been known in miles. Astronomers of that time had a fairly accurate knowledge of the scale of the solar system in astronomical units, or the distance of the Earth from the Sun*. They knew that Venus was 0.7 astronomical units from the Sun; Mars was 1.5 astronomical units; and Saturn about 9.5 astronomical units. But they didn’t as yet have a reliable value for the astronomical unit in miles. Astronomers are still working on this problem. The average of several recent determinations including radar echoes from Venus give 1 a.u. = 92,910,000 miles. Swift might have given their distances in a.u.’s but instead he adopted the understandably simpler procedure of expressing it in diameters of Mars.

Swift knew that it was not enough just to toss off the information that Mars has a couple of moons. To make his yarn believable he has to give more information about them. So he gave their distances from Mars, and decided to have the inner moon revolve in a period of 10 hours and the Outer Moon in a period of . . . But wait a minute. He couldn’t have the outer moon revolving in any old period he liked, or he would get into trouble with Kepler’s Harmonic Law of planetary motion. That is what Swift meant when he remarks that “. . . the squares of their periodical times are very near in the same proportion as the cubes of their distances from the centre of Mars . . .” This law may be written out as,

\[
\frac{(\text{Period Outer Moon})^2}{(\text{Period Inner Moon})^2} = \frac{(5\times \text{Diameter of Mars})^3}{(3\times \text{Diameter of Mars})^3}
\]

There is no escape from the conclusion that Swift must have had to go through the calculation for the outer moon,

\[
(\text{Period Outer Moon})^2 = 5 = 462.7
\]

which when you take the square root gives 21.5, very closely. Since Swift was a highly educated man such elementary arithmetic would have been easy for him, although his principal training was in literature and history.*

---

*Strictly speaking the astronomical unit is not the mean distance of the Earth from the Sun. The astronomical unit is defined through Kepler’s third law when the constant, \( k \), has the value \( 0.017202 \) assigned to it by Gauss.
covered the Naval Observatory was able to announce a value for the mass of Mars that was more accurate than Leverrier's. (Which, incidentally, was very close to the mark.)

It should be emphasized that this was the most important result that came out of the discovery of the satellites: the accurate determination of the mass of Mars. It's nice to know that Mars has a couple of cute little bodies going around it. And it was of value to know this in relation to hypotheses of the origin of the solar system. But it was the mass of Mars that was of most value to astronomy.

We can also use the data Swift gives us about the Inner and Outer Moons to obtain the mass of Mars. It will be fun to check up on the old boy. Here are the values his Moons give for the mass of Mars compared with those derived from Phobos and Deimos.

<table>
<thead>
<tr>
<th>Distance (Diem. Mars = 1)</th>
<th>Phobos (Hd)</th>
<th>Deimos (Hd)</th>
<th>Inner Moon</th>
<th>Outer Moon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.366</td>
<td>3.421</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Sidereal Period</td>
<td>7h39m</td>
<td>30h18m</td>
<td>10h00m</td>
<td>21h30m</td>
</tr>
<tr>
<td>Sidereal Period (days)</td>
<td>0.31891</td>
<td>1.26244</td>
<td>0.4167</td>
<td>0.8958</td>
</tr>
<tr>
<td>Mass of Mars (Earth = 1)</td>
<td>0.1067</td>
<td>0.1079</td>
<td>0.654</td>
<td>0.655</td>
</tr>
<tr>
<td>Adopted value today</td>
<td>0.108</td>
<td>0.108</td>
<td>0.108</td>
<td>0.108</td>
</tr>
</tbody>
</table>

Thus the values for the distance and period of the satellites found by the Laputan astronomers give a value for the mass of Mars that is about 7 times too big. It is disappointing that it was so far off. But it was nice trying, anyhow.

Before abandoning the case, how-

"Swift must have liked arithmetic. He says that Laputa "is exactly circular; its Diameter 7837 Yards, or about four Miles and an Half, and consequently contains ten Thousand Acres." My figures give 9966.5 acres of 43,560 sq. ft.
ever, let us give it one more try. Suppose that when Swift said “dia-
meter of Mars” he really meant “radius of Mars.” This is an easy
mistake to make as everyone knows who has done much computing.
Swift might have made such an
error in the manuscript and failed
to catch it in proof. Or... perhaps
... he wrote “diameter” for “ra-
dius” deliberately.

Why?

For some perverse reason known
only to himself, Swift is one
of the most enigmatic personali-
ties of major importance in English
literature. His tremendous intellect
is apparent from his political writ-
ings. But when his emotions were
involved we try to follow the reason-
ing processes of his brilliant mind
in vain.

We proceed to make this change
in the distances of the Inner and
Outer Moons, leaving their periods
unchanged, and calculate the mass
of Mars anew. Now we have the
following:

<table>
<thead>
<tr>
<th></th>
<th>Phobos</th>
<th>Deimos</th>
<th>Inner Moon</th>
<th>Outer Moon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance (radius Mars = 1)</td>
<td>2.732</td>
<td>6.842</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Sidereal period (days)</td>
<td>0.31891</td>
<td>1.26244</td>
<td>0.4157</td>
<td>0.8958</td>
</tr>
<tr>
<td>Mass of Mars (Earth = 1)</td>
<td>0.1067</td>
<td>0.1079</td>
<td>0.0818</td>
<td>0.0819</td>
</tr>
<tr>
<td>Accepted value today</td>
<td>0.108</td>
<td>0.108</td>
<td>0.108</td>
<td>0.108</td>
</tr>
</tbody>
</table>

Now Swift’s moons give a mass
of Mars very close to the present
accepted value; in fact, the agree-
ment could hardly be better. What
does it mean?

Dare we gu

Jonathan Swift at 21 was in
what used to be known in a polite
age as “reduced circumstances.”
Upon the advice of his mother he
went to reside with a distant kins-
man and elegant courtier at his
estate at Moor Park. Life, under
the conditions he was forced to
endure there, would have been in-
tolerable to a man of his tempera-
ment, had it not been for a little
bright-eyed girl of eight years, the
housekeeper’s daughter, to whom
he acted as tutor. Because she was
associated with a famous man she
is still known to the world today
under the name she used to be
called—“Stella”. Stella was glad
to be tutored by Swift and soon
came to love him. The tender feel-
ing that developed between these
strangely contrasting personalities
lasted the rest of their lives. After
reaching womanhood Stella was
Swift’s dearest friend, and perhaps
his wife. The exact nature of their
relationship has never been solved.
(As if it were anybody’s business
but their own.)

Perhaps at Moor Park, Swift ob-
tained a telescope from one of the
wealthy friends of his kinsman,
which he and Stella used in their
studies together. What could be
more delightful than learning to
know the stars with someone you
love? Many amateur astronomers
do it today. There were some close
oppositions of Mars about the time
Swift was in residence at Moor
Park in 1687. Swift and Stella met
in 1688. They would certainly have
turned their telescope on that flam-
ing red star that outshone all others
in the summer sky. One night when the seeing was so good as to be described only as fabulous, they glimpse two tiny star-like points of light barely discernible in the glare around the planet. On the following nights they find them again in slightly different positions.

Stella gazes at them with wondering eyes.

“What are they?” she asks the young man by her side.

“They are satellites,” he answers.

“Satellites?”

“Moons . . . two lesser stars of the planet Mars.” He kneels by her side, taking one of her hands in his. “They are ours, Stella. One for you and one for me. Promise me you will never tell . . .”

They keep the secret between them. Time goes on. They are no longer young. There are moments when Swift wonders if he should reveal their secret to science. About 1721 at the age of 54 he starts writing *Gulliver's Travels*, the work that is destined to make him famous. In recounting the marvelous researches of the astronomers of Laputa it occurs to him: Why not have them discover the two moons of Mars? He recalls that Galileo announced his discovery of the phases of Venus in an anagram, as did Huygens his discovery of the rings of Saturn. Swift decides to tell about the moons but to keep just a little bit back. And so he leaves some mystery lingering about them by doubling their distance from the planet.

*Gulliver's Travels* was published in 1726. Two years later Stella died. After she was gone Swift began a decline which ended in senility by the time of his death in 1745 at the age of 78.

What a sad and fascinating story it makes! Only I don't believe a word of it. My only reason for writing it is that if I don't somebody else will.

The chief objection, to cite only one, is the incontrovertible fact that previous to 1726 there was no telescope in the world big enough to show the satellites of Mars. How large would such a telescope have to be? That is hard to say. Although many amateurs have fine reflecting telescopes up to around 10 inches aperture I know of none who have been able to sight Phobos and Deimos. Thomas R. Cave, an experienced amateur astronomer and professional telescope maker, tells me that under good observing conditions he has seen the satellites with his 12½-inch mirror, and once with a 10-inch of long focal length. My own observing has all been with the 60-inch and 100-inch reflectors on Mount Wilson. I would say that the moons of Mars are easy to see when you can see them. They are either there or not there.

But there were no reflectors of 10 inches aperture in Swift's day, and the achromatic refractor was still in the future. The early 18th century is a barren period in the history of the telescope. There is no record that Swift ever had a telescope. If he had only lived a century later it might be possible to connect him with an instrument.
capable of revealing the satellites. But then he and Stella would never have met . . .

How then can we account for the uncanny accuracy with which he foretold the existence of the satellites? In my own mind I am convinced it was not due to any advance secret information, or clairvoyance, or ESP, or anything of that sort. He did it by pure chance. It's as simple as that.

Agree?

∞

For the benefit of readers who may be interested in making calculations about the satellites of Mars of their own, the mass of Mars is found from the equation,

\[ M + m = \frac{4\pi^2 a^3}{R^2 P^2} \]

If for the Gauss constant we take the value, \( k = 0.017202 \), then

- \( a = \) semi-major axis of orbit in a.u.'s
- \( \pi = 3.1416 \)
- \( P = \) period in days,
- \( M = \) mass of Mars in terms of the mass of the Sun,
- \( m = \) mass of satellite in terms of mass of Sun. Since the mass of the satellite is insignificant we can without sensible error put \( m = 0 \). The data needed for calculating the mass are:

<table>
<thead>
<tr>
<th>Satellite</th>
<th>a (km)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phobos</td>
<td>9,365</td>
<td>7h39m</td>
</tr>
<tr>
<td>Deimos</td>
<td>23,525</td>
<td>1d6h18m</td>
</tr>
</tbody>
</table>

1 a.u. = 149,500,000 km

Mass of Earth = 0.000002999 x mass of Sun

Diameter of Mars = 6868 km.

Mass of Mars = 0.108 x mass of Earth

---

**Starts in the January IF!**

**STARCHILD**

Startling Novel of Adventure in Space

by Jack Williamson and Frederik Pohl

In the same big issue

A New Retief Story by Keith Laumer

THE RECON MAN by Wilson Tucker

—and many more!
THE DEAD ONES

by SYDNEY VAN SCYOC

The hospital was superb. It could cure any injury at all — even fatal ones!

Victor was bent at the controls of his constructor when the viewphone blurred and Lyra's features came, too large, to the screen. Her voice was piercing.

"Victor? Oh, Victor — Mr. Hallers just called. They were moving a piece of gearing at the plant and one of the chains snapped and Daddy —"

"How bad?"

She shuddered. "I don't know. Mr. Hallers said the nurse came right down but she wouldn't let him near or even tell him. And now I've got to tell Mother — but what?"

"You've called the hospital?"

She shook her head forlornly.

"Mm." He considered. "All right. You go to your mother's. I'll call you there when I find out how bad it is." His hands found the controls. She didn't go.

"What is it, Lyra?"

Her voice rose. "Victor — Mr. Hallers thinks he's dead!"

"Nonsense!" he snapped. "Go to your mother."

Her eyes clung. She cancelled the circuit.

Frowning, he sent the constructor grumbling crossgrounds. When it was parked, he made his way to the construction office. Masters, behind his desk, offered a coffee cup.

Victor declined. "My father-in-
law's had an accident. I've got to get hold of the hospital and then give Lyra a buzz."

Masters' heavy face creased. "Sure. Look, use the lot booth just outside. Tell the operator I said to give you an outside line."

Victor nodded distractedly and turned. Then he turned back. "Masters, tell me. If one of us got himself pinned under a section of walling, who would you notify?"

Masters raised an eyebrow. "Why, the company nurse. Who else?"

"And if it wasn't a two-minute job lifting the walling and taping Humpty Dumpty together again, would she let the rest of us pitch in and help?"

Masters frowned. "Well... she'd have to call for the safety office to block off the scene. And then she'd send for an ambulance crew—whichever company the fellow was insured with. They'd use their own equipment to get him out."

"In other words, no."

Masters sighed. "No," he agreed. "Look, it used to be the company hired its own nurses. Then the insurance people stepped in. They'd sponsor nurses jointly—pay the salaries themselves. The only catch was, each nurse had to have full authority any time there was a emergency." He lifted his shoulders. "You can see the point. No use letting a bunch of amateurs break a man's back trying to save his arm."

"Um," Victor said, and eased to the door.

It wasn't until he had folded into the viewphone booth that he real-ized Lyra hadn't given him the name of the hospital. He leafed the directory and found Mercy, the hospital nearest Carrigan Metals, where Jonathan Krueger worked.

"Jonathan Krueger?" The clerk who answered consulted a list. "I'm sorry. We have no Krueger listed." A second screen burred and she reached to cancel Victor's circuit.

"No, wait," he insisted. "It was an industrial accident half an hour ago. Put me through to Emergency."

"One moment, please." She murmured to the other screen, then turned back and a second list. "I'm sorry, sir. If he were in Emergency, I would have his name. Perhaps City or St. Mary's." She moved again to cancel.

"And perhaps Emergency hasn't gotten around to totting up a new list."

"Sir—"

But he insisted and, exasperated, she switched him.

Three nurses, a clerk and one irate doctor later, he cancelled the circuit. Jonathan Krueger had not been taken to Mercy.

He glowered at the directory, shut and heaved it. The booth was musty. He glared out its transparent sides.

Finally he retrieved the directory and punched again.

The Carrigan switchboard robot gleamed. "Carrigan Metals."

He stated his request. The robot gleamed and faded.

Victor's screen lit with an ancient, birdlike countenance. "Yeah?"

"Haller's, I've called all the hospitals and can't locate Jonathan. I
thought you might have some idea where he's been taken."

Haller clamped his lips into a beak and scrubbed his chin, considering. "Well, don't like to say it, Victor. But Jonathan didn't look in such shape as any hospital was going to help." His eyes glittered shrewdly. "I was right beside him when it happened. Pure luck it didn't get me too, but I gave a leap to break all records. Then that busy-body foreman wouldn't let me back near, nor anybody else. And the nurse was no better."

Victor's voice was sharp. "No matter how bad it was, he should have been taken to a hospital."

Haller glittered. "Well, wasn't me that masterminded it. Lyra told her mother yet?"

"She won't say anything until we have definite news."

"Well, after I get off shift, I'll get Mother and stop by the house. Only decent thing. Worked with Jonathan sixteen years, near."

Sighing, Victor cancelled.

Outside, he shoved his hands into his pockets and tried to think. Finally he made his way to the gate and rented a motor scooter from the stand.

He let the scooter's drone die when Carrigan Metals rose before him in gray, fuming piles. The gate, when he reached it, was clogged with workers. The guard saw that Victor wore no corporation badge and waved him to one side.

When the spate of workers had eased, Victor wheeled the scooter forward and offered personal iden-

tification. "My father-in-law was injured in the accident this afternoon. I want to see the nurse."

The guard grunted and retreated into the guardhouse to his view phone. When he had completed several calls, he returned, spread a map on the counter and outlined Victor's best route. "The door with the blue cross. She'll be expecting you."

Victor returned his salute and set crossgrounds. Reaching the main corridor of the complex, he relinquished his scooter to the rental agent and caught a scooter-bus to the elevator banks. After lifting, he caught another bus, which took him past the door with the blue cross.

The nurse turned from a low cabinet. She was perhaps fifty, motherly.

"Victor Fiske. I want to know why my father-in-law wasn't taken to a hospital," he demanded.

Her forehead creased. "Why, there was no need, Mr. Fiske. I examined Mr. Krueger myself. He'll be home by six o'clock."

He quirked his lips impatiently. "Look, one of his co-workers — no one else, incidentally, has taken trouble to notify the family — saw what happened. Jonathan won't be home tonight at six, or ever. Let's have the story."

She shook her gray curls unhappily. "Please, Mr. Fiske, you must understand. In cases like this there is always someone who will interfere and cause the family needless anxiety. That's one reason we insist — "

"And I'm sure I speak for the
entire family when I say it's your policy of deliberately concealing facts that's causing anxiety. Let me have it, will you? Without sugar candy."

"But of course he will be home at six. You see —"

Angrily he clamped her arm with his fingers. "Look, I've had enough. Just tell me, with no further evasion: what has happened to my father-in-law?"

She frowned. "Why, Mr. Fiske — I thought you knew. He was crushed beneath a piece of falling gearing. I examined him myself. He will be home at six o'clock."

He stepped back, his fingers still steeld at her arm. He stared, unwillingly. It took him moments to realize why he couldn't look from her face.

She returned his stare with frowning concern. Her eyes continued to blink at regular intervals.

He thrust her back so abruptly that she stumbled. But the timed, mechanical blinking did not falter, neither then nor as she pulled herself up. "Mr. Fiske —"

But he was through the door and pounding the corridor. It wasn't until he narrowly missed head-on collision with one of the scooter buses that he allowed himself to lean against a wall, panting, to try to assimilate what he had seen.

*People don't blink their eyes that way, at regular intervals.*

*Do they?*

He caught an employee bus, took the elevator to ground level, rented a second motor scooter and returned the way he had come, to the west gate.

He rattled the glass at the exit side of the guardhouse until the guard opened for him. "The accident this afternoon — did you see what kind of ambulance was sent?"

The guard rubbed the back of his neck. "Had to be one of the insurance wagons," he offered. "Carriage doesn't hire unless you got insurance."

Victor twitched angrily, his own insurance tag heavy at his chest. "Yes, of course it was an insurance wagon. But from which company?"

The guard pondered. "I tell you, I got people coming in and out all day. Scooters, supply trucks, the washroom people. Then an ambulance on top of that —"

"Okay, skip it." Viciously Victor gunned his scooter into the intersection. But traffic was too heavy through the industrial section for him to vent his anger in speed.

When he reached the Krueger house in the far suburbs, Lyra's eyes were too large at the door. Inside he could hear the dry crackle of Mr. Hallers holding forth.

"I suppose you told her," he said.

Lyra's features gathered defensively. "She already knew something was wrong, Victor, when I came and just stayed." Her voice rose. "And then Mr. Hallers came with his mother and started saying how terrible it was, after sixteen years, and —"

"What did you say to her?" he hissed. Beyond he could see Mr. Hal-
lers and the huddle on the couch beside him, white-haired and shrunk-en, his mother. Mrs. Krueger didn’t seem to see him from her chair.

“Why, just that there’d been an accident, and we didn’t know how bad. But Mr. Hallers thought —” She broke off and frowned up at him. “Victor?”

Scowling, Victor sank into a chair. “I spoke to the nurse at Carrigan, and she gave me a lot of syrup. Which company was he insured with?”

She still frowned, following the complication of her own thoughts. “Why, Western, of course. No, I guess we didn’t mention it, did we? But after the wedding we thought that since your father —”

“Victor?” she demanded again, following him to the kitchen and to the viewphone mounted there.

He punched from memory, waving her to silence. When the switch girl appeared, he said, “This is Victor Fiske. My father, please.”

“Victor!” His father’s face broke happily.

Victor did not return the cordiality. “I want to know what has happened to Lyra’s father. He was injured at Carrigan this afternoon and taken in a Western ambulance. I can’t trace him to any of the hospitals.”

His father’s suited shoulders fell. “I’ll send down a query.” He turned from the screen briefly, then turned back. “By the way, Victor, don’t forget your check-up next week. Or Lyra’s the week after.”

Victor regarded him coldly. “You know, I’ve just been wondering what would happen if I were to go to a private doctor instead. One who could examine me without leaving a four-hour gap in my memory.”

His father frowned. “You know very well. We’d have to cancel your policy.”

Victor nodded. “You know, that gap really hadn’t bothered me until this afternoon.”

His father tried to laugh under his gaze. “Well, frankly, I doubt you could locate an unaffiliated physician in this day and age. Most graduates come directly into one of the companies.” He seemed to consider further elaboration, but a voice murmured behind him and he turned.

When he turned back, he held a yellow memo. He smiled broadly. “Jonathan will be released in half an hour. I’ll coop him home myself.”

Victor stared.

His father laughed. “Surprised? We’ll see you in forty-five minutes.”

He cancelled.

Lyra’s eyes had followed Victor’s involuntarily to the time-spot above the viewphone. The hands said five fifteen. “Which will make it exactly six o’clock,” Victor said, and began to laugh joylessly.

Lyra frowned. “But Victor! — I think it’s wonderful.” She hurried to tell the others.

“Well, shows you things aren’t always as bad as they look,” Hallers philosophized as he handed his mother to her feet. “Glad Jonathan’s gonna be all right.”

Victor stared incredulously. “All right? Look, Hallers, surely you see there’s something wrong. Jonathan
can’t walk in that door forty-five minutes from now, not as badly as he was hurt just two hours ago.”

HALLERS cackled. “Now, son, just an old man’s eyes. Sorry to run, but don’t want Mother coming over weak.”

VICTOR glared, then, angrily, caught his arm. “Look, HALLERS, you were there. You saw with your own eyes.” But VICTOR’s eyes had strayed to MRS. HALLERS.

She doddered. Her eyes, clear despite age, blinked. Again. And again, with regularity.

VICTOR’s arm dropped.

“Well, tell Jonathan I’ll see him at the plant.”

But VICTOR had already sunk to the front step, holding his sides, unable to stop laughing.

Of course! MRS. HALLERS and her stroke five years ago. A miracle she had recovered, hadn’t LYRA said? At her age. And wasn’t it touching, how solicitous HALLERS was of her?

Oh, VICTOR saw how it could be done. How it probably was done. Wasn’t this the day of super-miniaturization? Wasn’t this the day when any working part of the human body could be duplicated?

But of course it wasn’t just one part that was duplicated. That would only leave the others still vulnerable, susceptible to breakdown.

No, undoubtedly somewhere there were walls of files and in each file jacket a listing of parts. And elsewhere, undoubtedly, bins of parts. And assembly rooms. So that when necessity arose, everything could be assembled with minimum delay.

And the key to the deception unquestionably lay in the fact that no one really wanted to question that the person who returned at six for supper was the same person who had left in the morning.

Years before, when his mother had finally been taken from the room where she had lain wasting, he had faced the fact, without being told, that he wouldn’t see her again. But four days later, when he had come from school to find her smiling and healed — had he questioned?

had he wanted to question?

He did not realize how long he had stared into darkness until the smooth beat of his father’s autocopter died on the lawn.

LYRA and her mother hurried past, then reappeared with JONATHAN KRUGER’s tanned smile between them. AUSTIN FISKE gave VICTOR a private, questioning glance and KRUGER sent him the usual quick wink.

But VICTOR did not return the wink, or the handclasp that followed. Because JONATHAN KRUGER, returning from death, did not blink his eyes with the androidal regularity VICTOR had anticipated.

AUSTIN FISKE caught VICTOR’s shoulder. “Let’s leave them, hey?”

Inside he laughed at VICTOR’s uncomprehending frown. “Well, you’re hardly the angry young man I spoke to earlier.” He clattered cups from the cabinet and helped himself to the coffee maker.

VICTOR pulled himself from his thoughts. “No,” he admitted. “I—”
"You formed a theory, an unsettling one," his father said for him, measuring into the coffee maker. "And just now, outside, it fell on the blink of an eyelash."

Victor stared. "How did you know?"

His father laughed. "Because we've just perfected the unit that corrects that particular flaw." He plugged the coffee maker.

Victor's frown was even more uncomprehending. "But then — "

Austin Fiske shook his head. "No, you didn't imagine it."

Victor scowled. "Of course it's fraud," he said finally, flatly.

His father laughed. "Oho, someone else hasn't looked hard at his policy. You'll find that Western, in addition to requiring all attention be given by an affiliated doctor, also retains the right, in case of death, to make a suitable substitution." Of course Joe Doe assumes that means that if the doctor assigned his family dies, we retain the right to name the substitute doctor." He shrugged. "Deception, yes, but at least the family isn't broken up."

Victor's voice was cold. "And Western not only doesn't have to pay death benefits, it can go on collecting premiums from the deceased! But tell me, what about the man who's so badly hurt it's obvious he'll be helpless for the rest of his life, but not so badly he can't make it?"

His father didn't meet his eyes.

Victor laughed. "Yes, I suppose you have a lot of trouble with traffic tie-ups, and attendants who aren't as careful as they could be."

His father studied the counter-top.

And what about the man who is going to take months about dying? I suppose you arrange a send-off as soon as you know he's incurable."

His father's head snapped up. "Our closed wards — "

But Lyra had entered, eyes shining. "You needn't stay back here," she protested. "We want you to get your mother, Victor, so we can have supper." Then she saw she had interrupted. "You will bring her, won't you?"

She left at Victor's nod. He turned to his father. "Well, shall we go get our android, so we can eat? She has been dead all these years, hasn't she?"

His father seemed to shrink. "You can't say you really regret what was done."

"No," Victor admitted. "I guess I only resent finding out at all that she was a mechanism, only doing what she was programmed to do."

His father shook his head. "No, you have to understand, Victor. She's as human as any of us, in her way. I don't understand completely myself. It's the complexity of the programming, the fact that she's had to duplicate a human so closely that for all practical purposes she is one. You can't put a label, human or machine — it isn't that simple."

Victor stood. "No, she's one or the other. And you don't want to see which." He raised a hand to his father's protest. "Oh, I won't
tell Lyra about her father. But I'm going to cancel our policies. And I'm going to start dropping hints. I won't say it outright. But a hint here, a hint there, and maybe people will begin to see. Then the whole thing can stand or fall on its merits." He paced. "For myself, I'm not buying. I won't leave myself open to someday being given a machine for a wife — and being too weak to send it back and face facts."

His father sighed. "No, Victor, I'm sorry. You can drop all the hints you want. You can come right out and denounce us. But no one else will see what you see. No one who matters."

Victor eyed him coldly. "You see, we've had to make certain suggestions to our policy holders, during the memory probe we make during regular examinations. We've had to be sure that people see what we want them to see and nothing beyond." He shrugged. "Call it manipulation, inter-

ference — it's there and there's no way around."

For a moment blood rushed in Victor's ears. Then it died, forever. "But I saw!" he protested.

His father's smile was bleak. "You let yourself see. Circumstance forced you to let yourself."

"Let myself?" Victor's voice was harsh, from the edge of a deep emptiness.

His father shrugged. "I can't say I'm sorry. It hasn't been easy, letting you go on ignoring the truth while I've had to live with it myself."

"The truth?" But of course it had been there all the time. He had just had his head turned, resolutely refusing to see.

"Oh, I didn't do it for myself, not at first," Austin Fiske said, shrinking, his shoulders hunched. "You see, your mother knew that you were the only child she could have. But she never learned that you died at birth.

**Mankind was dead — and their robot heirs hunted their murderers! Read TO AVENGE MAN**

by Lester del Rey

Complete in the December Galaxy

*In the same issue:*

**THE STARSLOGGERS**

Harry Harrison

**MAN OF THE RENAISSANCE**

by Wyman Guinn

— and many more!
It was clear and windy in Chicago, and the copters on the roofs of the buildings were tied down. Maude Hennessy shuffled down the hall of the top floor of the towering Boyd House, carrying an empty coffee pot. She grumbled about the stranded copter passengers on the roof and their demands for freshly made coffee. Maude Hennessy stopped and wrinkled her nose. Very faintly in the air there hung a smell, a sick, filthy smell, one she had smelled before. She glanced around wildly, looking at the doors of the apartments. All looked normal. She sniffed harder, and hobbled over to the nearest door and thrust her nose into the corner. Nothing. She crossed the hall and did it again.
The smell seemed stronger so she sniffed all along the crack, and then she was quite certain. She grabbed the doorknob.

It was so hot she burned her hand. She snatched it away and stepped back and began to scream. She stood in front of the door that carried the small gold nameplate, Frank Addison, and she screamed in a cracked broken falsetto, over and over, with a sobbing intake of breath every few seconds that was even more racking than the scream.

Doors began to fly open and people ran out into the hall. Maude Hennessy ignored them when they ran up to her; she simply stood in front of the door and screamed. A man stepped up to the door and tried the doorknob. He jerked his hand away and turned and said, "My god somebody's burning. Call the fire department. Quick. Will you shut up!" This last to Maude Hennessy.

A big woman in a torn housecoat put her arm around Maude Hennessy and led her down the hall and into an apartment. Her screams still rang softly through the closed door. Several people dashed back to their own apartments to phone. The man who had burned his hand called the building custodians and told them what was happening. "Yeah apartment 9648, Frank Addison. Faint smell in the hall, doorknob too hot to touch. It's pyrophilia, all right. You guys better stay until the fire department gets here. The place might catch on fire." He hung up and hurriedly dressed and went back to the hall.

A crowd had collected, and soon the building crew arrived. They moved people back away from the door and began mounting men with thermocouples above, below, and on each side of the Addison apartment, all linked with the radio. The reports came in one at a time. "Temperatures normal on outside floors, walls, and ceilings."

In forty minutes the fire department first appeared. Their copters swooped out of the sky, ignoring the wind, making fast landings near a stairwell that had been marked by the custodians. Three copters came in first, and men spilled out and headed down the stairs dragging a thin, white hose behind them. One of them held an air hammer to the door just above the doorknob and pushed a button. There was a roar of sound and the door snapped open.

A wave of hot fetid air rolled out of the room and swept down the hall laden with a greasy soot. It struck the watching people crowded at both ends of the hall. They reeled back, gagging. Many of them retched. One of the custodians nodded his head at them and said, "See? See? That's why we wait for the fire department I told you to get back."

The men in the white suits went in through the door and entered the living room. Over near the window was a stuffed chair, smoldering and smoking. Some elongated charred embers lay in front of the chair, and the men in white closed in on them. They pressed the valve on the end of the hose, and liquid nitrogen
spurted out. It flashed into vapor and roiled the air in the room. Streamers of the greasy soot soared violently, sticking to anything they hit. Festoons of soot hung from the ceiling and the walls, and a yellowish, thick, stinking liquid dripped slowly down the walls. The blistering, hot air was almost unbreathable without the masks.

A squat man in white ran in and leaned over the embers on the floor. The man with the hose said to him, “They’re about out, Chief. Basket coming down?”

Chief Edwin Cook said, “Yes. Turn off the juice. Al, see if they’ve stopped burning. They are good big specimens if we can keep them.”

The two men bent over the fragments while the others crowded around. Cook reached out a hand and said, “I don’t feel any heat. Maybe . . . wup, there they go. Get the juice on again.” The fragments had suddenly begun to glow near the charred regions just above the ankle. The stream of nitrogen quenched them. Cook said, “Get me the Dewar flask.”

Two men brought up a shiny cylindrical tank, one of them handed Cook a pair of tongs. As he placed the fragments carefully in the flask, an anatomist, bending forward to see, said, “The ankle bone, the arch, and all the toes, with a small piece of the shin bone. Yes, good specimens.” He looked up at the others.

Cook straightened and looked around at the room. One of the men who had been prowling along the walls came over. “Nothing out of the ordinary, Chief. Seems like a typical case of pyrophilia. See anything unusual?”

Cook shook his head. “Well, let’s give it the usual treatment. Get the Inquiry Section going on the victim’s background, put the chemists and biologists to work in here, keep a couple of medics in the building for awhile to see if anybody else gets it. I’m going back to Washington. See you there later.” He waved and left.

They stood around the long, mahogany table, leaning on the chairs, but not sitting in them. They talked softly to each other about things that didn’t matter, waiting. Then he came in. They straightened, and there was a chorus of “Good morning, Mr. President.” They waited until he seated himself at the head of the table before they found their seats.

The President wasted no time. He turned to Philip Wood, Secretary of Health, Education and Welfare. “I understand there was another case in Chicago this morning, Phil. That right?”

“Yes, Mr. President. Just like most of the others. The fire department got there right away, but we haven’t learned anything new about it, at least not yet.”

The President turned to the Secretary of State. “Charles, how is pyrophilia running in other countries? Any change?”

“No, sir. The rate in the advanced countries is about the same as ours. In backward countries the rate is less, but it is increasing.”
He turned back to Philip Wood and said, “What could possibly be done that isn’t now being done?”
“Nothing that I can think of, sir.”
“Can anybody think of something else?”

The Postmaster General spoke up. “More laboratories, more people on the problem. Give it everything we’ve got.”

Philip Wood sighed. “It’s not just a question of more and more, Fred. We’ve already got so many people working on it we can’t keep track of them. Pyrophilia has more money and people poured into it right now than any project ever tackled before in this country.”

“But I thought we might . . .”
“Thank you Fred,” said the President. He turned to Wood, “Can you think of anything, anything that might help. Look, our people are getting ready to panic. We must stop this—this disease.”

There were dark circles under Wood’s eyes, and his cheeks were hollow. He said, “I’m going to pull another man in, a fellow I’ve known for a long time. I don’t know maybe . . .” His voice trailed off.

“Pyrophilia is a national disaster, our most pressing problem. It must be solved, and soon. I don’t see how one man can help you, but do what you have to. Now, about that Chinese sinking . . .”

II

David Angler sat in the sun in the cool, Colorado air and watched the clouds form. He looked over at the inviting shade at the other end of the porch. A little later he might move there, but it would be too cool now. That was one of the best parts of living in Colorado; good and hot in the summer sun, and good and cool in the summer shade. With a sigh of contentment he looked back at the sky. He caught a flash of reflected light off in the distance above the peaks. He frowned at it.

Aircraft did not often come to the mountains around Leadville. He watched it come closer, and when he saw that it was a jet copter, his frown deepened. He knew then that it was coming to him. “Oh damn,” he said aloud. This would ruin his two hours of sitting. It would probably ruin the rest of the day, too. It would take him several hours to regain the placidity of mind he needed to take up his work. He sighed and wondered if others had to put up with such interruptions; it sometimes seemed as if Reevaluation of the Nature of Mathematics would never get written.

The copter put down in the clearing, and David Angler bent his lean frame and walked in under the jet-tipped blades as soon as the power was cut. Philip Wood stepped out, and Angler’s face lit up.

“For me for breaking in on you like this, Dave, but I wouldn’t interrupt you if it wasn’t important. You know that.”

Angler smiled at him. “I didn’t think I wanted to see anybody, Phil, but I forgot about you. What’s a busy man like you doing out in the hills? Nothing but trouble for me, I’m sure.”
Wood's smile faded and he said, "Yes, Dave. Nothing but trouble for you. But it has to be that way. Let's get out of the sun."

Wood turned to the pilot. "Anything you want, Bill, come on over to the cabin." He took Angler's arm and steered him across the grassy plot as if he owned it.

Wood was a tall man, heavy in the shoulders, and beginning to thicken at the waist. Angler was thin all the way down. His height was a little greater than Wood's. Both of them walked easily and loosely. They were very much alike except in the face. Wood was a ruggedly handsome man with broad features and an easy smile. Angler was somber. He seldom smiled, and his finely chiseled features made him look sharp and hostile. He was more relaxed with Wood than with most other people. No one could long remain tense with Wood; he radiated easy good nature and friendship.

From their days at Penn together these two had remained close friends. Wood, the extroverted lawyer and the expansive politician, Angler, the introverted student and the secluded logician.

They pulled chairs together on the shady side of the porch. Angler said, "How is Bea? The children?"

"All well, thanks. You have anything lined up yet?"

Angler winced and shook his head. "Why should I get married when I'm not yet forty? I'm a busy man."

"I'm going to set you up for a wife yet."

"Never mind that nonsense, Phil. What brought you out here?"

Wood sat back. "It has now become apparent — to me, at least — that we need you very badly to help solve our number one problem."

"Pyrophia?"

"Pyrophia."

Angler looked at him and said, "Would you mind explaining?"

Wood leaned forward. "Dave, this disease is worse than we have admitted, and the rate of increase is far greater than we have said. Yet even concealing the extent of the problem, people are beginning to panic. Too many people have friends or family who've burned. Each person thinks the disease is worse in his own region than it is somewhere else. You can see where that leads us. In time they'll find out what's happening, and I don't know what will happen then. I'm afraid it'll make the panics that went with some of the old plagues look like a school picnic. The disease in another six months will be killing people at the rate of 200 per hundred thousand."

"I know nothing of the statistics of diseases."

Wood shook his head. "The rate is absurdly high in this age, way out of proportion. Along comes this disease at a time when we should be able to say that diseases are almost a thing of the past."

Angler rubbed his chin. "I wonder if there's a correlation."

Wood sat back. "Dave, I don't know, but our people haven't been able to find any. We wondered if
the elimination of other diseases might not somehow have stimulated this one. Nothing has shown up."

They sat quietly, each looking out at the far slope of the mountain across the valley. Angler said, "But why me, Phil? You have the best logicians in the country working with you and your computer groups. You’ve got Hand and Rosetti, Early, Stephens, Asp and Charles." He ticked them off on the fingers of his left hand. "All I could add is a little more weight."

Wood looked at him affectionately. "Dave, old boy, you are a boor and a nuisance when you have to move around among people. But whenever you turn that mind of yours to a problem, I don’t care who is working on it, you add more than mere ‘weight’. So let’s not take that view."

Angler shook his head at him without feeling the slightest bit hurt or pleased. It was a quirk of Angler’s. He was unable to respond to insult or flattery of any kind. He noticed the degrees of truth or falsity in a statement, and that was all. The emotional implications did not affect him.

Wood leaned forward, suddenly very serious. "Let me put it as bluntly as I can. We have put everything we have on this job, and it is not enough. The fire department has our best medical doctors, our best biologists, epidemiologists, chemists, physiologists, anatomists, mathematicians, physicists, logicians, biophysicists, and you name it. We’ve given them everything they could ask for in the line of equipment and assistance. We’ve let them follow the wildest schemes as well as the staid programs. Yet with all this they are no closer now to solving this pyrophilia than they were ten years ago. Does that mean anything to you?"

Angler rubbed his chin, and nodded. "Yes, it suggests that they are overlooking something, failing to make some kind of correlation, something like that."

Wood sat quietly.

"But there is no particular reason to believe that I can do what your statisticians can’t. If they can’t isolate the most fruitful regions for study, I certainly won’t be able to. Your people must have learned something about it."

Wood sat back and waved both hands in the air. "Oh, we know a few things, all the things that aren’t the slightest bit helpful in learning anything about the disease. Look, I called off to you some of the skills we’ve got working on this. Do you see what is missing?"

"Supervision."

"In a sense. But the trouble with a supervisor is that he has supervision on his mind. I think we need someone to wander around and observe everything we are doing without worrying about supervision. And that’s where you come in. I’d like to have you check us out and see what we’re doing wrong. I can’t believe that we are really not making headway against a disease that started back in the fifteenth century and has grown more prevalent ever since."
"You don't need me. There are others. I have important work here."

"Dave, I hope you will believe me." He placed a hand on Angler's knee. "There is no more important work to be done anywhere than this. The President, all of us, are completely convinced that if we don't solve the dilemma of pyrophilia within the next year, the human race is—well, if not doomed, at least it is in for an enormous setback. I don't like to be melodramatic, but I believe that we are in serious trouble. Something has been nibbling at the human race for five hundred years, and it is finally getting the best of us. Now." He sat back again. "You approach a problem in a way all your own. I've seen what happens when you're around. Things kind of fall apart. I don't worry that you're not a chemist or medical doctor or anything. You are a problem solver, and we have a problem, a very bad problem. See?"

"Um." He rubbed his chin. "Have you put historians to work on pyrophilia to trace back everything that has been said about it in the old days?"

"Yes. We have compiled a biography that will surprise you. Some of the old references are useful in that they recognized the disease as a terrible problem. Others of them clouded the situation by hysterically suggesting all sorts of wild things. Someone once wrote an article about a 'cinder woman'. But late in the twentieth century deaths became common enough for people to take the disease seriously. It has been under close scrutiny ever since. Ever seen what's left of a victim?"

Angler shook his head.

"Pretty terrible. Charred extremities, if anything. Fragments of hands and feet, greasy soot on the walls and ceiling, putrid oil, that's about all. No way for a human being to die."

"Why not?"

Wood did not bother to answer. He knew Angler well, and such comments did not require an answer.

Angler said, "All right. I'll drop what I'm doing here. What about the money?"

"I can put you on as a special consultant and I can pay fifty-five thousand a year."

"Phil, I can't maintain what I've got going on that. Unless... Can you pay living and traveling expenses on top of that?"

Wood said, "Yes, we'll swing it."

"Good. Who heads up the fire department?"

"Wilton Chambers is Director."

"Fine. I'll show up at his office the day after tomorrow and let him know that I'm starting in as an observer. Then I'll... what's the matter?"

Wood was sitting there shaking his head, a rueful expression on his face. "My good friend," he said. "You do not walk into somebody else's organization and announce that you are there to observe him to see if he makes mistakes. He'll find some way to nullify you. 'Observer' indeed. Please tell him you are there to get his help on a logi-
cal approach to the solving of disease problems, a field in which you have no experience whatsoever. Will you tell him that?"

"But that's not the reason."

"For me, Dave. Will you ask his help just because I'm asking you to do it that way?"

Angler muttered, "Politicians! Yes, I'll do it the way you want."

Wood sat back and said softly, "I can see it's going to be a long cold winter."

III

"Why certainly, Doctor Angler, we'd be very happy to help you out in your studies. I think you've come to the right place, too. The statistical approach to diseases is a highly specialized field, and I venture to say that we here at the Pyrophilia Research Institute know as much about it as anyone." Wilton Chambers smiled at Angler.

Chambers was a round-faced man with a carefully combed shock of silvery white hair. His complexion was pink and clear and his hands were pink and white. His smile was lopsided in a deliberate way, and he moved his hands and body with a calculated briskness. "Anything you need," he said, "anything at all, you be sure and let me know."

Angler nodded at the man, puzzled that he should be so easily misled by a few mere words.

Chambers said, "Have you worked out an itinerary to follow while you are here at the Institute, or would you like to have me work one out for you?"

Angler shrugged his shoulders. "I haven't thought much about it yet. One of your groups deals with statistical analysis exclusively, doesn't it?"

"Yes. Here's the way we break down." Chambers leaned back, stared at the ceiling, and placed the tips of his fingers together. "The Pyrophilia Research Institute is made up of four divisions. The —"

"Yes, I know that. And don't most people call it the fire department?"

Chambers continued as if Angler had not spoken. "The first of the four divisions is the Statistics Division. Here are carried out a continuing statistical analysis of the conditions surrounding each occurrence of the disease, plus an analysis of the characteristics of the victims to establish significant correlations."

"What correlations?"

"Various ones. The second of the four divisions. . . ."

Angler realized with surprise that Chambers did not understand the work of the Statistical Division.

". . . is the Laboratory Division. Medical, biological, virological, bacteriological, physiologica, and many other kinds of work are done here, all of it leading toward identification of pyrophilia. Then we have the Transport Division. This has the responsibility for seeing that all our equipment is in the right places at the right time. And last but not least . . . " Chambers chuckled and looked down momentarily at Angler, " . . . we have our Situs Division." He looked back up at the
ceiling. "This is made up of a series of teams, from the technical divisions. They try to arrive on the spot as soon as a victim is reported. They examine the scene minutely seeking clues as to exactly what might have happened. And that's our little group, Doctor Angler. We try to operate as a well-knit team."

"Little group? I understand you have over twenty thousand people."

Chambers smiled deprecatingly. "Twenty-three thousand eight hundred and," he leaned forward and glanced at a piece of paper on his desk, "eighty two, to be exact, and we ought to be exact, eh?"

Angler looked at him in disgust, and then looked away, wondering where to start. He said, "I think I'll check in with your Statistics Division first. Who is in charge there, and where is it?"

"Joseph Marcionis. Fourteenth and Abelard. I'll have you taken over in a car." Chambers ushered him out before Angler fully realized the interview was over.

"There's no doubt about it, Doctor Angler, we have the finest staff and equipment it is possible to assemble." The ring of sincerity in Doctor Joseph Marcionis's voice eliminated any possibility of bragging. "We are confronted with the most subtle of statistical problems in the analysis of pyrophilia. I constantly have the uncomfortable feeling that our best will not be good enough, but we keep trying. You know the feeling, I'm sure."

Angler nodded. He did indeed.

"Well," continued Marcionis, "as we walk around here and I describe what we are trying to do, perhaps you will be good enough to point out anything that seems to you to be anomalous."

"Be glad to," said Angler before he remembered what Philip Wood had asked him to do. He quickly added, "I'm just here to learn, however, to see if I can pick up some techniques."

"Certainly," said Marcionis without looking at him, "and we will see to it that our reports of your visit describe all you have been learning from us. But nevertheless we are familiar with some of your papers," he looked at Angler full in the face. "If you notice anything, we would very much appreciate hearing about it. We don't put stuff like that in our reports anyway."

Again they looked at each other, and Angler felt much better about the caliber of management at the Institute. He should have known, he thought to himself. The job usually gets done, even in government, despite the deadweight heaped on the shoulders of the few capable men around. They strolled off together.

Angler grew more impressed as the day wore on. The statisticians, logicians, and computer technicians in the Division were dedicated men, fully aware of the nature of the nearly insolvable problem they had. Angler knew several of them personally, and several more by reputation. Most of them knew Angler, and he noted how carefully they avoided asking why he was there.
Charles Early explained the location statistics. "We can’t put our finger on it, Dave. Occurrences of the disease in this country have a random basis, modified by population density, further modified by past occurrences, season of the year, age distribution, and by half a dozen other lesser parameters. If we could ever tie these factors together, we might know something. It is the most elusive problem I’ve seen."

Angler nodded. "With all you’ve brought to bear on the problem, it is almost as if some intelligent opponent were at work against you."

Early said, "This same suggestion has been made in the past. Back in the 1950’s, an anthropologist, name of Krogman as I remember, suggested probably in jest—that the consuming of people by a kind of ‘spontaneous combustion’ suggested intentional reduplication. Nobody paid any attention. So nothing is really new."

They completed the tour and rejoined Marcionis. Angler held out his hand. "Thank you for everything, doctor. Point me in the direction of Transport, and keep me posted. If I run into anything, I’ll let you know."

Marcionis called a copter, and Angler rode to the outskirts of the District, out to the rolling fields of Virginia where the main base of Transport was located. He went through it quickly to get a rough idea of the facilities. He had the impression that a great many people were at work studying trip sheets, requisitions, and papers that some-one nearby had issued. All of them were filling out a great many forms in heptuplet. He did not know anyone there, and no one knew him. He stayed an hour and went on to Laboratory.

Doctor Robert Berman had heard of him and was glad to meet him. In a short time they were on a first name basis, and Angler had seen a competently run technical laboratory. Angler listened as Berman briefly ran through the various projects and studies under way. It was an impressive list, and Angler could not think of anything that was missing. He stayed at the laboratory until dark, and then went back to his hotel room.

There was a message for him to call Philip Wood.

"Well, Dave. You seem to have have made a good impression on just about all the people in the fire department, all the ones that count anyway."

"Word gets around. You got spies?"

"Everywhere. Tomorrow you’ll meet Edwin Cook. I am particularly anxious to know what you think of him. Give me a call about it when you get a chance—as soon as you get a chance. Okay?"

"Sure Phil. Why all the mystery?"

"No mystery. Just let me know. See you, boy. Good luck." He hung up. Angler shrugged his shoulders and went to bed. He slept soundly.

Next morning he caught a jet copter to St. Louis. Edwin Cook was there at Situs Division. Angler introduced himself.

Cook said, "Yes, Joe Marcionis
called and told me you’d be with us. I’ve heard of your work, Doctor Angler. Tell me,” he stared keenly into Angler’s eyes, “exactly what is it you are looking for on this tour of yours?”

Angler, a direct man himself, was nevertheless disconcerted by the directness of this man. Cook was short, thin and wiry. His face was lined and seamed, and he moved with quick jerky motions. He jumped at the slightest unexpected sound, and it was obvious he was a man drawn tight as the skin on an apple.

“Well,” said Angler, “I’m just trying to find . . . .”

A muted bell began droning repeatedly through the building. Each clang of it had an odd persistence; the sound hung in the air. Angler had never heard it before, but it raised the short hairs on the back of his neck. The man who was designed for that tone knew his work well.

Cook stepped to a sound box, depressed the switch and said, “Where is it?”

“Denver. Tabor Street, number four four eight two, apartment. Scouts are on the way.”

“Good. Get the units into the air.” He turned to Angler. “You know how to work a radio?”

Angler nodded.

Cook said into the speaker. “Tell Frank I’ll take another operator. Have him go with Mark’s unit.” There was a click, and Cook was heading for the door, talking as he went.

“Come with me, Angler. You run the radio in my copter. You might just as well see how we operate from the very beginning. There’s a possible case now. We’ll check it out.” He was half running as he talked.

“We get so many false alarms on these things that we can’t afford to commit all our forces until we know there is a real case. There go the scouts.”

He pointed to two tiny, fast Bandit model copters that seemed to leap into the air, fold their blades, cut in the jets, and head off toward the northwest. “Some of the rest of us go airborne, but we aren’t totally committed until we get the word from the scouts that there is an actual case to fight.”

Figures trotted from a variety of buildings toward half a dozen copters of various models. As he ran, Angler noticed there was no noise, no confusion, no excitement, despite the great activity. It did not take a trained eye to see that this was a highly skilled operation.

“We move in a more leisurely pace,” said Cook, “toward the fire until the scouts land and establish that we are needed. We sacrifice extreme speed, but we save unloading our people and gear. Too many times we used to answer a false alarm, and then a real case would catch us committed to the wrong site. This way we increase our average speed over a few months time. Band six is the scout band, band eight is the general operational band. Stand by them, will you?”

They were airborne.
There was room for just three in the copter; the pilot, Cook, and Angler. Although Cook had said they would move at a leisurely pace, Angler saw that they flew fast compared with a family copter. Ahead of them police copters cleared a lane, and the air was filled with flashing, brilliant red lights. They were aloft for thirty minutes when the message came from one of the scouts.

“A real one, Chief. Quick, the feet are left.”

Cook snatched the speaker from Angler’s hand as he waved the pilot ahead. They sank deep in the cushioned seats as the copter accelerated. Cook said into the microphone, “Plan two, plan two. See if you can save it.” He handed back the microphone and sat back. “We will get the liquid nitrogen in as fast as possible. You might just as well watch; never mind the radio now.”

Ten minutes later Cook pointed, “There. There’s the building. See if you can think of a way to improve this operation.”

Angler leaned toward the port and saw a pulsing ball of red light on one of the buildings below. One of the accompanying copters pulled ahead of them, dived toward the marked building, and ran out the hose toward the men waiting on the rooftop. When the nozzle reached them, the waiting men seized it and ran with it through the roof door. Then their own copter was down on the roof and Cook was out and running. Angler loped after him. They followed the hose down three flights of stairs and down a hall and saw it pass through the door of an apartment.

Angler went in through the door, not knowing what to expect. The hose stretched through a tastefully furnished living room and into an adjoining room through a doorway in which hung a broken door, hanging on its hinges. Without thinking, Angler raced through the door.

A wall of hot, fetid air enveloped him. He breathed it, and the foul smell of it caught at his throat, gagging him. He gasped and staggered to a wall and put his hand on it and then leaned against it. He became violently sick. During the paroxysms he made his way to the door and back out to the living room. He sat in a small chair, hunched forward, holding his head in his hands, trying to bring himself under control. The room rapidly filled with people, each of whom went about accomplishing some particular job after throwing a sympathetic glance at him.

Angler straightened. His hand was covered with a greasy soot, and as he saw it, he gagged again. He rubbed his face with the back of his hands and stood up. He forced himself to walk to the door of the bedroom and look in.

He watched the group work in the sooty room as they tried to extinguish the two small black objects that lay in front of a partially burned chair. Two men came in carrying a jar into which they dropped the foot remnants. Teams took
soot, air and oil samples. Others were photographing everything that went on.

Cook moved in and out of the room, getting other teams of people started on their jobs. It was Cook who noticed that Angler was the only man in the area without a mask. He grabbed Angler’s arm and ran him out to the hall. “You should have a mask in there. It has not yet been proved that pyrophilia is not contagious.”

Angler shrugged his shoulders and said, “Only because nothing has been proved about it.”

Cook did not bother to answer him, but instead, held out an extra mask. Angler nodded and put it on. It was uncomfortable. He stayed and watched the activities a few minutes longer, and then, seeing the pattern, wandered out into the hall and took off the mask. A few frightened people were gathered at the far end of the hall, and Angler strolled toward them. Several broke and ran as he approached, but three men and one woman hesitantly stood their ground. “Live here?” Angler said.

They all nodded, and the woman asked, “Are you a member of the fire department?”

Angler started to shake his head, but then he realized that he doubtless was operating as a full-fledged member of the fire department.

One of the men blurted out, “When are you going to stop this? What are you doing about it? Why aren’t you . . .?” His voice broke, near panic.

Angler stared at him in surprise. It had not occurred to him that anyone could get upset simply because a scientific problem had not yet been solved. The things Philip Wood had told him had been remote conceptions, and panic had not bubbled in his voice.

The second man said, “You’ve got to stop it, mister, you’ve got to stop it. This is no way for a man to die, you hear? You’ve got to stop it.” Again, the voice was frantic.

The woman quietly began to sob. Angler turned his back on them and walked back to the room. Cook was just coming out, and he said to Angler, “We have to get out of here. Our weekly meeting starts in three hours, and you ought to be there to see what they’re like. We can get some sleep on the copter.

They went up to the roof and climbed aboard. As soon as they were airborne, Cook fell asleep. He did it so naturally that Angler got the impression that he was very much used to it. Angler could not sleep, so he watched the scenery go by for two and a half hours. Then Cook awoke. Angler started to talk to him, but Cook gently waved him away and got on the radio.

For the remainder of the trip Cook talked to his people, listening to them report on the week’s work. He checked in with Berman and swapped information with him. By the time they landed Cook was ready for the meeting. Angler did not disturb his thoughts as they rode the elevator to the meeting room at the Institute building outside Washington.
Wilton Chambers presided. The heads of the four divisions were there, each with three or four selected assistants. There was nobody from Cook's division, however.

Chambers briskly got the meeting started, calling on each head in turn to make his report. As the time wore on, Angler saw that Chambers, for all his lack of technical knowledge, was able to sense when a man's discussion got off the track and wandered to immaterial trivia. He would briskly interrupt to ask that that detail be omitted, and ask the man to start again where he had left the main thread of the discussion. Angler was surprised. Chambers made a good chairman.

The talk droned on about the statistics of the disease, the victims, the cities in which the disease appeared, and a dozen other parameters. Then the talk turned to chemistry of the human body. One of Berman's assistants spoke of the chemistry of the liver, and while he did so he frequently mentioned the name Parker. He spoke the name with some distaste, yet he found it necessary to repeat it often. Angler gathered that Parker was an able chemist, but hard to get along with. Other names kept intruding in the same manner; two physicists got the same treatment.

Angler hardly listened to the report of the Transport Division. Its head insisted on trying to describe every nut and bolt tightened during the week, and Chambers constantly had to push him along. The meeting lasted five hours.

At the very end Chambers said, "Gentlemen, I have just received word from Mobile that a seventeen year old youngster has been consumed by pyrophilia. The principal of the youngster's high school has announced that the school will be closed for the week while they fumigate. Some mothers have announced their intention to keep their youngsters out of the school from now on." He sat and stared at the paper. The rest of them looked at him in silence.

Angler remembered the panic in the voices of the people he had talked to, and his blood ran cold. For the first time he understood what Wood had meant. They got up and filed quietly from the room. Angler and Cook headed for their copter. Cook rubbed his hands over his face before they climbed aboard. He rubbed his face hard, and kept his hands there longer than he should have.

Angler said, "How long has it been since you've slept in a bed?"

Cook dropped his hands and smiled tiredly at Angler. "I don't even remember any more. But bed doesn't seem right to me somehow, with these poor devils dying this way. Do you realize Dave," they climbed into the copter, "that we don't really know a single solitary thing about this disease? We haven't got a start. All we ever get are a few fragments of charcoal, and that isn't enough. Why does the disease always seem to strike late at night when nobody's around? Why?"
Why?” And Angler, shocked, recognized the same touch of panic he had heard before that day.

They sat quietly, and Cook finally waved at the pilot to go. The two men sat without talking long after they were airborne.

The radio crackled to life. “Another one of those reports, Chief. Some guy says he’s sure he’s got pyrophilia and is soon going up in flames. Just making a record of it.”

“All right,” said Cook tiredly. “Let me know if anything happens. That’s all for . . . wait a minute.”

Angler had grabbed his arm and said urgently, “Wait a minute.” Then when Cook stopped talking Angler continued, “Do you have many of these reports, Ed?”

Cook nodded. “They come in all the time. We have yet to find one that means anything.”

“Let’s go talk to this guy. Where is he?”

Cook started to say something to Angler, changed his mind, and said into the microphone, “Where did that report come from? Akron? What’s the address? Got it. Out.” Then he said to the pilot, “Go to this address in Akron, Ed. As fast as you can.”

Angler and Cook sagged back in their seats as the copter leaped forward. The radio warning, the shrill keening of a siren and the flashing red light all clicked on. Air police saw the bright red copter with all its emergency equipment going, and made their way easier. They swooped down to the roof of the great building. Angler and Cook got out and ran for the door. An elevator was waiting and they rode it down to the fifty-first floor and then ran down the hall to apartment 51244.

Cook tried the door. It was locked. He pounded on it shouting, “Open the door. This is the fire department. Open up.”

Angler felt gooseflesh. “We’ve got to break in, quick.” He stepped back and kicked out at the door next to the handle.

Cook said, “Wait,” and took a bundle of keys out of his pocket, tried one and opened the door. Angler rushed into the room first. Angler tried another door; it was a closet. Cook arrived at the one remaining door with him and they threw it open and went into the bedroom together.

A man lay on the bed struggling to get up. He reached a sitting position and held his hands to his temples. He seemed to be fighting an overpowering urge to sleep. He yawned constantly and groped his way to his feet, stood up unsteadily and began to walk toward them. His mouth worked, and he stopped.

An ecstatic look came on his face. He dropped his hands and suddenly began to perspire. Perspiration seeped from every pore. It ran down his face and dripped off the end of his nose. Wet spots appeared under his arms and rapidly spread until in a few short seconds the man stood in clothes that were completely saturated with water. The euphoric look was still on his face when his knees began to buckle.

He fell to his hands and knees
and the water dripped from his cheeks to the floor. He pitched forward on his face. Angler and Cook shook off the spell that had rooted them to the floor.

Cook grabbed the man’s shoulders, turned him over, and took his head in his hands. “My god, he’s hot.” He loosened the clothing and felt for a pulse. Shaking his head at Angler, he lifted an eyelid and looked at the man’s pupil.

Angler pointed to a spot near the man’s abdomen. Steam seemed to rise from it, and as they watched, the cloth dried. The dried spot slowly spread. Cook’s jaw sagged and his voice was hoarse. “This must be it.”

In the center of the dried spot a brown color appeared, a small dot at first, but it too spread rapidly. Cook touched it with his finger, and snatched his hand back, gasping. Flames appeared.

A crackling, glowing, bright red ball of fire replaced the center of the brown cloth. It threw off sufficient heat that Cook and Angler turned their faces away and moved back. Stringers of soot rose from the miniature holocaust and danced toward the ceiling on fast rising currents of hot air. The fire quickly spread over the entire chest, making a clearly audible hissing sound. The room quickly filled with fetid, foul-smelling, very hot air. Angler and Cook were forced back away from the body. Angler looked at Cook and said, “How can we stop it?”

We can’t. Liquid nitrogen will barely bring it under control. I’ll call the rest of the boys.” Cook made a quick call from the phone near the bed, and then stepped back and watched the body burn.

Angler said, “Ed, we can’t just watch this happen. We ought to be able to do something to help understand...” He turned and ran out of the bedroom and into the tiny kitchen, grabbed up a carving knife from a drawer, and ran back to the bedroom. He knelt alongside the body shielding his face with an arm, turning away to avoid as much heat as he could. He worked on one outstretched hand, and he was surprised at how hard it was to remove it. But finally it separated from the wrist. He rolled away, his clothing smoking.

Cook took the knife and ran around to the other side of the body. In two minutes he had the other hand, but they could no longer breathe the air in the room. They retreated to the living room. Cook removed a cover from a cushion on the couch and carefully wrapped the specimens in it. He said, “We will have to watch them to see if they burst into flame.” They both sat down, limp, exhausted, sick.

It was fifteen minutes before the fire department came, and the men immediately went into their usual routine. Angler and Cook watched them. Angler looked over and saw the defeat in Cook’s face.

It was as if Cook spoke out loud: what’s the use of all this cleverly arranged routine that finds nothing, proves nothing. Cook slowly got up and headed toward the door. Angler followed, carrying the specimens.
Out in the hall Angler said, “Don’t let it get you down, Ed. We’ve got these specimens. They may tell us something.”

Cook rubbed his hands over his face. “That’s one of the things that bothers me. Here we’s got just about the most highly tuned organization in the country to dig out information on pyrophilia. You come along, and on a hunch — on a lousy hunch — you lead us into a situation where we learn more than our highly tuned organization has in ten years. We saw a man go under with pyrophilia. *We saw it.* On a lousy hunch.” His voice cracked.

Angler put a hand on his shoulder and said, “Been like that through much of the history of technology. No different here. No reason to fight it. We made a big stride today.” He dropped his hand and stared at the wall and continued softly, “And I think we are about to make more big strides. Yes, I think we are.”

Something about the way he said it jarred Cook. Cook looked at him and thought about the quietness of the flat statement. And the thing in Cook that made him come here on this wild goose chase in the first place, now made him say, “All right, Dave. What next?”

“I think we better go back to Washington. Yes, let’s go back to Washington and see if anybody can learn anything from these specimens. And maybe, just maybe, we ought to have a little party. Yes, it’s time, I think, for a little party.” His voice was low.

Cook said, “Let’s go, then.” And he turned to lead the way. For the first time they became aware that the building resounded with human voices and shouts and an occasional scream.

“Wonder what that’s all about,” said Cook. The elevators were out of order, and it was a long walk up. Cook went back to the room and rounded up a radio and called for information.

“It’s a riot, Chief. Half a dozen people are running around too. We’re not equipped to handle this. I was getting ready to call in the police when you called. Any instructions?”

Cook shook his head at the microphone in his hand. “No, Charlie. Call in the cops. All we do is put out fires, we don’t quell riots. Good luck. Oh, and Charlie. Get these elevators working. We want to get out of here.”

Cook sighed and turned to Angler. “Getting worse. Getting worse all the time. Let’s go.” He led the way back to the elevators. They were operating again, although the shouting and screaming were louder.

Seated in the copter, Angler said, “Well, Ed. It seems pretty clear to me that your whole organization is working the wrong way.” Angler was so preoccupied he did not notice the look of anger that flashed to Cook’s face. He continued, “You’ve got good men, men who won’t miss things, if the things are there to be found. It must be that there is nothing there, or something that is so subtle, even your men would miss it. So we must be going
at it the wrong way. We're doing it backwards, that must be it. We're doing it backwards." Cook's face softened as soon as he heard Angler say "we."

"What do we do about it?" said Cook.

"We get together with some intelligent people who don't know much about it, and we make some guesses."

"People who don't know much about it? Why?"

"Because most major advances have been made by non-experts in the particular field. They're not afraid to think up theories that the experts know are wrong. Remember that old saying: it ain't what we don't know that hurts us, it's what we know that ain't so. An expert has a terrible time breaking out of the wall he's had to build around himself. Some do it, but not many. I think you've got a staff of many thousands of people accumulating information at a prodigious rate, all of it valuable. But we've got a terribly urgent problem to solve, and we cannot afford to accumulate valuable information until the solution finally tumbles out. We've got to solve the problem and explain why later."

Cook was shaking his head. "If anybody but David Angler was talking like that, I'd say he was some kind of a nut. Do you really think a few amateurs can solve a problem that has stopped the best of them for ten years?"

Angler said, "Let's try." He said it in that odd, flat tone of voice
that Cook was beginning to recognize.

The pilot broke in by turning on the radio speaker. Another burning, Omaha, followed by a panicky closing of the schools, and appeals by the mayor to Washington to do something. Cook kept close track of the work of the fire department as they moved in, but nothing new turned up. He was about to sign off when another burning was discovered in Mobile. The copter came down at the Institute before that one was handled. Cook reluctantly left the copter to go with Angler to see Chambers.

Chambers' secretary asked them to wait since Chambers was talking on the phone. Angler shook his head at her and walked in anyway. He looked around the plush office, and it dawned on him that it seemed as if a hundred years had passed since he had sat across from that desk and listened to Chambers tell him about the organization of the Pyrophilia Research Institute. It had been only yesterday.

Chambers looked at Angler and Cook in disbelief as they strode in. He had a phone in his hand and he said into it, "One moment, please." He covered the mouthpiece and said to them, "Get out of here. I'll send for you when I'm done."

Angler said, "You're done right now. Put the phone down so we can get some work done for a change."

Chambers gaped at him, gasped and turned livid. He said into the phone, "I'm sorry, senator. I've had two people break into my office. May I call you...?" He listened and sputtered, "I know, senator, I know. We are doing the best we can, and we hope to make a break through at any moment. I know it's getting worse. Look, I'll call you back and give you our latest results in half an hour. Yes. Yes. Good-by, senator." He slammed down the phone and leaped to his feet, sputtering. "I—"

Angler interrupted, "We want an order from you giving us a nice comfortable room. Keep us supplied with lots of good food and plenty of whiskey, and send in half a dozen people we name. We want this done now."

Chambers scooped up the phone again and said, "Get me Secretary Wood. This is an emergency." He said to Angler, "I think you have caused enough difficulty around here, Mr. Angler." He pointedly refused to say "doctor." "I understand that Secretary Wood himself appointed you to this... this information seeking job you are on, so I will... yes, Mr. Secretary?" This last into the phone. "This is Director Wilton Chambers at the Institute. This man Angler is causing a great deal of confusion and he is obstructing our work here at the Institute, so I am about to order him off the premises... What?... Yes, here he is." He handed the phone over to Angler. "He wants to talk to you."

Angler took the phone and said, "Yes, Phil." He listened a moment. "I have an approach that may cut through all this nonsense, and I want to try it." He listened again,
looked at Chambers, and said into the phone, "Oh, no. I don't think it'll be necessary to throw him out. He runs a pretty good meeting, I was surprised to discover. Just so long as he does what I want, let him stay on here."

Chambers sagged to the edge of the desk, holding himself up with both hands, staring back at Angler.

Angler said, "I'll keep you posted, Phil. I know what the situation is now. So long." He handed the phone over to Chambers. "He wants to talk to you." Chambers could not take it, so Angler reached over and held the phone to his ear. "Tell him, Phil."

They could faintly hear Wood's voice as he instructed Chambers to give Doctor Angler anything he wanted, and to help him in every way possible, and if he found this difficult to accomplish, then he, the secretary, would look with favor on the immediate resignation of the Director of the Institute, and "Was there anything you wanted to say, Mr. Chambers?"

"N... N... No, Mr. Secretary. I did not understand the situation. I will certainly..."

"You see that Doctor Angler gets everything he wants, and you place behind him all the resources at your disposal, without question or hesitation. Do you have any questions?"

"N... No, sir."

Angler hung up the phone. He was too engrossed in his problem to think about Chambers' collapse. He said to Chambers, "As a start, I want a case of the best Scotch, bourbon, and beer, along with lots of soda, ice, glasses, and some sandwiches, sent to a large room with a blackboard, big comfortable chairs, and some sofas. Then I want... what's the matter?" The look of total consternation on Chambers' face prompted the last question.

Chambers' jaw was hanging open again. "Scotch? Ice? A comfortable room? You mean you're just going to throw a party? Do you...?"

Angler began to frown, annoyed by the constant necessity of explaining everything. He started to snap at Chambers, but Chambers had learned his lesson. He said, holding up his hands, "Oh it's all right. It's all right. It'll be there. Is that all?"

Angler immediately began thinking. "No, we'll want some more. We want you to send in to us, free of all other responsibilities, your chemist Dave Parker and a few others. Ed, are there any other bright young renegades in the other sciences around here?"

Cook thought a moment. "Well, there's John Feigley and the physicists Bob Hager and Nat Newton. Then there's Roth. He's a physiologist, written some good papers which is why we have him, although he gets wild in them. But he's young yet, only twenty eight, so you —"

"Get him," said Angler to Chambers, "and let's get started. We may think of someone else later." He pointed to Chambers and said, "Never be more than thirty seconds away from a telephone where we can reach you. Now, where's this room?"
Chambers said, "There's a nice conference room on the third floor. You remember, Doctor Angler. You were in it."

Angler nodded, but Cook said, "Why settle for that? Let's use the executive conference room. It's a lot more comfortable, and it even has showers in the bathrooms next to it."

Chambers started to shake his head but saw Angler looking at him, and while still shaking his head he said, "Why certainly. What a splendid idea. I'll see that you have the use of it for as long as you want. You go right on up. I'll send for the others and take care of those other things."

Angler nodded, and he and Cook went to the door. Chambers said, "Uh, one thing, Doctor Angler. What, uh, what will you all be doing there?"

"I wish I knew," said Angler, and he took Cook by the arm and led him out the door.

V

It was the most plush conference room Angler had ever seen, and he wondered out loud if any work had ever got done in it. "Yep," said Cook. "This is where the executive branch plans its assault on the pocketbook of the legislative branch. This room has produced more money for research than any other room in the entire history of mankind."

Dave Parker came in while they were still prowling around. He was a plump, soft-looking man, with short, curly black hair. His black eyes snapped and danced as he quickly looked around. "We holding sacrificial ceremonies in here, or something," he said, and Angler liked him. They were shaking hands when a man in overalls brought in a case of Scotch and placed it just inside the door. Parker saw it and said, "This for our meeting?" At Angler's nod, Parker's snapping eyes caught fire. He tossed his coat over a nearby chair, pulled his tie down and unbuttoned his collar as he sat down in one of the chairs. He was just putting his feet up on the shiny mahogany table when John Feigley sauntered in.

Feigley was thin, slow and hungry looking. He could not seem to get a word out as the others said their hellos. When he finally found time to drawl, "We having a party in here?", it seemed to take forever for him to finish the sentence.

Angler wandered over to one of the blackboards to make sure there was chalk there. Satisfied, he dropped into a chair alongside Parker and yawned.

Hager and Newton came in arguing. Hager was the shorter of the two, and he waved Newton quiet and said to the group in the room, "We were discussing what's it all about. I take the position you are going to tell us to get out of the Institute, while Nat here insists you are going to ask us to get out. Who's right?"

"You both are," said Parker. "You are asked to sit down and have a drink, and then you will be told what to do. This is Dave An-
gler, and you already know the chief fireman. Ah, here comes the physiologist, Roth by name, fast by fame, physiology's gift to drag car racing, so let's line him up."

Roth grinned and slapped Parker on the back and said hello to the others. He pulled up his chair and tipped back in it to stretch his long legs. There was a general rumble of conversation until Angler, who had been staring moodily at the table top, suddenly sat up and said. "Oh, are we all here?"

Cook nodded, and Angler said, "Look, this whole outfit has been doing beautiful work for ten years, publishing learned papers, coming up with all kinds of research fall out, and generally building a reputation as the most learned scientific body on the face of the Earth. But it hasn't solved the problem it was created to solve, the most pressing problem we've ever been confronted with. It is my position that the situation is absurd. Something is grossly wrong. Now I don't know what is wrong, but I'm willing to guess. Everybody's too busy collecting knowledge to try to put together a theory of pyrophilia." He sat quietly.

Nobody said anything. They were all looking at Angler reflectively. Looking from one to another, Cook thought that whatever Angler was going to tell them would create more of a stir. A theory of pyrophilia, indeed. These people sat here as if they heard such a demand every day.

Feigley said, "Well, what you
mean, we should put together a plausible theory of how pyrophilia might start and everything, and then test the theory to see if it’s right, and never mind all this studying and gathering of information.”

Angler looked at him wide eyed. “I wish I could have said it as well.”

Parker said, “We can do that. Spontaneous human combustion, analogous to spontaneous organic combustion, a result of air oxidation in a heat insulating and flammable environment. Shouldn’t be too tough.”

The rest were looking at Parker quietly. Hager said, “Wouldn’t take as much heat as you might think to raise a living cell to the combustion point of the organic materials present, but the water would quench it, unless you had enough heat to volatize it. I can calculate that, I imagine. Anybody know what percent of a cell is organic matter?”

“Take eight percent, be conservative,” said Roth.

Hager got up and walked to a blackboard. He picked up some chalk, and stared at it.

Parker said, “Analogous to the burning of a match, too. Lies dormant, strike it, up she goes.”


“Sure does,” agreed Parker.

Cook realized he was sitting on the edge of his chair. Something had slowly been happening in the air in the room. It felt charged, electrified, like the crisp air just before a storm breaks in the spring. He looked around and saw a group of intelligent men sitting with the air crackling around them tossing out random thoughts. In a flash of insight Cook understood something they themselves did not understand. They had a hold on the problem, all of them. And they were groping for a starting point, something they could shove off from, a firm pushing ground. Cook knew with certainty then that one of them would hit something — something that would have the right feel, and then they would begin working at it. The situation had a sense of rightness about it.

Cook felt himself breathe deeply and sit back in his chair and relax. For the first time in five years Cook’s hands hung limply over the arm of a chair. He looked at Angler. There was a man who had understood this all along. Angler deliberately had started out to set this up, and somehow had known exactly the right kind of people to do it with. Cook shook his head in awe.

“And just why in hell not?” The question was directed smack at Cook.

“Oh sorry,” said Cook. “I wasn’t shaking my head at anything you said, Parker. I was shaking it at my own thoughts. What did you say?”

“I said, pyrophilia, with such a great release of energy, must be solely a matter of chemistry. Never mind, the physics, the physiology, the biology, or anything else. It must come down in the end to be solely a matter of chemistry with everything else subordinate. We
need a chemical reaction in the human body to account for it. "Right?" Parker swung around to face the rest.

The room was silent, no one moved. Cook turned his eyes to look at Angler, and saw that Angler was looking at him. Angler winked. The rest of the people looked down, thinking. It was enough. Cook knew they had it, and he saw that Angler knew it, too. It wasn't really much of a statement, but it had probably never been made before. The great research programs had clouded the fact that pyrophilia was simply a matter of chemistry.

Feigley said, "What we've got to do, we've got to find compounds that might exist in the body which can release the required energy. They could release energy by oxidation, although some other mechanism might do. Oxidation is the most likely. Now, what do we have to work with?"

"Oh, brother," said Newton. "There must be hundreds of chemicals in the body." The chemists looked at his pityingly.

Roth said, "There are hundreds in one little corner of one little cell. Boy where were you when the rest of the physics freshmen were taking their required courses in organic chemistry?"

"Sitting with my ears shut, the way you were when you were taking the required freshman course in physics. How are you going to go about listing the compounds that could produce this heat?"

"This is a problem," said Parker. "We could spend weeks just list-

ing possible compounds. Let's just consider the high energy compounds. We don't have time to fool with all the little ones." He was right.

A twenty-three year old man went to bed in Orlando, tossed and turned in minor discomfort for thirty minutes, and fell asleep. At two o'clock in the morning he awoke in acute distress. He threw back the covers to cool himself, but it did not help. He broke out in a profuse sweat, and he felt light headed and giddy, and his head hurt. He got up to get an aspirin and collapsed in the middle of the bedroom floor. In five minutes the center portion of his pajama top scorched and broke into flame. The bedroom filled with drifting strings of soot, and greasy vapors condensed on the walls. He lay on a concrete sub-floor, but the tile on it charred and smoldered. For one hour the hot, smoldering embers burned, and the air in the room grew unbearably hot. The smoke from the charred night table finally drifted out beneath the door in sufficient concentration to attract the attention of a late stroller. The fire department arrived thirty minutes later.

"Well," said Feigley, "I'm not at all sure we ought to stick to the polymers. Many monomers have enough energy. Look at the hydrocarbons."

"Yes," said Roth, waving at one of the blackboards. "That's a nice list of polymers, but we can't overlook some of the smaller ones.
Okay, let’s start a new list.” He walked to a fresh board.

It was Dayton next. For the first time, two people were consumed simultaneously within half a mile of each other. The fire department sent a team to each address, and the computers had an unusual datum to place in the recording banks. But as the word slowly spread through the city that two cases had occurred at once, panic began to creep into the activity of the people. Schools closed, and television houses and motion picture theaters refused to open. People in tram cars moved away from one another, and the stores were three-quarters empty. Radio announcers exorted the people to calmness, but the fear in their voices only fed the panic. People began phoning their Congressmen, the Washington health agencies, anyone with the barest suggestion of authority in his title. The communication net in the city became clogged.

"Ahh, we’re getting nowhere, listing compounds,” said Parker. “We need another approach.”

"Wait a minute,” said Newton. “Let’s pick the one with the highest heat of combustion and see if it has enough energy. Which one will it be?”

“Well, you won’t be far wrong by taking that carbohydrate. Or take cellulose itself. Anybody got a copy of Lange here?”

They sent for Lange and ran off some calculations. The results were

Cook seeing dejection setting in, said, “Let’s have a drink.” They brightened; they had forgotten they were working under unusual conditions. In fifteen minutes they were all sitting around one end of the long table, shooting the breeze.

Angler said, “Who knows the history of pyrophilia? I understand it goes back a long way. Anything there to help us out?”

“I may be able to give you some history,” said Cook. He put his feet on the top of the table. “The earliest reference to pyrophilia — only they didn’t call it pyrophilia then — was a case in Copenhagen in 1692. Next, a French scholar named Le Cat told of a young French girl found consumed in 1725, all burned except a part of the head, a few vertebrae, and a portion of the lower extremities. Notice that? Perfect description of pyrophilia three hundred years ago.” They all nodded grimly. “Next, a case occurred in England in 1744. Another in France around 1750 described in the Encyclopedia Methodique by a French anatomist. England again in 1763 written up in The Annual Register of the Royal Society of London. Two more in France, one of them in 1782 appearing in the French Journal of Medicine, another young woman. Later on, The Saturday Magazine in Britain describes another one, the Countess Cornelia de Baudis Cesenate. This one was so shocking that Charles Dickens tells of it in the preface to the first edition of Bleak House. I wonder why there’s been such a concentration in France and England?”
Hager shrugged his shoulders. "Maybe they report them better, more advanced scientifically, something like that."

Cook nodded. "Well, many of the reports I’ve mentioned tell of other cases, but you can’t check on them. The one’s I’ve described seem to be fairly well established. Then there was one in St. Petersburg, Florida, on July 1, 1951. Same thing. So whatever it is, it’s been around for a long time. But in the last fifteen years it has broken out, and its rate of frequency is increasing."

"Something in people, plus something in the environment," muttered Roth. He swung around to look at the formula-covered boards. "Must be something going on in the body to produce highly inflammable compounds. Say, a diabetic used to produce so much acetone you could smell it on his breath. I wonder if human tissue could become so ketogenic it would support combustion." He got up and wandered to a board and erased it. He put down an abbreviated formula for a carbohydrate and began talking out loud. "Chain scission, plus some oxidation could produce ketones. If the reaction took place in fatty tissues . . ." He began writing. The others got up and crowded around him.

Great Falls learned of a case in its midst when a small solid wood house caught fire. The sprinkler system saved the house but it could not extinguish the smoldering body of Frederic Allen Smith. The people of Great Falls had just learned of the two cases of pyrophilia in Dayton, and they fearfully began going through rooms in their homes every few minutes. They began to make phone calls and soon the communications of Great Falls were jammed.

"I don’t know about that chemistry," said Feigley. "Let’s see. You’ve got this carbohydrate going through five reactions involving phosphorous derivatives and ending up as pyruviv acid. But when you reduce pyruviv acid you are going to reduce the ketone group as well as the acid group. You’ll get a crossed Cannizzaro reaction that’ll produce lactic acid."

"Yeah, under normal conditions. But you may have noticed that something is distinctly abnormal—or subnormal—about a pyrophilia victim. The enzymes may be different. That may be the whole thing right there—the enzyme system."

Feigley said, "I don’t like it; doesn’t look right. How about the energy on that, Newt?"

Newton left what he was doing and joined them. He worked for fifteen minutes and said, "Not enough energy by far to evaporate off in an hour’s time all the water Roth says is in muscle tissue."

"Ahh, well so much for carbohydrates. Let’s take a look at some chemistry of fats. Now, when a fat metabolizes . . ."

There was one in Brazil, two in Libya, three within two hours of each other—in England, one each in Pakistan, Sweden, the Ukraine, and an unconfirmed report of an-
other in Kuzakh. It was too soon to be certain, but the occurrences seemed to be increasing. Governments were hard at work and hoped to have an answer to the problem before it became any more serious.

Parker was asleep in a chair, and Newton dozed nearby. Feigley paced slowly back and forth in front of one of the blackboards, never taking his eyes off it, pivoting his head as he walked and turned. Angler and Hager talked softly about heat loss through body tissue, with Angler asking the questions, and Hager giving his views. Angler nodded to Hager and said to Roth, "Since there doesn't seem to be any reasonable way to get enough energy from fats, either, I wonder if a combination of carbohydrates could produce it?"

Roth said, "Maybe, but these guys have used their imagination on these reactions, and if they can't find a high-energy reaction, there probably isn't one. But you know, I think there must be one here somewhere. In biological reactions, oxygen comes from water, not from air. Maybe we're worrying too much about the water. The fuels are there, too, in the form of the sugars and fats we've already been over. But we haven't yet been able to guess what kind of reaction the fuels feed. Well, I think I'll start fooling around with the proteins. That's about all that's left."

They stood around the long mahogany table, leaning on the chairs, waiting. They talked softly to each other until the President came in. He sat down quickly, and did not even wait until they were seated.

He said, "Phil, I hope you have more than you did last week. I don't have to tell you how serious things are getting. If we don't find the answer to pyrophilia very soon, we will have a national disaster on our hands. We can no longer cope with the demands that we do something; the mail is an avalanche, telegrams can't be organized, phone lines are jammed. We must have the solution. What else do you need?"

Philip Wood wearily ran his hands over his face. "None of us can think of anything we need. We are pulling in information from all other countries. They are all with us as of yesterday; China finally got so worried that it joined the pool. All of us are making a maximum effort with the best scientists we've got and all the equipment and money they need. There just isn't anything else that can be done that our best brains can think of."

"Last week you said something about a man. What happened?"

"He's at work right now. I still think something will come of it."

"One man?" It was the incredulous voice of the Secretary of the Interior.

"You don't know your history," said the Commerce Secretary. "All great discoveries were made by one man. With all due respect to Phil here, I think we are over cluttered — too many people, too much money, too much equipment."
Philip Wood said, "I think you are right, Ed, but the only bad effect of the clutter is waste. We are very, very wasteful, not much efficiency. Well, we can afford the waste. If we waste millions of dollars and thousands of hours of intellectual time to produce one little datum, it will be worth it where pyrophilia is concerned."

"Well," said the President, "I think the time has come when we've got to devote all our time to this. There's no sense worrying about social problems or war scares or Communism when this country and every country is heading straight into chaos from pyrophilia. Phil, suppose you spread out for us just what all your organizations are doing. Let's spend the rest of the day on this and see if we can see some way to get at the problem better. Now . . ."

All of them except Cook and Angler were gathered around one blackboard. "How in God's name," said Parker excitedly, "did we overlook the nitrogen compounds. The human body, loaded with protein, dangling amine groups all over the place, and we fool around with fats and carbohydrates. Brother, how stupid can we be?"

"Well, now," said Feigley, "don't go putting on yourself. That was a logical approach, what with hydrocarbon fuels and alcohols, ethers, esters, and ketones all being pretty good fuels too. But now, this nitrogen idea is a good one, and we
ought to explore it carefully. Keep in mind, though, that the heats of combustion of some of the compounds produced by the reactions we have already looked at are a lot higher than that of some of the nitrogen compounds.

"Yes, yes," said Parker impatiently, "let's start whipping up some reactions here. Now let's see. Adenosine phosphate will supply all the energy we need..." and he was off on a chemical jaunt.

The rest watched him for a moment, got some ideas of their own, and went to their own blackboards and began working out possible reactions. The room again grew silent, punctuated with the sound of scratching chalk, and the grunts of thinking men.

Roth called out, "In case anybody wants to know, the proteins are deaminated to urea. The sequence is adenosine triphosphate plus ammonia plus carbon dioxide ultimately to urea. So you've got the equivalent of free ammonia to work with. It's part of the nitrogen equilibrium in the human body. The nitrogen intake is balanced by the nitrogen output, unless the body is recovering from starvation or something, then it will retain nitrogen."

There was a chorus of muttered humpfs, and the blackboard work went on. The chemistry was complex, and each step had to be verified to see if it were actually a possibility and not in violation of an energy balance or a stability requirement. Several hours passed. Angler and Cook wandered around the room talking softly with the chemists when it seemed advisable to ease the tension.

All the men needed shaves badly, and the circles under their eyes were turning green and puffy. Parker was an eater under stress, and he almost constantly had a sandwich in one hand. Newton was never without a drink, but it did not seem to affect his ability to think. He battered out energy balances as if he had just stepped out of bed. Roth yawned incessantly, and seemed always to be on the verge of going to sleep. Yet whenever a question on the human body came up, he had the answer or a suggestion. Feigley seemed totally unchanged; he might have been working at a mid-morning session on a normal day at the laboratory. Angler was tired and showed it. So was Cook, but the lack of tension in him gave him an easy going air that seemed to make a new man of him. He was bone tired, but he found reserves of energy somewhere just as he had been doing for years.

The first signs of a break through came from Parker. His mutterings grew louder and soon became distinguishable. "I think so, I think I've got it, this looks good to me, this is it, I've got it I think, it going—" He scribbled frantically as he muttered. "I'm sure of it, this is the way, this is what we want, yes this is it."

He finished and stepped back from the board, took a deep breath, and...

Feigley cried out, "I've got it."

The others ran toward him. Park-
er joined them as they gathered around Feigley's blackboard. Feigley pointed to a chemical formula at the lower righthand corner of a blackboard covered with chemical formulae. Feigley shook his head in wonder. "There it is, and who would have thought it."

“What is it? What is it?” the non-chemists could not read it.

“Glyceryl trinitrate.”

“What?”

“Nitroglycerine.”

“Nitroglycerine? You mean like in dynamite?”

“Yup.”

“But people don’t explode in pyrophilia. They burn.”

“Yup. Nitroglycerine burns, too. Got all its own oxygen, supplies plenty of heat, will start by itself if pure enough, oh I’ve got a theory to go with it. But what did Dave get?” He looked at Parker.

Parker stepped back and waved at his own blackboard. He had circled his compound, and even the non-chemists could see it was the same thing as the compound on Feigley’s board. Nitroglycerine.

Angler said, "Let’s sit down and do a little testing. Let’s have Parker explain his views first. Everybody try to find something wrong with what he says.”

They pulled up chairs. Parker said, “Well now, look. I’ve got the chemistry worked out here, and I’ll argue about that all night — by the way, what day is it? How long have we been here?”

Nobody knew. Parker shrugged his shoulders. "Never mind. All right. I’ll whip up a story as I go along.

Let’s see. Pyrophilia’s been around for 400 years, so there is something in the human body that allows the disease to occur when conditions are right. Maybe there is something in the DNA molecule that sometimes begins ordering the construction of proteins that will then go through the sequence I’ve got on the board.”

He waved at it.

"Probably not that easy,” said Feigley. Roth nodded. Feigley continued. "The coded anomaly could occur anywhere along the line, in messenger RNA, in a ribosome, or a polyribosome, maybe even in an entering protein. Maybe the anomaly is in the flesh of an animal we eat, or in a fish, and our metabolic system won’t eliminate it — and then just builds it right in as a template.”

“Might even require a catalyst of some sort, a metallic ion,” said Newton. “In medications, in lipstick, eye shadow, cosmetics, we can find almost any metals we want, many of them in the form of organo-metallic compounds. These compounds and their degradation products can form an immense variety of catalytic compounds. In fact, I’ll bet the initiation of this reaction,” he nodded toward the blackboard, “depends on some rare catalytic occurrence that is growing more common these days,” he shrugged his shoulders.

Angler said, “The interesting thing to me is that you all seem to think pyrophilia starts as a result of some kind of metabolic upset.”
T hey nodded, and Parker said, "Let me go on. The course of reactions starts in some organ—I'll guess the liver," Roth bowed a little, "and goes far enough to form a dilute dispersion of nitroglycerine. Possibly nearby tissues are set up for additional nitroglycerine formation at the same time. It may be that tiny droplets are distributed throughout an appreciable portion of the body, or the precondition may be set up to form droplets. Anyhow. Then at some point and for some reason, the minute droplets coalesce to form a droplet of larger size; nitroglycerine is barely soluble in water, but... hey, that's it. It is soluble in ethers and other oxygenated compounds, so it might well be picked up and collected by a glyceryl ester or something like that, a kind of extraction. That droplet then lets go, and pyrophilia is on the way. Maybe a shock, maybe temperature, maybe a catalyst, it may start as a tiny explosion, or at least as a very hot fire. It spreads through the entire body. Some mechanism drives off the water first, causes the profuse sweating Angler told us about."

They sat and looked at one another.

"Well," said Cook. "It seems like a good theory. Do you suppose it might be right?"

Angler leaned forward and put his elbows on the table. "In ten years' time this is the most advanced clue we've had to go on. There is a good chance that it—or something very much like it—is the cause of pyrophilia. We will make the assumption that this is it. Now, what do we do about stopping pyrophilia in this country?" He leaned back.

Feigley said, "Look here. The body is going to have to produce a lot of nitroglycerine if the body is going to consume itself. Let's figure out how much nitrogen is required. Somebody said something about a nitrogen balance a while back. Maybe that takes us somewhere. If we could see..."

Hager was at the blackboard with Parker alongside him telling him the heat of combustion of nitroglycerine. Somebody said, "You sure that value is right?"

"Yup. The heat of combustion is small; it doesn't relate to the instability of the compound. Here, let me help you." In fifteen minutes they were back at the table.

Roth looked over their figures and said, "I think you were right." He nodded at Newton. "There's so much nitrogen required here that even more than the average daily protein intake would be used up. Yes sir. I'll bet that a potential victim of pyrophilia is not putting out any nitrogen, or at least very little. The whole deamination of protein to urea is interrupted. That's it. Urinalysis. The incipient pyrophilia victim would not excrete any urea. That's how we can find them."

T hey all sat motionless, and Cook could feel the gooseflesh crawl up his back. He shrugged it off. "I'd better pass this information on right now." He started to get up.

Angler leaned forward and said,
"Wait a minute. Once we've found the incipient victim. What do we do to save him?"

Newton said, "That's easy. Just interrupt this chain of reactions." He waved at Parker's board.

"Clear thinking," said Hager.

Parker and Feigley tilted back in their chairs and twisted to see the board. "Well," said Parker. "All those reactions go at the pH of human blood, about 7.4. So if we acidify..."

"Better make it more alkaline," said Roth. "It'll be easier on the system."

"Also," said Feigley, "if we can get an oxidizing agent into the blood, we might be able to stop deamination of the protein when it is reduced to an alcohol. See, here." He went over to the board and pointed to one of the equations in the early part of the process.

"Potassium permanganate," yelled Parker.

Feigley threw his arms up in the air, and said, "Of course."

"Is it alkaline?" said Roth. After they had nodded at him he said, "Well, we can inject a dilute solution or we can coat a pill of it with an acid coating to get it safely through the acids in the stomach and into the alkalinity in the intestines." He sat nodding his head.

Angler leaned back and said, "Let's see if we have it all now." He began ticking things off on his fingers. "One. No urea being excreted, we have a potential victim. Two. Potential victims take injections or a coated pill of potassium permanganate. That about it?"
Feigley said, “Sure doesn’t seem like much, does it?”

“It never is,” said Angler, getting up and stretching, “It never is. I’m going back to the mountains. See you again sometime, fellows. So long, Ed.” He walked out the door.

They stood around the long mahogany table, talking excitedly. They did not at first notice it when the President walked in; he had to rap on the table with his knuckles to let them know he had arrived. They sat down.

Without preamble the President said, “Phil, I want to thank you and your people for this. It is no exaggeration to say you have probably saved the nation as we know it. You probably will never get the acknowledgment you deserve, but I intend to do everything in my power to see that you do. I must . . .”

Philip Wood interrupted him.

“Mr. President, it was not my doing that solved it. David Angler did it.”

“That the man you told me about last week? The one you had so much confidence in?”

“Yes, sir. He’s the one who broke it.”

“I want to see him. I want to start by shaking his hand.” He’s gone back to the mountains

“Well, that’ll be hard to do, sir.

and he says he’ll hide if a copter comes within a mile of his place.”

The President smiled. “I’ll see him later, then. Now, the latest statistics show that in the one week since we started, the rate of increase of pyrophilia has been stopped. The fire department out at the Institute has done a remarkable job of getting to some of the potential victims and saving them. It has also served as a distribution and instruction center, a calming influence, and general trouble shooter. The Institute people now feel that they will be able to dig out the details of the disease. I understand there have been some shakeups over there, Phil.”

Wood confirmed with a nod. “David Angler had some suggestions for some changes. We made them all.”

The Postmaster General said, “I simply cannot conceive of how one man could do in a couple of days what thousands of people could not do in years. It just doesn’t make sense.”

Wood said, “He is a very remarkable man, with a gift for just this kind of thing. He knows how to pick the right people.” He shook his head in admiration.

There was the suggestion of a twinkle in the President’s eye as he said, “So do you, Phil. So do you.”

END
AMAZING INTRODUCTORY OFFER FROM ONE OF AMERICA'S LARGEST PHOTO FINISHERS AND CAMERA MANUFACTURERS!

FREE CAMERA
WITH BUILT-IN FLASH—
PRE-FOCUSED LENS—
NECK STRAP & INSTRUCTION BOOKLET!
Plus FREE MEMBERSHIP IN THE THRIFTEE FILM CLUB!

Sensational new COMMANDER camera—a $10.95 value—yours absolutely FREE! Here is the easiest camera to use! Just aim and press the button—you can't make mistakes! Nothing to focus! Nothing to set or adjust! No double exposures! You get crisp, sharp black-and-whites, amazingly life-like color shots—even slides—with no effort at all!

YOU PAY ONLY FOR FILM AND PROCESSING! YOU GET THE CAMERA FREE—PLUS FREE MEMBERSHIP IN THE THRIFTEE FILM CLUB!

Imagine! Here's what you get...
- Commander Camera: Retail Value $10.95
- 1 Roll Kodacolor Film: Retail Value 1.25
- 1 Roll Kodak Black-and-White Film: Retail Value .55
- Pre-paid Processing Certificate: Retail Value 5.15
  (Good for 12 Jumbo Color Prints and 1 new fresh roll of Kodacolor Film)

YOU PAY ONLY $6.95...YOU SAVE $10.95!

Plus MEMBERSHIP IN THRIFTEE FILM CLUB! SAVES YOU HUNDREDS OF DOLLARS!
- FREE FILM FOR LIFE (with every roll processed!)
- FREE THRIFTEE BONUS COUPONS redeemable for FREE movie cameras, FREE enlargements, FREE projection screens—and dozens of other FREE gifts!
- DISCOUNTS UP TO 40% on all your photo needs!
- JUMBO PRINTS at NO EXTRA CHARGE!
- FREE CREDIT COUPONS for pictures that don't print!

ACT NOW—TO GET YOUR FREE CAMERA! Supply limited! Clip coupon and mail today!

THRIFTEE FILM CLUB!
Division of FORE FOTO, P.O. Box 1191, Long Island City, New York 11101

RUSH COUPON TODAY!
THRFTEE FILM CLUB, Div. of Fore Foto,
c/o GALAXY PUB. CORP.
P.O. Box 102, N.Y., N.Y. 10014
RUSH my FREE CAMERA to me at once! Also tell me how I can receive other valuable FREE GIFTS from THRIFTEE!
Also send me 1 roll of KODACOLOR Film, 1 roll of KODAK black-and-white film and 1 pre-paid processing certificate (redeemable for 12 FULL COLOR JUMBO PRINTS and 1 new fresh roll of Kodacolor film at no extra charge). Total retail value: $17.90. I pay only $6.95 plus 25¢ handling.

NAME (please print)

ADDRESS

CITY STATE ZIP

☐ Send C.O.D. I am enclosing $2.00 deposit and will pay postman $4.95, plus 25¢ handling, plus postal charges.
☐ I want to save postal charges. I am enclosing $6.95, plus 25¢ for handling.

MONEY-BACK GUARANTEE! Your money refunded in full if you are not completely pleased!
The BEMs in your neighborhood won't run off with your books if you put inside the front cover of each book...a gummed bookplate with your name printed on it!

FINAGLE SAYS—
The umpteenth corollary of Finagle's General Law of Dynamic Negatives says:

"No books are ever lost by loaning except ones you particularly want to keep."

100 for $4; 200, $6; 300, $8 with owner's name imprinted
All Postpaid. Add state sales tax, if any.

ACTUAL SIZE, all designs, 3x4 inches

The designs shown above are the only ones we offer!

Order from GALAXY 421 Hudson Street, New York 14, N.Y.