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BY
NAT SCHACHNER



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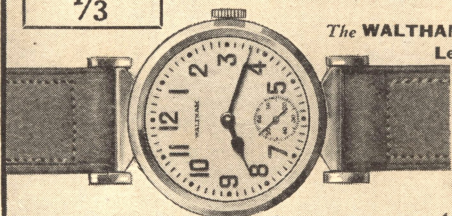
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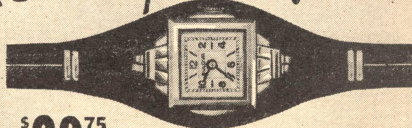


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VOLUME XVIII
Number 3

ASTOUNDING STORIES

NOVEMBER
1936

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Table of Contents

Novel:

- THE ETERNAL WANDERER . . . Nat Schachner . . . 14
Death—torture he could stand—but this strange, unknown, non-death—this dissociated being—

Novelettes:

- DYNASTY OF THE SMALL . . . John Russell Fearn . . . 59
The metamorphosis of bacteriological evolution—
- ANTON MOVES THE EARTH . . . Ross Rocklyne . . . 124
Cold black of interstellar space—misty curtains of stars—incredible distances—

Short Stories:

- THE PATH . . . Raymond Z. Gallun . . . 38
Drifting hopelessly in space—no longer part of the world—a world that needed him—
- THE LAST SELENITE . . . A. Macfadyen, Jr. . . . 48
Supreme power—supreme knowledge—unusable!
- MACKLIN'S LITTLE FRIEND . . . H. W. Guernsey . . . 83
Out of the unknown!
- THE THOUGHT WEB OF MINIPAR . . . Chan Corbett . . . 112
The secret of thought transference—release of personalities!

Serial Novel:

- THE INCREDIBLE INVASION . . . Murray Leinster . . . 94
Part Four of the gripping serial novel of the earth—and its dimensional secrets.

Science Feature:

- RED DEATH . . . John W. Campbell, Jr. . . . 43
The sixth in the series of scientific articles which embrace the entire solar system.

Readers' Department:

- EDITOR'S PAGE 123
- BRASS TACKS (The Open House of Controversy) . . . 150
Cover Painting by Howard V. Brown
Story illustrations by Dold, Flatos, Thomson, Saaty, Wesso

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Monthly publication issued by Street & Smith Publications, Inc., 79-89 Seventh Avenue, New York, N. Y. George C. Smith, Jr., President; Ormond V. Gould, Vice President and Treasurer; Artemas Holmes, Vice President and Secretary; Clarence C. Vernam, Vice President. Copyright, 1936, by Street & Smith Publications, Inc., New York. Copyright, 1936, by Street & Smith Publications, Inc., Great Britain. Entered as Second-class Matter, September 13, 1933, at the Post Office at New York, N. Y., under Act of Congress of March 3, 1879. Subscriptions to Cuba, Dom. Republic, Haiti, Spain, Central and South American Countries except The Guianas and British Honduras, \$2.25 per year. To all other Foreign Countries, including The Guianas and British Honduras, \$2.75 per year.

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must clean
acids from
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Causes Many Ills

Dr. Walter R. George, many years Health Commissioner of Indianapolis, recently stated: "Most people do not realize this, but the kidneys probably are the most remarkable organs in the entire human anatomy. Their work is just as important and just as vital to good health as the work of the heart. As Health Commissioner of the City of Indianapolis for many years and as medical director for a large insurance company, I have had opportunity to observe that a surprisingly high percentage of people are devitalized, rundown, nervous, tired, and worn-out because of poorly functioning kidneys."

If your kidneys slow down and do not function properly and fail to remove approximately 3 pints of Acids, Poisons, and liquids from your blood every 24 hours, then there is a gradual accumulation of these Acids and Wastes, and slowly, but surely your system becomes poisoned, making you feel old before your time, rundown and worn out.

Many other troublesome and painful symptoms may be caused by poorly functioning Kidneys, such as Getting Up Nights, Nervousness, Leg Pains, Dizziness, Frequent Headaches and Colds, Rheumatic Pains, Swollen Joints, Circles Under Eyes, Backaches, Loss of Vitality, Burning, Itching, Smarting, and Acidity.

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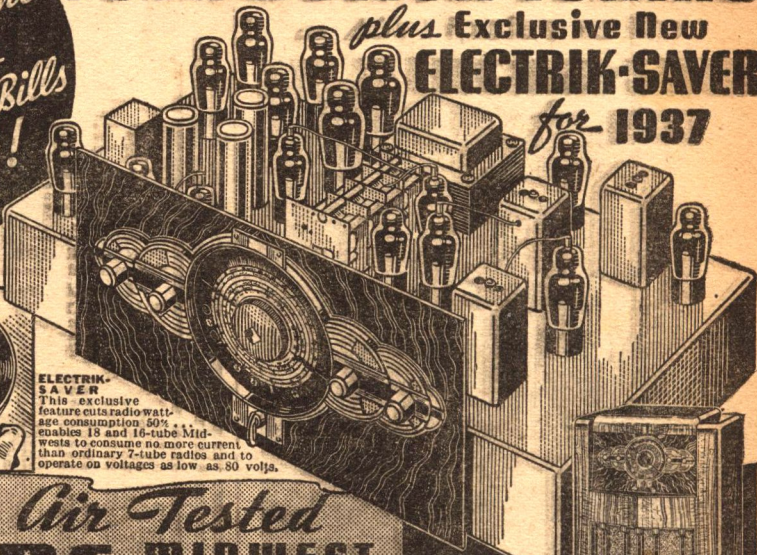
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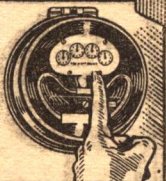
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International Typewriters
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Send no money! Not one cent in advance. No deposit of any kind. No obligation to buy. 10 day Free Trial Coupon is all you need to send. The Underwood comes to you at our risk for 10 days free trial in your own home or office. Decide for yourself after trial whether you want to buy. If you don't want to keep the Underwood or don't think it is a tremendous bargain, simply send it back at our expense. If you do want to keep it—pay only 10c a day in easy monthly payments of \$3.00 a month until low term price of \$44.90 is paid.

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Please send Underwood No. 5 (F.O.B. Chicago) at once for 10-days' trial. If I keep it I will pay \$39.90 cash or \$3.00 per month until easy term price of \$44.90 is paid. Or, if I am not perfectly satisfied I can return it express collect.

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... writes George Bailey



"I suddenly realized that I had become a fat man". The boys kidded me about my big "paunch".

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In a bathing suit... I was immense. The day I heard some children laugh at me I decided to get a Weil Belt.



What a change! I looked 3 inches slimmer at once and soon I had actually taken EIGHT INCHES off my waist... and 20 pounds off my weight!



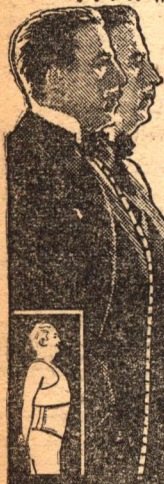
It seemed to support the abdominal walls and keep the digestive organs in place... and best of all, I became acceptable for insurance!



I have a new enjoyment of life... I work better, eat better, play better... I didn't realize how much I was missing!

IF YOU DO NOT REDUCE YOUR WAIST THREE INCHES IN TEN DAYS

... it won't cost you a penny!



We have done this for thousands of others... we know we can do as much for you... that's why we make this unconditional offer!

THE MESSAGE-LIKE ACTION DOES IT
 You will be completely comfortable and entirely unaware that its gentle pressure is working constantly while you walk, work or sit... its message-like action persistently eliminating fat with every move you make!

Many enthusiastic wearers write that the Weil Belt not only reduces fat but it also supports the abdominal walls and keeps the digestive organs in place... and with loss of fat comes increased endurance, pep and vigor!

IMPROVES YOUR APPEARANCE
 The Weil Reducing Belt will make you appear many inches slimmer at once, and in 10 short days if your waistline is not actually 3 inches smaller... 3 inches of fat gone, it won't cost you one cent!

Don't Wait, Fat is Dangerous
 Insurance companies know the danger of fat accumulations. The best medical authorities warn against obesity. Don't wait any longer, act today!

SEND FOR 10 DAY FREE TRIAL OFFER

THE WEIL COMPANY, Inc. 5110 Hill St., New Haven, Conn.

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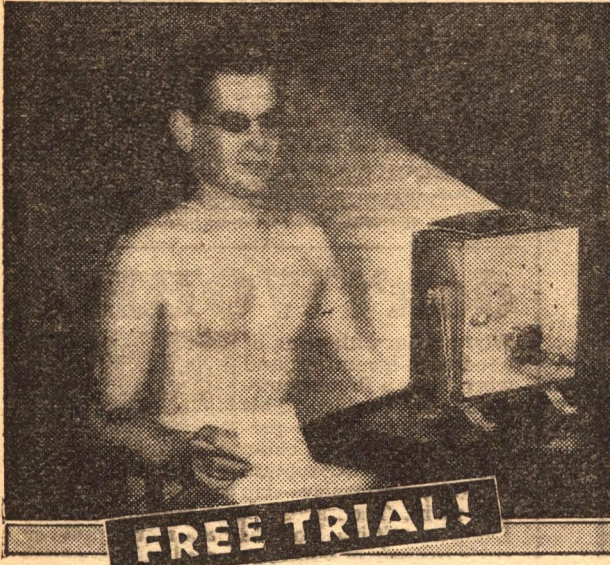
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IMPROVES YOUR APPEARANCE 100%



FREE TRIAL!

(SUN RAYS IMPROVE YOUR HEALTH AS WELL AS YOUR APPEARANCE!)

Health Authorities tell us we would be in better health if our modern living conditions did not exclude practically all sun light from our bodies. Most of our skin is covered by clothing, and when the sun light finally reaches the few exposed portions of our skin, it has lost much of its health-giving energy in the soot and dust of the atmosphere. Those of us who live in cities or work in offices all day seldom have an opportunity to expose our bodies to the direct ultra-violet rays... unless we own a Health Ray Sun Lamp. Then it is easy!

It is possible to greatly increase youthful vigor and vitality through ultra-violet rays... to prevent colds... to overcome listlessness and anemia... and especially to aid in the treatment of rickets. Build up your own resistance and that of all your family by this simple, quick method! A sun lamp used to be a luxury... now it is an inexpensive necessity!

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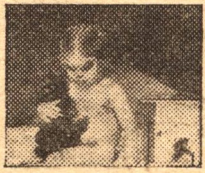


Products advertised in Child Life Magazine are all tested and approved in their laboratories. They say, "It is a pleasure to advise you that the publishers of CHILD LIFE have granted your company the 'Seal of Approval' on 'Health Ray' Lamps and Carbons. This Lamp has been in constant use by a reputable physician and is still perfect."



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An inexpensive pleasant way to safeguard health!



IF YOU WANT THE SUN LAMP AT ONCE WITHOUT WAITING FOR LITERATURE...

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Nervous Debility, Frequent Night Rising, Leg Pains, Lame Back, Lumbago, Sexual Weakness, Kidney and Bladder Trouble, Chronic Constipation, Dependancy, Restlessness at Night are only some of the ailments, differing in individuals, that can often be ascribed to lesion of the Prostate Gland.

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Massaging for the alleviation of Prostate Trouble is as old as time, and some of the most outstanding authorities in the medical profession recommend massage as a safe effective treatment. (See Reference Book of the Medical Sciences, Vol. VII, 3rd Edition.)

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The following are extracts from letters received, which are on file in our office; the complete letters and addresses will be sent to anyone who is interested in inquiring for them.

Mr. Wm. F. Lemon, San Francisco, California, writes: "After using the Prosager I am well again and feel none of the symptoms of Prostate Trouble."

Mr. Wm. F. Lee, Washington, D. C., states in his letter: "The Prosager is mild, I would not be without it." Mr. Henry Zitzman, Auburn, Indiana, says: "I will say this much for the Prosager, it has saved me from an operation. The Doctor that treated me before I got it says it is a fine thing to use. If there is any one in this territory that wants to know about it, direct them to me." Mr. Judson Trefethan, New Castle, N. H., writes about the Prosager: "I think it is a great invention, my Doctor came to see it and he said it was a good invention."



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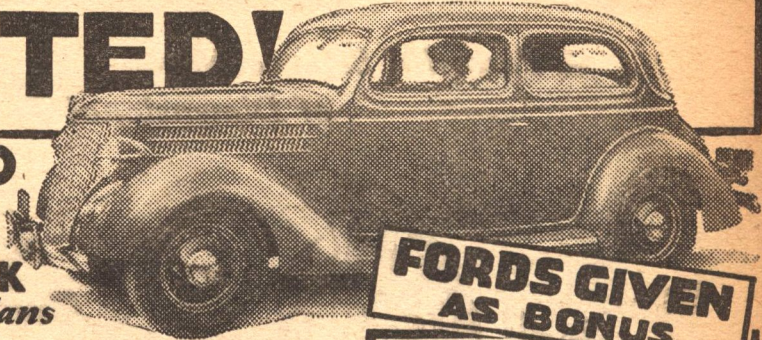
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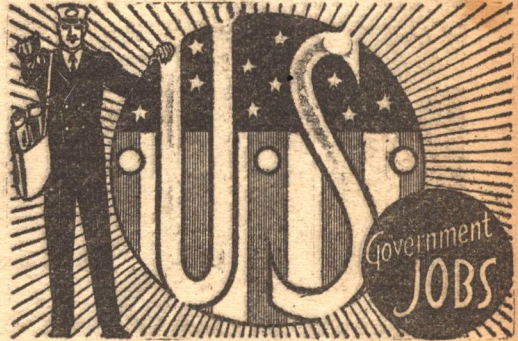
mail, and I have saved my customers thousands of dollars. Besides, I guarantee you satisfaction or they do not cost you one cent, and I take your word. Teeth made especially for you personally can be tried for sixty days. In one Pennsylvania town alone, 91 people are wearing teeth made by me, satisfied they have better teeth and saved money.

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Vesgo uttered a startled squeak, jerked vainly to one side. The glassy bodies of the Mercutians were steel-hard—

WANDERER

by Nat Schachner



Even as his fist was raised to batter at the unprotected head of the Martian leader, there was a crackle, a hiss—and then—nothingness!

THE vast interior of the Interplanetary Court was tense with excitement. Tier on tier sat the spectators, right up to the hollowed round of Deimos' curving surface. Red, burly Martians, green-scaled Venusians, and the vitreous men of Mercury leaned forward in their seats, gawping as at a play. Only the Earthmen slumped in sullen despair, knowing too well what the verdict would be.

So, too, did the prisoner. He had no illusions as to the outcome. But that did not prevent Cliff Havens from facing his judges—executioners would be the better term, he thought bitterly—with head held high and steady, fearless gaze.

They were coming in now—four of them—delegates from the four inner planets of the solar system—all-potent rulers of the known universe. Guards surrounded them—Martian giants, with flame disintegrators gripped in three-fingered paws. Other Martians, ocher-colored, stalked the aisles of the crowded audience with arrogant tread, alert for the tiniest hostile demonstration, paralyzing cones at the ready.

Especially were they clustered in the sections reserved to the Earthmen. Their brutish, unlovely countenances were aflame with provocative fires as they stepped deliberately upon the unwary toes of the seated Earth people and jabbed malicious elbows deep into their sides. But the slighter men of Earth made no counter move, and shrank fearfully into themselves at the approach of their tormentors.

One hunched and self-effacing Earthman, however, whose broad and powerful shoulders oddly belied the straggling white beard and seamy lines that aged his face, growled in his throat as a particularly vicious guard half knocked from his seat a youngster some two aisles away. His lean hand slid from its hiding place in the folds of the long brown garment he wore—the insignia of an Earth elder—and clenched into a

hard, knotty ball. Even as the unsuspecting guard, grinning with contempt for these cowardly Earth weaklings who would not be goaded into revolt, came nearer, the fist poised low, ready to lash out with hate-strong speed.

But the prisoner's eyes, flicking backward just in time, caught the gesture, and flashed instant warning. Submissively, the white-bearded elder smuggled his betraying fist back into the folds of his garment, and hunched his shoulders to a lower stoop as the Martian swaggered past.

The judges were in their seats. A hush fell over the vast assemblage. Exotic necks craned. Beulah Moorhouse, conspicuous in the front row of the Earth section, turned her agonized glance from the prisoner to the slight, overshadowed figure of the solitary Earth delegate on the judges' platform.

But the little man, frail and incongruously splendid in his golden judge's robe, opened his trembling hand in an almost imperceptible gesture of despair. His thin, ascetic face was haggard, and his eyes wavered away from those of his daughter in humiliating admission that he had failed her.

THE GIRL sank back into her seat with a stifled sob. It was all over then. Cliff Havens, the brave, the reckless, the man she loved, was doomed. Resentment against her father flared and died. After all, Warren Moorhouse had been helpless. They were three and he was one. Besides, Vesgo, the Martian chief—

Cliff Havens, the prisoner, saw that slight gesture of the Earth judge. For an instant the blood shivered in his veins; then it flowed evenly again. He had expected it. Poor Moorhouse! He must have gone through hell back there in the secret chamber of the tribunal. His eyes moved with fierce scorn over the others as they arranged their golden robes in their chairs.

Lupu, the Venusian head, had scaly hands, webbed between the fingers, and long, almost fishlike face. There were feathered gills just under his pointed ears, and his slitted nostrils breathed in the rare, cool atmosphere of the tiny, hollowed planet with manifest discomfort. Venus, his homeland, was a welter of waters with infrequent, lushly overgrown islands, pelted interminably by steamy rains. There might have been a flash of pity in his protruding eyes for the prisoned Earthman; it was hard to say.

Slem, the representative of Mercury, lolled in his seat with lazy indifference. The lining of his robe was padded with heating units, otherwise he would have frozen to death in the inimical cold of Deimos. His hard, vitreous skin, rich in silicates and almost glasslike in its transparency, was well adapted to the burning wastes of the Sun's nearest planet. No denizen of Mercury could have lived an instant in the suffocating steam of Venus without artificial protection. His broad, flat face held no human emotion; his tiny, deep-set eyes, sheathed at will by vitreous membranes to keep out the overpowering glare of the Sun, betrayed no semblance of his thoughts.

But it was Vesgo, the Martian, who dominated the council, even as he towered over them in gigantic stature. His huge, brown-red body radiated power from every pore. His great, bulbous head was arrogantly poised. His nostrils flared wide to gulp in the thin air; his faceted, saucerlike eyes, wide-angled for the feeble sunlight of his native planet, were cruel and cynically calculating.

His race were the lords of the solar system, and he was the chief of Mars. It was a huge jest to him, this pretense at a council of the planets, this make-believe at a democracy of aliens with aliens. The Martian legions policed the spaceways; their flame disintegrators were efficient deterrents to malcontents

from Mercury to the asteroids. He frowned at that.

Cliff Havens, the defiant Earthman who stood before him for judgment, had come dangerously close to success. Left to his own devices, Vesgo would have ordered him to the torture mines of Ceres, the asteroid where the flesh-rotting minerals, from which came the disintegrating principle of the Martian weapons, made gibbering madmen of the strongest prisoner in the slow progress of eternal days.

But it was better thus. Let his fellow delegates of Mercury and Venus grasp at the shadowy semblance of seeming authority. It contented them, contented the masses of their people. Behind the forms he ruled, yea, even over that poor timid old man from Earth. The Earthmen were thoroughly cowed now, their rebellion laid low in blood and flame. As for Cliff Havens, let the forms be observed—the forms prescribed by interplanetary law. It did not matter.

SLOWLY, he heaved his powerful body erect. Beulah stiffened in her chair; the Earth elder, hidden in the inner rows, muttered fiercely in his beard. His quick, strangely young eyes darted around at his compatriots, seeking for signs that they too— But their faces were expressive only of cowed resignation or hopeless despair.

"Cattle!" the elder gritted to himself. "If they only had guts——" His fingers still gripped the Dongan pellet gun beneath his robe. It was a tiny weapon and he had palmed it while the guards had searched him before admission on a forged pass to the interior of Deimos. But there was nothing now to be done—later, perhaps, when the mockeries of the formal law had been solemnly mouthed. There were three possible penalties. The first two could be managed, given daring men and certain preparations. These were already arranged. But the third penalty! He

shivered at the thought of it. It had never been invoked before. It was too barbarous, too horribly fiendish. They couldn't—

Vesgo stared with his wide, calculating eyes at the prisoner. Cliff paled slightly, and tensed himself for the verdict. It was coming now.

"Clifford Havens," Vesgo squeaked—there was something sinister in the bat-like gibbering of the red giants of Mars, "the judges of the Interplanetary Court have considered your case with extreme care. The evidence is clear. By your own confession, by the testimony of innumerable witnesses, you have been proven guilty of most heinous crimes.

"You and your misguided dupes on the planet Earth, member of our august confederation, have dared to rise in revolt against the Interplanetary Council. You slew many of our brave and faithful police; you captured and destroyed two of the council's space cruisers; you dared in your wicked schemes to murder Xlar, the confidential secretary of our own delegate, my esteemed colleague, Warren Moorhouse." He turned and bowed ironically to the little man, who blinked and seemed to shrink even deeper into his golden robe.

"For that there can be but one decision: death! The judges were unanimous on that."

Cliff heard it without a qualm. But a low, tortured cry rose from Beulah. Her scorching eyes went to her father's suddenly white face. *Unanimous!* Good Lord, her father had assented, had not made the fight he had promised!

Warren Moorhouse shivered in his robes. He cursed the day he had ever accepted election to this hollow mockery. How could he explain what had happened? That Vesgo, in quick asides, had threatened destruction to Earth and all its teeming millions if the decision were not unanimous? That only so could the erring planet dissociate itself from the criminal revolt of the young

man who now stood fearlessly before them.

The Earth elder in the spectators' rows leaned forward breathlessly. Of course the penalty would have been death. He had expected that. But the mode! All his being clamored, waiting— The vast audience stirred uneasily. The silence was electric.

II.

A VOICE blazed out suddenly, ringing with scorn. The prisoner was speaking. "Of course," Cliff said proudly, "I had expected nothing else from the court. You are going to murder me with due legal process. Why? Because I and thousands of my Earth fellows could bear no longer to see our beloved planet ground down by an alien, unspeakable tyranny. I say so now and I shall continue to say so as long as the power of speech is in me.

"Once, not many years ago, the Interplanetary Confederation was in truth a league of equals, a conference of free planets on a democratic basis. But that was before Mars discovered the secret of flame disintegration."

He faced the glowering Martian judge boldly. "You, Vesgo, conceived the treacherous plot. Step by step you worked, with the cunning of a snake and the treachery of a jackal. Quietly you gained control of the Interplanetary Police, of the cruisers of the spaceways. Your henchmen, armed with the disintegrators, swarm the planets. Your spies were smuggled into the local planetary councils as secretaries, to report to you each move, each word that is being uttered. Of course I killed Xlar. It was he who warned you of our plans, who enabled you to bathe Earth with the blood of its bravest sons."

He swung passionately to Lupu, the Venusian, to Slem, the Mercurian, from them to the astounded round of spectators. "You are all slaves," he shouted,

"slaves in fact of the Martian tyrants. Be not deluded by the hollow shams of the council. Even that shall soon be stripped from you. Vesgo is preparing. Rise now, sweep the Martian power from your planets, regain your ancient heritage before it is too late. We of Earth tried, and failed through treachery. Join us——"

Vesgo's brick-red countenance was a hideous scarlet. His fuddled senses clicked to a cold, consuming fury. Already the men of alien planets were on their feet, clamoring, hurling indistinguishable epithets at each other. A certain elder of Earth had half withdrawn his Dongan pellet gun, joyously, ready to lead the planetary men against the Martian guards, with bare hands if necessary. "Good old Cliff!" he whooped.

In seconds the interior of Deimos would be a seething, uncontrolled madness. Vesgo's squeak, curiously penetrating, ripped through the tumult.

"Seize the prisoner," he shouted. "Stop his blasphemous mouth. Slay the first spectator who makes a move."

The great round seemed suddenly to swarm with Martian guards. They hurled themselves upon Cliff, clapped wool-covered hands over his mouth, twisted his arms behind his back until the bones seemed ready to snap. Hundreds of others breasted the sections of Earthmen, Venusians and Mercurians, flame distintegrators swinging in ominous unison. Little flicks of the middle fingers, and blasting destruction would sear through the huddled mobs in an orgy of slaughter.

IN SECONDS it was all over. The frightened men of the planets shrank hurriedly into their seats, aghast at their own temerity. The bearded Earthman mouthed dreadful curses to himself, and once more was a stooped, inconspicuous old man.

Beulah, who had started to her feet in

a wild access of hope, sank down again in numbing despair. Only the Martian section clamored raucous approval and hurled biting taunts at the cowed denizens of the other planets.

For a moment Vesgo permitted his huge, faceted eyes to wander over the vast concourse, to fix finally on the still struggling prisoner. His thoughts were busy behind the smooth façade of his inscrutable countenance. This obstreperous prisoner from Earth had fathomed his plans only too well, had revealed them to the men of the planets. No matter what disclaimers he made, no matter what protestations of belief they yielded to his face, already the seeds of suspicion were at work.

As for Warren Moorhouse, he dismissed him contemptuously. A poor, feeble old man, long past the prime of vigorous action. But Lupu, the delegate from Venus, was intelligent. So far he had followed his, Vesgo's lead. But those slitted fish eyes had rested on him at certain times in council meetings with disconcerting meaning, as if veiled thoughts played behind the blandness of his gaze. And even Slem, the stupid Mercurian, back on his own burning planet, might, in the long, blazing days, have time to ponder on the meaning of these things he had just heard.

Vesgo was able to follow a tortuous, involved policy for many Martian years, if necessary, to gain his secret ends. But he was also capable of quick, unalterable decisions. He made one now.

He faced the once more silent assemblage with exasperating calm. His high-pitched voice was openly contemptuous. "I see," he said, "that there has been a conspiracy afoot. The contagion of rebellion was not confined solely to the planet Earth. By their actions only now the denizens of the other planets have betrayed their complicity. Mars, our beloved homeland, was the focus and aim of all your damnable plotting." His

voice hardened. "Very well then. We are prepared; we shall act at once."

He stepped back, pressed a tiny button on the arm of his ornate chair. Soft blue flames flickered over the circular ornament that had seemed merely a design for the headpiece. It was a microphone, attuned to a tight band secret wave length. Vesgo had prepared well for all emergencies. He spoke rapidly into the instrument.

"Vesgo, chief of Mars, calling all special Martian units. Proceed at once to execute Plan B of your instructions. The captain who fails in his appointed task goes, a slave, to the mines of Ceres. That is all."

Lupu, the Venusian delegate, was on his webbed feet at once. The green of his face was a sickly pallor; his gills feathered outward in the unfamiliar medium with unwonted excitement.

"What is the meaning of this mummery?" he demanded in thin, flutelike tones.

The corners of the Martian's wide gape of a mouth twisted as he looked down on the slender alien. He could crush him with one sweep of his huge arms.

"It means, oh, Lupu," he mocked, "that the mummery is ended. Even now the space cruisers of the Interplanetary Police are speeding to all your planets. They are Martian, manned and captained by Martians. Within hours their flame disintegrators will be trained on the principal cities of your rebellious planets. My secret agents—your private secretary for one—oh, Lupu; others, carefully planted at strategic points, are ready to cooperate. Within an hour of Martian time it will all be over. The sham of the Interplanetary Council is done." He spat black juice on the immaculate, polished, lavalike floor. "You are slaves, all of you. Mars, the great and glorious, is your master, and I, Vesgo, am the chief of Mars."

CLIFF, held by strong, brutal hands, writhed in helpless rage. He had known this was coming, had tried to organize the planets against the day. He had failed; more, the fools of Mercury and Venus had joined the tyrant to crush Earth's futile gesture of revolt. It was done, finished. He was sentenced to death. That did not matter; though an anguished qualm shivered through him at the thought of Beulah. He saw her now as he twisted in vain attempt to break free—her lovely, pallid face, the hopeless agony of her once sparkling eyes as they fixed burningly on his—as if to fix his visage in her memory for ages to come.

For a split second the huge interior of Deimos was a stunned, frozen silence. Then a low growl came from a certain ancient Earthman. It was taken up, spread, and died immediately. For Martian guards thrust forward flame disintegrators, eager for the word. The Martian sections clamored and shouted their glee until the echoes rebounded from the shell of the sixty-mile round.

Warren Moorhouse slumped in his seat, groaning. He was a weary old man, weighted down with the realization of his own futility. Slem, the Mercurian, stared stupidly. His sluggish mental processes had not grasped the situation entire. But Lupu had. His webbed, green-veined hand moved like lightning to the button on his chair. The transmitter glowed into being.

"Hordes of Venus," he fluted desperately, "this is Lupu on Deimos. Take warning——"

He got no further. A Martian whipped up his paralyzing cone, tripped the lever. Lupu stopped in mid-word, thin-slashed mouth agape, unable to close. He was a green statue in a golden robe, rigid, turned to marble.

"You were lucky, Lupu," Vesgo said, "that it was not a disintegrator. Next time——"

It had taken a long while for the sig-

nificance of the scene to penetrate the brain of the vitreous being from Mercury. But something snapped now. His tiny, deep-set eyes glittered like hard diamonds, his limbs of silicated flesh retracted like a clasp knife, jerked open like jagged lightning. Straight for the unguarded chief of Mars he catapulted, with a roar of crashing thunderbolts.

Vesgo uttered a startled squeak, jerked vainly to one side. The glassy bodies of the Mercutians were steel-hard battering-rams, against which the spongy, water-secreting flesh of the Martian would pulp in a hideous spatter.

A flame seared out from a Martian gun. It leaped across the intervening space, contacted the plunging Mercutian. It caught him square in the middle. Even as his fist was raised to batter at the unprotected head of the Martian leader, there was a crackle, a hiss, and—there was nothingness. Molecules, atoms, electrons, protons—of flesh, of bone, of tissue—had disintegrated into primal, inchoate, invisible stuff.

Before the horrified gaze of the on-lookers, a torso with uplifted hand, cleanly dissociated, wobbled in mid-air, and fell with a splintering crash to the smooth, stony floor. Two legs, unconnected, solitary, jerked forward with acquired momentum, to slide to a grisly, toppling fall ten rods farther.

Vesgo righted himself, his flaring nostrils gulping with the fear of remembered death. His saucer eyes glittered furiously. "Take the carrion remains," he ordered, "and throw them into empty space, as a warning to all future proposers of traitorous murder. As for you, Clifford Havens"—he turned to the young Earth prisoner—"you shall be another warning. Weakly, I had permitted that fool Moorhouse to persuade me to the simple, easy penalty of flame disintegration. But now I impose another—the penalty of the Eternal Wanderer."

A LOW MUTTER of horror rose from the blanched lips of the Earth spectators.

Beulah rose from her seat with arms outstretched in frantic appeal. "Please, Vesgo, not that! Any punishment but that."

"Silence!" the Martian raged.

A guard rushed up, thrust her back in her chair with brutal force.

In the rear the Earth elder groaned in utter despair. *The Eternal Wanderer!* The extreme penalty, to which death itself was easy. His plans, his arrangements were worthless. All hope of rescue was gone. Had it not been for the slumped figure of Beulah Moorhouse, he would have whipped out his Dongan gun, burned the sneering Martian leader down with the inextinguishable fires of its tiny pellets, and died in a final suicidal fight against the massed weapons of the guards. But that would have meant hideous, indiscriminate slaughter, the lives of thousands of hapless Earthfolk, an unknown fate for Beulah. So he subsided, gritting his teeth.

Cliff was the calmest of them all. He had steeled himself against all fates, against the torture mines of Ceres, even against this. Death would come sooner or later. It must. Then the insanely weary interval would be as if it had never been.

The guards hustled him out, past the huddled, fainted girl. His eyes went to her desperately. How beautiful she was, even with the pallor on her face! Never, never again would he see her. Then he saw the aged man in the long brown robe. Their eyes met, flicked hastily away for fear of betrayal. For an instant Cliff's frozen heart warmed within him. Good old Kerry! Loyal to the very end! He smiled bitterly. What ingenuity Kerry Dale must have used to worm his way into the very center of the enemy's camp, where recognition meant instant death! What plans must have brewed in that nimbly fertile brain,

now brought to naught by the penalty imposed.

The secret of the Eternal Wanderer was a close-held secret of Mars. They boasted and bragged about it. From it there was no escape, no hope for the fated sufferer. And now it was to be used upon himself.

He was thrust violently into a lift; the door slammed to shut out the craning thousands. They were rising swiftly to the surface shell. Deimos, tiny satellite of Mars, not over twenty miles in diameter, had been hollowed out by the engineers of Mars, converted into the permanent seat of the Interplanetary Council. Thus, ingeniously, the council was brought within the power of the Martians' guns. The huge, tunneled flame disintegrators of the other planet, belching their mile-deep shafts with formidable menace out at all hostile attempts from space, mocked at the 14,600-mile distance to its infinitesimal moon. One blast from the Martian surface and satellite and council and all would disappear from the face of the heavens.

The lift came to a silent stop. The door opened smoothly. The huge Martians shoved him staggering out.

Cliff found himself in a cylindrical cell, black-walled, a unit with the sterile crust of Deimos. Overhead, a view-port, cased with yard-thick quartz, gave on outer space. A disk of flaring red showed to one side: Mars, the warrior planet. A faint blotch of deeper red showed near the edge, from which dark lines radiated like the spokes of a wheel. Cliff knew it to be Antor, the capital city of the race, with its strange, soaring structures up to the very limits of the thin, cold atmosphere, and its canals through which the snows of the polar regions sluiced in melted flood through the brief summer seasons. Outside of that there was only the deep, jet black of eternal space.

He grimaced bitterly. There dwelt

the arrogant masters of the solar system, and he, the man of Earth who had defied them, was doomed to an unbelievable end.

Swiftly, he inspected the cold, smooth round of his prison. The walls were a piece with Deimos. The lift was gone, and not the tiniest crack showed where the door had been. The quartz above was thick and tough. Besides, there were Martian cruisers anchored to the outer surface, and guards in space suits and weighted leaden shoes who patrolled the bleak, airless round. There was no chance of escape. So, with infinite calm, he composed himself on the basalt floor, and promptly fell asleep.

III.

HE AWOKE to the rough shaking of his shoulder and the squeaking of a Martian voice in his ear. "Get up, Earth dog. You have slept enough; soon you will beg for sleep, for death itself." The guard guffawed at his own humor.

Cliff rose alertly to his feet. The chamber was crowded with Martian giants, each with the paralyzing cone at the ready. They were taking no chances. He glanced upward for a last look at the alien planet. There was no sign of it. Instead, a space unit was clamped in place over the quartz, and a ladder he had not seen before reared itself upward. The quartz disk was wide on its hinges.

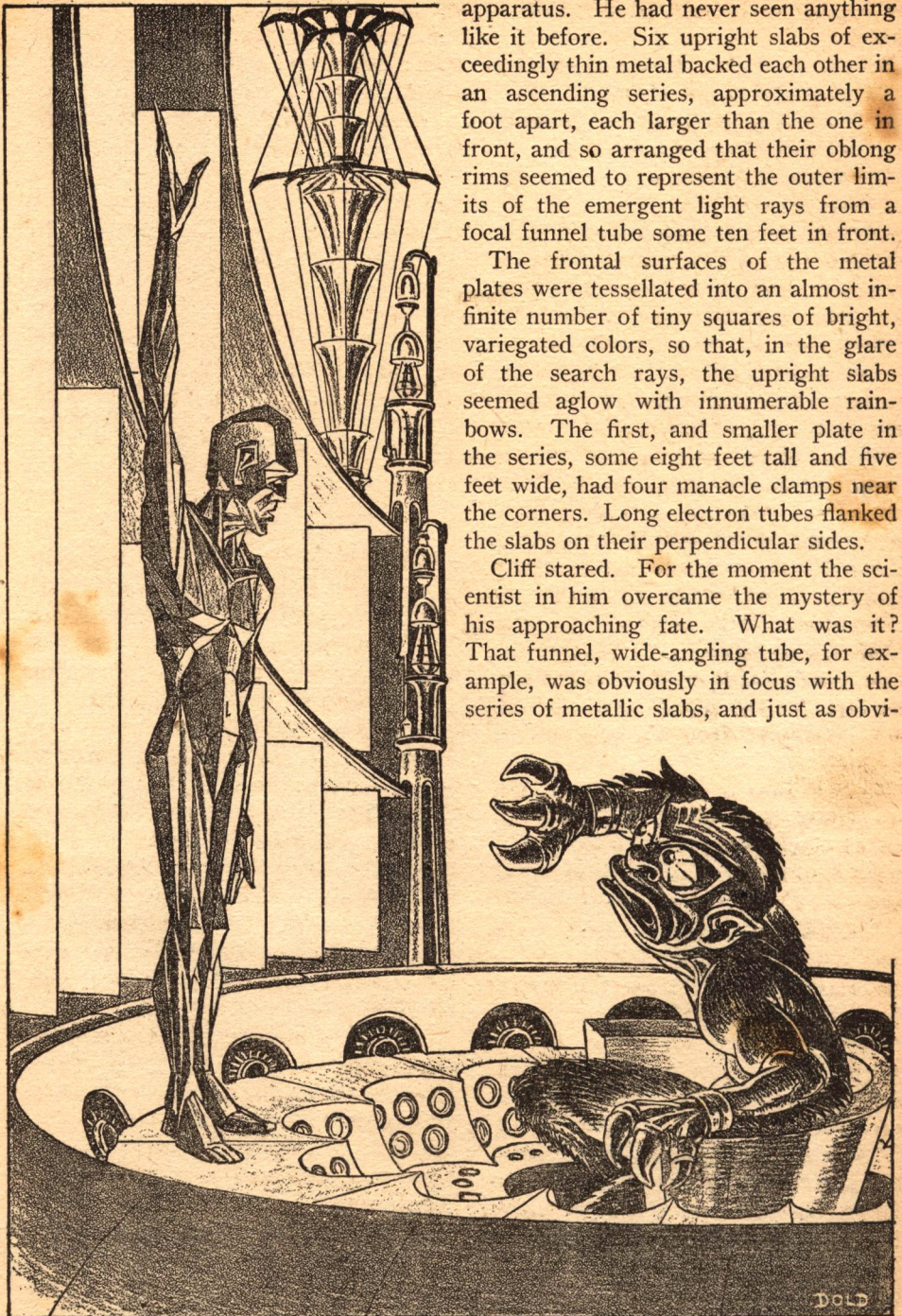
Without a murmur, he clambered up the ladder, into the space unit. For a moment he stood blinking in the dazzling light of the search beams that were trained on the air-filled quartz chamber from long, grim cruisers swinging outward from anchor on the desolate, weakly gravitated surface. Within the planet, artificial gravitation as well as artificial light, heat and air were used.

Then, as his vision cleared, he saw, at the farther corner, a weird complex of

apparatus. He had never seen anything like it before. Six upright slabs of exceedingly thin metal backed each other in an ascending series, approximately a foot apart, and so arranged that their oblong rims seemed to represent the outer limits of the emergent light rays from a focal funnel tube some ten feet in front.

The frontal surfaces of the metal plates were tessellated into an almost infinite number of tiny squares of bright, variegated colors, so that, in the glare of the search rays, the upright slabs seemed aglow with innumerable rainbows. The first, and smaller plate in the series, some eight feet tall and five feet wide, had four manacle clamps near the corners. Long electron tubes flanked the slabs on their perpendicular sides.

Cliff stared. For the moment the scientist in him overcame the mystery of his approaching fate. What was it? That funnel, wide-angling tube, for example, was obviously in focus with the series of metallic slabs, and just as obvi-



DOLD

It was impossible, incredible! The apparition had seemingly glided through the containing walls—

ously, from its hook-up with an intricate arrangement of quartzite bulbs, was destined to pour a stream of emanations upon the serried plates. But whether they were X rays, gamma rays, neutron bullets or cosmic rays, there was no means of telling.

His puzzled glance moved past the funnel, and paused understandingly on the great machine of cogs and rollers and levers and tracing styluses flush against the quartz wall of the space unit. He had seen such brain machines before, though on a much simpler scale. Through the aid of their remarkable wizardry the most complex, the most abstruse mathematical problems could be solved in the course of minutes—problems that otherwise might have taken weary months of calculations, problems even that were unsolvable by the human brain.

It was the brain machine that had made possible the reduction of the universe to a single equation, that had rendered interplanetary flight a matter of piercing the space-warp continuum, instead of the infinitely slow communication along the normal gravitational world lines; and it had created a mathematics of its own that even Warren Moorhouse himself, the greatest mathematician of the system, could not follow.

THE BRAIN MACHINE, nevertheless, was a familiar sight. Not so the sloping apparatus to which it was attached. This was a banked series of keys, arranged in parallel longitudinal and lateral rows, for all the world like an ancient linotyping machine, in the days when books and papers were still being printed from metal type. But the keys were carved into curious shapes—each the tiny simulacrum of a man, all essentially alike, yet differing from each other by the faintest of hairbreadth variations.

For one sweeping second Cliff Ha-

vens' eyes held on the conglomerate of intricate apparatus; for a longer instant they clashed defiantly with the mocking gaze of Vesgo, the Martian; for a casual flicker they rested on the sear-brown figure of a strange Martian whose high bald pate accentuated the bulge of his bulbous head and whose attention was all directed to tightening the knobs of the queer, banked keys.

Then his troubled stare went on, out toward the cruisers, out toward the black of outer space. Where was the Eternal Wanderer; where was the dread space vessel that no one had ever seen, yet all the solar system had trembled at? For the very name had conjured up a vision of some strange, hermetic craft, in which the doomed victim, tight-sealed, was flung into the unknown reaches of space, to wander in eternal agony without hope of surcease or of rescue. Yet inside the space unit was only a series of machines which held no meaning, and outside, angling off from the curved surface of Deimos, were only the too-familiar cruisers of the Martians.

The bald Martian straightened, said: "All is in readiness, magnificent."

Vesgo grinned at Cliff—and in all the system there is nothing more malign than a Martian grin. "You need not seek vainly for the Eternal Wanderer, Earth dog," he squeaked. "It stands before you, quiescent, yet quivering, awaiting its prey." His three-fingered hand rested heavily on the manikin type.

Cliff started. The guards gripped him tight, fearing a sudden break. "That the Eternal Wanderer?" he echoed scornfully. "Is that your vaunted instrument of torture with which you frightened the planets? It is but a feeble jest, Vesgo, and I do not easily scare."

The Martian chuckled hoarsely. "The jest is better than you think, Earth rebel," he said. "It was I who spread

the rumor of a space vessel, to hide its real identity from spying eyes. You are not afraid? Wait until Harg explains." He bowed ironically toward the bald Martian. "He is the inventor. Tell him, Harg."

Harg was sear with age and wrinkled like an overripe pomegranate. His faceted eyes stared straight at the astounded Earthman and did not seem to see him. His shrunken paw caressed the parallel columns with stroking fingers. Scientists were the same throughout the solar system.

"I am sorry, Clifford Havens, inhabitant of the planet Earth," he said slowly, "that my invention has been turned from its original purpose to a fiendish instrument. But Vesgo, magnificent of Mars, has ordered it so, and I am the humblest of his subjects."

"Take care, Harg," Vesgo growled threateningly. "You presume on my patience."

The inventor bowed, humbly, yet with the faintest shadow of irony. "I do indeed, oh, magnificent. I shall refrain." He turned to Cliff. "What you see," he explained, pointing to the sloping bank of keys, "is but the mechanical counterpart of what has hitherto been the most abstract of mathematical forms of analysis—the matrix.

"By means of matrix mathematics any given problem is dissociated into an infinite series of quantities arranged in systematic array, and can thus be studied and relationships discovered which would otherwise have remained forever indecipherable. I have not only made a machine to dissociate the—ah—problem into a matrix pattern, but I have been able to limit the matrix series to a finite number of dissociants."

CLIFF knew that somehow, behind the slow, squeaky voice of the Martian scientist, death awaited him. Vesgo had refused him the torture mines of Ceres.

That meant but one thing—that the death of the Eternal Wanderer was far worse. But what had this dry, mathematical discussion, this theory of matrices, to do with it?

He faced the pair steadily. "It is all very pretty," he said coldly, "but I am no mathematician. Warren Moorhouse perhaps might understand, and be interested. I am, according to Vesgo, a rebel, and under a strange, unknowable sentence. Why waste my time—and his—with these abstractions?"

"Because," Harg sibilated, and this time Cliff was sure there was pity in the alien Martian, "*you* are the problem."

Still Cliff did not understand; yet somehow, for the first time since he had been captured, dread pulsed through his veins. Death by normal means, no matter how lingering, no matter how agonizing, would be accepted without cringing, without repining for his ill-fated rebellion—but this bloodless, mathematical enigma— He laughed harshly to whistle up his courage. "If you mean that I am to be disintegrated," he stated defiantly, "I am not afraid. A quick, painless death—what more could I ask for?"

"I said *dissociated*, not disintegrated," corrected Harg. "The latter is death; the former is not. Rather, I would consider it an immortality of sorts. I don't know; none of the animals with which I have experimented have come back, could possibly come back."

A strange blur passed over Cliff's vision. He still did not understand, but something in Harg's manner, something in that last queer phrase—

In a daze, he heard Harg's squeaky voice go on and on. "The matrix is the key to the universe, to everything in it. This matrix of mine is built specifically for life forms, shaped generically for the various men of the solar system. The particular series I have just installed applies to men of the planet Earth.

"That funnel arrangement emits a new type ray I have recently discovered, the most penetrating in the universe. It pierces flesh and metal with equal facility, loosens the bonds that hold molecules together, atoms in their valences, electrons in their orbits. All attractions and repulsions disappear. The space-time continuum itself has no further influence. It is then that the matrix pattern applies. This world ray of mine is first transfused through the matrix and the brain machine to take on the required pattern; then it is focused on you, the problem to be solved." He indicated with shrunken hand the manacles on the frontal metal plate.

"Your corresponding matrix is patterned through the tessellated squares," he continued inexorably, "into the second plate; through its squares to the third, and so on until you are emitted from the sixth and final plate. These squares are so arranged that an infinite series of permutations and combinations are the end result, to make up a true or definitive matrix. That is all."

THERE WAS a strained silence as he ceased. The guards goggled foolishly, understanding nothing, yet convinced that their prisoner was doomed to a fate beyond the mere physical tortures of the mines of Ceres. But Vesgo knew, and knowing, grinned with avid anticipation.

Cliff straightened his shoulders. "You call it a matrix dissociation," he remarked evenly. "I call it disintegration. Whatever the means, the end result is the same. I vanish into a maze of constituent electrons, protons—matrices, if you will. What does it matter? I am dead, extinct, painlessly. Get it over with."

"No," whispered Harg. "You are not dead—at least I do not think so. None of the test animals have ever returned to report. But, if my theory is correct,

you are still alive, will remain alive for all eternity. That's what makes it so horrible. I had not intended my machine for use on man. I——"

"Harg!" Vesgo broke in sharply.

"Yes, magnificent." The Martian scientist bowed humbly. Slowly he turned to Cliff. "You see, you will be a million million dissociants, each one of them somehow yourself, yet only the totality making up the real *you*. In each of you will be consciousness, and an awareness of incompleteness. Yet the sum of you will be scattered through all of space and all of time; for the matrix formula that controls the universe will control you also. You may remember it. Long ago Heisenberg, Dirac and Schrödinger developed it: $qp-pq-i\hbar/2$ ||

"Simple, but world-shaking," he continued, faceted eyes fixed on far-off places. "For 'q' represents the matrix coordinates of your being as well as those of the universe; 'p' is the momentum, and 'h' the quantum of action. But 'qp' does not equal 'pq,' and never can." The Martian actually shivered. "Where you will be, how long your scattered dissociants will pulse for each other, what your relation to the universe entire, I do not know, perhaps can never know. *That* is why I call it the fate of the Eternal Wanderer."

He stopped, but to Cliff the mute chamber was a roaring echo of sound. Death he could stand; torture he could face, and smile at his tormentors; but this strange, mystical non-death, this dissociated being, sent the blood pounding in his veins with sledge-hammer blows. The white face of Beulah swam before him, anguished, hopeless; the angry eyes and brick-red thatch of Kerry Dale, unaccountably masked by banda juice well rubbed in and the long brown garment of an elder. They had done their best to save him. It was not their fault. Now it was too late.

Through the roaring and the haze he

heard Vesgo's impatient squeak. "Enough of idle talk. Place the rebel in the clamps, guards, and you, Harg, waste no further time."

Cliff struggled, but the powerful Martians dragged him to the upright metal slab, jerked arms and legs into the tight, clicking embrace of the prisoning circlets. Like a gigantic X he stood, flat against the rainbow-tinted plate, facing the curious funnel with wide, steady eyes. Now that the doom was upon him, he was calm, unafraid. He must not permit Vesgo the satisfaction of seeing him cringe.

HARG avoided his eyes. He tripped a switch. The flanking electronic columns lighted up with blue flame. He pulled a lever. The brain machine whirred and slid and turned, cog within interminable cog. Styluses traced complicated curves; hidden parts clicked and pounded. The matrix keys bobbed up and down as though pressed by invisible fingers. Harg's skinny hand was shaking as it crept reluctantly toward the final lever.

Cliff took a deep breath, faced his fate with head erect. "You need not worry, Harg," he said. "Whatever happens, I am not afraid. As for you, Vesgo," his voice rose contemptuously, "my removal will not end revolt. There are millions of others waiting to——"

The lever jerked downward. At once the chamber was filled with leaping blue flames. Tubes whined and sizzled; giant disks whirled in a blur of motion. The great pointing funnel jerked under invisible impacts. Yet nothing happened. For a moment a wild hope pulsed through Cliff that the dread machine would not function, that perhaps it was all a ghastly jest.

Then, suddenly, a deep-violet light leaped from the orifice, bathed him in its glare. Instantly he felt himself shattered into a million, million tiny bits. He opened his mouth to cry out with the su-

pernal torture of that horrible sensation, but he had no mouth. He flung against his manacles, but they were no longer there. Harg's pitying gaze, Vesgo's face aflame with satisfied cruelty, instruments, the chamber itself, hazed, faded, were lost in an infinity of space and time. Only the infolding, rending flame remained, only the succession of tessellated plates.

His body had melted, was driven through the first of the slabs as if it were thin air. For an infinitesimal moment he flattened against the second. Another violent, supernal shattering. The million, million shards dissociated once more, forced their way through tinier, and more numerous squares, repeated the process at the third, the fourth, the fifth.

At the sixth and largest, there was a blinding flash, a grind as of the indivisible shattering into the ultimate, and blaze and metal slabs alike vanished in a whelming concussion——

CLIFF HAVENS was conscious. He knew that, for he thought; he saw with the invisible eye of his mind; he felt. But what he was, or where he was, was something else again. He tried by a supreme effort of will to concentrate himself. He could not. For, wherever he exercised the act of volition, he sensed at once that he was in a million, million other places.

It was a dreadful sensation, such as had been vouchsafed to no mortal man since the beginning of time. He was a matrix, a dissociation into an infinitude of symbols, each somehow himself, yet each curiously incomplete, demanding union with the totality with a yearning beyond all mortal anguish. The universe of things held him entire; yet he was nowhere.

He tried to orient himself. A coordinate envisaged the solar system, saw Vesgo within a Martian cruiser, driving through the spaceways. Venus was a

flame of radiolite bombs; the tossing oceans boiled with vast explosions. Mercury lay supine and baking under the menacing flash of the Martian warships. Earth was a sullen, muttering huddle, policed by huge battalions. Beulah, Kerry Dale and Moorhouse were vanished.

Then, in spite of himself, Cliff was no longer there. He was a different quantity in the depths of space. A great red sun enveloped him at its core; atoms exploded in the fierce furnace fires; electrons vanished in a wave of radiation; matter was being annihilated.

In a breath-taking flash Sun and electrons were gone. A planet swam within his grasp, mighty, magnificent, circling two golden stars. A vast civilization reared on its glassy surface, beings that were whorls of pure essence floating in eternal music. Like a clicking camera the scene shifted. He was still there, observing that glorious race, yet he was far away, so far a million light years intervened.

A nebula—a filmy cloud of primal stuff in which a swarm of stars glittered like glowworms in a moonlighted haze, rushed past him with a speed approaching light. He was on the outermost boundaries of the universe, the very rim of exploding space.

Then that, too, was a dim, remote awareness. He was out of space, out of time, where nothing had yet been born, where nothing yet existed. He was surrounded by nothingness. Somewhere, unimaginable eons away, a universe was expanding, gobbling up the formlessness into the pattern of its warp; but here it was not yet. Perhaps it would never be. Yet was it empty; was it void of all things?

If only Cliff could have coalesced, brought all his infinite matrix elements together, perhaps he might have known; perhaps he might have understood. For something brooded over the emptiness, something beyond all cosmic imaginings.

The Cliff that was there shrank shriveling into himself. That formlessness was more awful, more supernal, than all the other Cliffs throughout the fashioned universe could envisage. Perhaps, he willed desperately, here were the ultimate secrets, the life stuff that awaited the advent of expanding space and time to impregnate with its quickening influence.

He was tossing suddenly in the probability storms of an electron train of waves; again, he saw a nova hurtle flaming gases into space; he rode a light wave that had started out from Andromeda a million years before, and was tired of its endless journeying; he was present when the universe was born; he floated supinely on the waveless heat death of the final trump. He partook in chemical reactions and witnessed the collision of two rushing stars; he was here, there, everywhere—all space was intertwined with his matrix—so was time. Strange races came from the slime, flowered, died.

Yet always he saw and saw not; was aware and knew that he was not fully aware. Always his infinite series, the components that were his matrix, yearned for totality, for the wholeness that once had been Clifford Havens, a mortal man in a pin point of time and space.

It was a yearning of unimaginable intensity; a torture more dreadful than any possible contriving. A million, million Cliffs cried out the unutterable pain of separation, of endless incompleteness, wailed for that totality which must forever be denied them. He was a problem to which the key had been withdrawn, a problem that could never be solved. An endless, hopeless eternity awaited him—

IV.

THE VAST INTERIOR of the Interplanetary Court was dark. The curving tiers were tenantless; the carved

seats of the judges were vacant. Nothing stirred; nothing moved. In all of Deimos' hollowed round there seemed no life, no motion. Only on the surface, swinging idly to the magnetic clamp of the landing porte, was a solitary Martian cruiser, sole sentinel for the silent court.

It was a routine guard. What could possibly happen to Deimos? Who in all the solar system dared attack its sanctity? Mars was the ruling planet—absolute, overpowering. Vesgo had planned his *coup* well. On Venus there had been a flurry of revolt. Lupu's warning message had raised the fishmen from their surging oceans. But Vesgo had come hard on its heels, captaining a mighty armament of the cruisers of the spaceways. Flame disintegrators had sprayed the Venusians hordes, radiolite detonators had shattered them in their hiding places in the caves beneath the seas; paralyzing cones had held them rigid.

The Mercutians, leaderless on the death of Slem, retreated sullenly to their burrows. On Earth, the flower of mankind had died in Cliff's desperate rebellion, and the Martian giants were everywhere, itching for the chance to harry and burn and slay. And Warren Moorhouse was still missing, with his daughter, and Kerry Dale, on whose head Vesgo had set a price.

Even the cruiser was dark and asleep. It was the night watch. A single burly Martian yawned in the forward chamber, flame disintegrator dangling from his belt. He was sleepy, and there was really nothing to watch. Through the crystallite panel he could see the dark, desolate, moveless surface of Deimos. The space unit in which the matrix complex was housed was a smooth, quartzite round from which there was no exit into outer space.

The sentinel let his weary eyes roam over its darkling depths, turned them upward to the flaring red disk of Mars, his

hometown. He had been away from his home on the main canal for almost a year, on space duty. There was a wife, three small children— Grumbling under his breath, he sat down. It was very still and home was remote. His head nodded; he was asleep.

A tiny pencil of flame pierced the interior of the Interplanetary Court, swung probing over the curving wall. "Careful, Kerry," a girl's voice floated through the darkness. "Maybe there are guards inside."

"I made sure of that," the wielder of the torch retorted. "Vesgo never would expect to find us here. He's turning Earth upside down looking for us. That's a swell gadget you attached to Beulah's space yacht, Mr. Moorhouse. We'd never have been able to slip through the Martian patrols otherwise."

"The invisibility magnet?" came a third voice out of the dark. "It's simple enough in operation. I've been working on it for years. It simply bends the light waves around the ship, so that, from the outside, there is nothing to be seen."

"We couldn't see, either," grumbled Kerry. "It's a damn tough job flying by blind reckoning."

"Hurry, please!" Beulah implored. "Every second counts. We've got to find Cliff."

THE pin point of flame swung erratically over the blank-seeming wall. When Kerry spoke again his voice was queerly hard. "That's another damn tough job. The Eternal Wanderer doesn't give up its secrets. It is *you* who are wasting time. We should be manufacturing invisibility magnets as fast as we can, install them in every craft we can seize, man them with loyal men, and slam the Martians to hell. If Cliff could only hear us, those would be *his* orders."

"I'm sure of that, Kerry," Warren Moorhouse said quietly. "But Beulah insisted——"

"Do you think I could rest a moment," she said, "knowing that poor Cliff is somewhere, suffering Heaven knows what tortures? Even now—it may be too late—to do anything."

"It was too late before we even started," Kerry muttered. Aloud he merely said: "How certain are we of getting him back?"

"We aren't," Moorhouse answered. "It's just a chance. But Harg, before he died—for pretended disobedience to Vesgo's orders—whispered the secret of the Wanderer to me. We had been rather friendly before Vesgo achieved delusions of grandeur. He was able to produce a matrix dissociation, but was baffled by the problem of reintegration. I *think* I've worked that out. Cliff's hide-out on Earth was rather completely equipped."

Kerry grinned painfully under his banda-juice mask. "Poor Cliff! He worked hard enough to make a go of his rebellion. If it hadn't been for that damned Martian spy who was your secretary—— Hello! There's the panel."

The brilliant pencil of flame edged along a thin, almost invisible crack in the curving rock. "I watched pretty carefully when they led Cliff out."

The three Earth people made their way cautiously past the empty tiers. Beulah's heart thudded so loud she was certain it could be heard on the planet Mars itself. She had risked the possible success of a new uprising against the tyrant by her insistence on this insane venture to rescue Cliff—Cliff, who had become an unimaginable series of beings, who had been thrust into a doom beyond all human conception. She choked back a sob. Her father *must* succeed. He had been a weakling too long, a striving after moderation. Now he must be ruthless, hard, prove his title as the greatest scientist in the solar system.

The torch illuminated the panel, reflected yellow glow on her father's haggard face, painted false shadows on the falser Earth elder with the banda-simulated wrinkles. His lean, brown fingers were moving deftly over the surface. They held suddenly, pressed.

"There she goes," he grunted with satisfaction. A black hole yawned before them. They stepped through slowly, Dongan guns wary in their hands. But the lift was deserted. The silence was oppressive. Kerry fumbled for the button control, and swiftly, silently, they rose to the surface, past the prison chamber in which Cliff had been immured, into the space unit on the surface.

Kerry flicked off the betraying flash. With infinite caution they edged their way in, ready to blast a path should an alarm be raised. But the unit was dark, and, through the quartz-inclosing bubble, they saw the dark, grim shadow of the guardian cruiser. The search beam which should have been trained on the unit was blank; its sentinel asleep.

"What a break!" Kerry exploded joyfully. "Get busy, Mr. Moorhouse; it's your deal from now on. I'll stand guard."

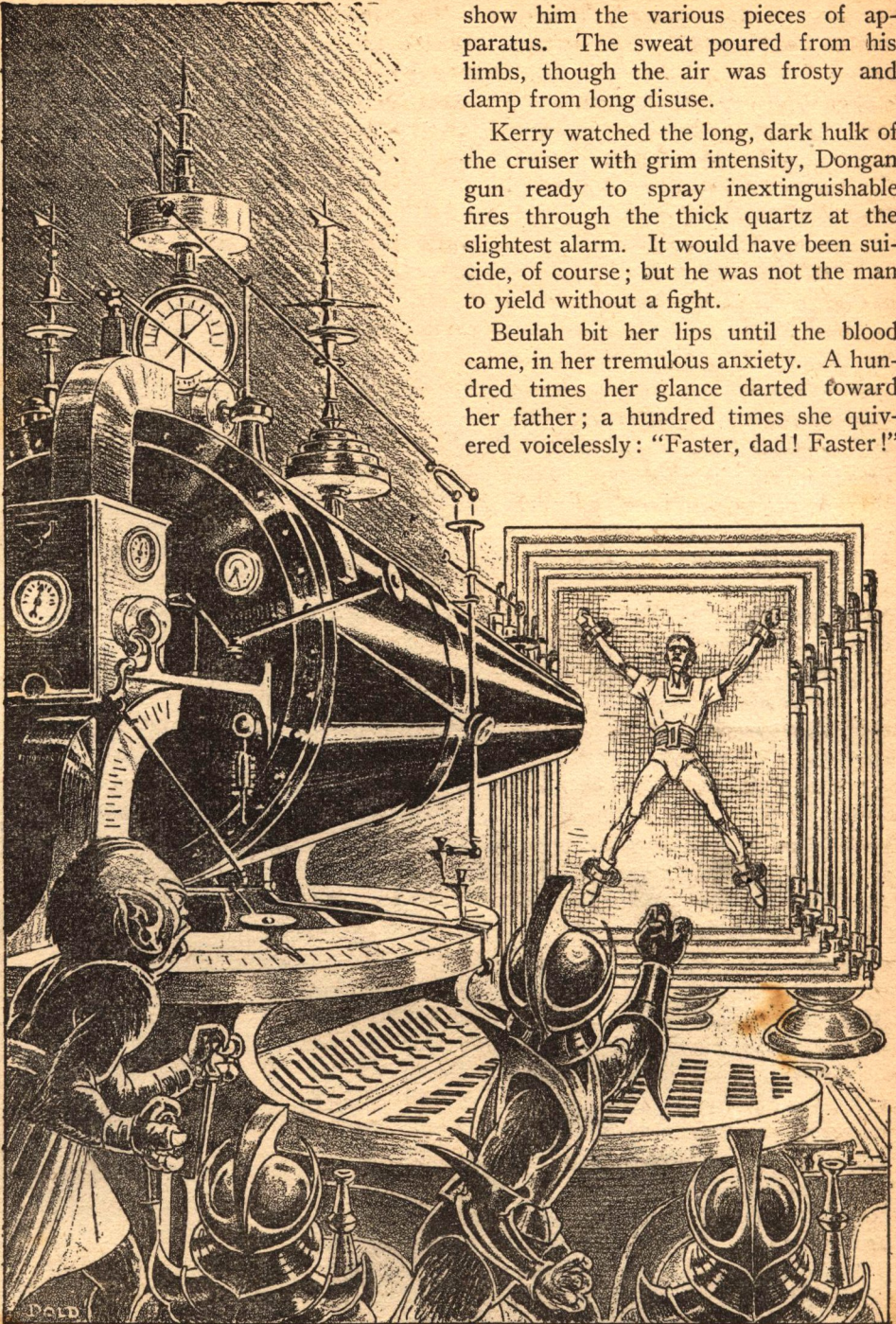
Beulah squeezed her father's ascetic hand with desperate pressure. "Dad!" The single exclamation betrayed more than a volume of words. He understood, patted her trembling shoulder, and went to work. Harg had sketched the various parts of the matrix machine for him with feeble, yet frantic haste, as he lay on the sodden soil near their hide-out, gasping out his life blood. Moorhouse had found him, cut down by a glancing ray, had tried to ease his last moments.

FOR OVER AN HOUR Warren Moorhouse worked as he had never worked before. The baleful overhead disk of Mars cast an eerie, and barely sufficient glow into the space unit to

show him the various pieces of apparatus. The sweat poured from his limbs, though the air was frosty and damp from long disuse.

Kerry watched the long, dark hulk of the cruiser with grim intensity, Dongan gun ready to spray inextinguishable fires through the thick quartz of the slightest alarm. It would have been suicide, of course; but he was not the man to yield without a fight.

Beulah bit her lips until the blood came, in her tremulous anxiety. A hundred times her glance darted toward her father; a hundred times she quivered voicelessly: "Faster, dad! Faster!"



Tubes whined and sizzled; giant disks whirled in a blur of motion—

and withheld the crowding words. Poor dad! He was doing his best. She would only disconcert him with speech. But the minutes were precious. Soon space day would be stirring, and the Martian cruiser would awaken to routine activity. In which case it would be impossible to avoid discovery.

"Cliff! Where are you? Come back, Cliff!"

Then Moorhouse stepped back, said in tired tones: "That's about all I can do under the circumstances. Get away from those metal slabs. I'm ready to reverse the process. I've staked everything on the function of the square root of minus one in the brain machine. If that integrates properly to positive unity, then, according to my theory, the entire matrix equation— $qp-pq-ih/2$ —should reintegrate, and reproduce Cliff exactly as he was before he was dissociated." He shrugged weary shoulders. "At least, I hope so. Ready!"

Levers swung downward; switches knifed; buzzers pressed. The great tubes glowed into being. The brain machine clanked and whirred and spun. The light blazed in their dazzled eyes; the noise was deafening to their straining ears. It was impossible that the Martians on the silent cruiser would not see, would not feel the vibrations even through the thick quartz.

It was a peculiar sensation. Everything seemed negative, reversed. The flame in the tubes was violet, but withdrawn as if it were beyond the spectrum, made somehow visible to mortal eyes. The clash and slam of meshing gears sounded recessive, remote, as if the beating waves of air were concave rather than convex. The funnel sucked in luminance from the serried metal plates, draining the circumambient atmosphere of all vitality.

Beulah gripped Kerry's arm suddenly, cried out in suppressed accents. "Kerry! Dad! Look! The last plate!"

THEY STARED at it breathlessly, forgetting their precarious situation, forgetting even the Martian cruiser at anchor beyond the quartzite shell. The largest metal slab had sprung into gleaming, tessellated life. The rainbow-hued squares glowed and shifted and played with magnificent iridescence. Then the kaleidoscopic colors formed a vague, shimmering, but unmistakable pattern—the two-dimensional pattern of a man!

Beulah wrenched herself away from Kerry, flung blindly forward, arms outspread. "Cliff!" she implored. "Cliff! Come back to me!"

Her father caught her stumbling figure just in time, pushed her violently away from the sphere of the sucking rays. "You'd have killed him, killed yourself!" he cried.

They crouched in the farthest corner, watching, eyes popping, as the phenomenon unfolded, became more startling in its awesomeness. The flat, dissociated thing of myriad hue on the final screen flickered, vanished. At once the fifth screen blazed into an ecstasy of colors; a pattern formed, clearer, more distinct, but still ineffably vague.

From the fifth to the fourth, then to the third, leaping across the interval to the second upright plate, more and more substantial at each jump, coalescing dissociated states through a lesser and lesser number of squares, trembling more and more to a three-dimensional state.

Warren Moorhouse crouched, hunched over, holding his breath. A queer unease flowed through his senses, stinging his brain to furious activity. Something was wrong about that reintegrating figure; something had been horribly wrong with his calculations. Even as the tessellated luminance poised on the second plate for its final, ultimate leap to the first and normal slab, the solution burst on Moorhouse with shattering realiza-

tion, brought a great cry from his pallid lips.

"My Lord! What have I done! I made a mistake! The equation is wrong. I integrated 'i' to positive unity, but that reverses the positions of 'q' and 'p.' He will be 'pq=qp,' not the other way round. Heaven knows what he'll be!" He darted forward frantically, grasping for the master switch. "Cliff! Cliff! Wait! don't come back yet!" He was shouting as if the poised simulacrum on the second plate could actually hear.

"It's too late," said Kerry, pulling back against the solid wall. For the first time in his reckless life he was afraid.

Beulah was moaning softly to herself. Even as Moorhouse's fingers clamped on the switch, a solid, three-dimensional form surged through the first and ultimate plate, bulged into the circlets of the chaining manacles. The figure stirred, blinked, looked around the space unit.

Moorhouse felt his fingers stiffen and fall away from the useless switch. Kerry flung a warding hand over his eyes, pressed backward against the unyielding quartz. Beulah held herself taut. Her voice was a shriek, a wail of agony. "Cliff! Is it you?"

The figure brought its enigmatic glance back to the three mortals crouching in utter fear before him. There was something terrible about that glance, about that queer, immovable face, about the contours of his body. They were human, yet something more—or less—than human. It was recognizably Cliff, yet a Cliff of a different order of being.

Moorhouse was mumbling to himself over and over again: "I reversed 'q' and 'p'; the equation is different. What have I done?"

THE INTEGRATED BEING that had been Cliff Havens said nothing. No mortal sounds could ever emanate from

those rigid, superhuman lips. He seemed slightly out of line, strangely angular and distorted, as if he were only the three-dimensional facet of a four-dimensional creature. He was beyond these cowering mortals, who once had loved and been loyal to him; his glance swept them and reported back to a brain in another dimension; he was not their kind, never could be!

"What has happened to you, my dear?" Beulah cried out in terrible anguish. This creature who strangely resembled the man she had loved was remote, alien, thinking thoughts that were not hers, feeling emotions that were beyond her. Suddenly she was afraid of him.

Dazzling light swept the darkened chamber. A fierce white blaze pierced the quartz, laid bare in every detail the matrix complex, the crouched figures of the Earth people, the strange apparition still outstretched in a gigantic X on the metal slab. Warning signals clanged and reverberated through the great hollow of Deimos.

"They've seen us," the girl cried out.

Kerry ripped out an oath, tugged furiously at the Dongan gun he had thrust back into its sheath.

The Martian cruiser quivered, lights blared forth from every view porte. The lone sentinel bounded to his feet, flame disintegrator level. The yawning orifices of force trained into position.

But, even as Kerry brought his gun up and forward, his pressing fingers held rigid; his body froze immobile. Beulah was a marble, backward-shrinking statue. Moorhouse toppled slowly, caught off balance, arms uplifted. A paralyzing cone had pumped its frozen waves of force into the space unit.

"Got them, commander," said a Martian gunner hoarsely. "Look! They're the Earth dogs his magnificence was after."

"Good work!" approved the officer. "There's a reward for their capture. You'll get it. But who—what is that thing on the metal plate?" His tone of surprise changed swiftly to shrill alarm. "Quick!" he squeaked. "Blast the disintegrators; trip the radiolite bombs—ah-h-h-h!"

He slid slowly to the deck of the cruiser. All around him gibbering cries of fear stifled in tight Martian throats. Gunners crashed unmoving before their weapons, stared sightlessly upward; brown Martian giants in the hold, tumbling out of beds at the signal of alarm, fell the remaining distance with sickening plops. The lights blared, the search beam held unwavering, but the grim battleship was a thing of death and utter silence.

Three mortals, rigid in the grip of the paralyzing cone, stared with eyes that could not move, that could not refocus. The being on the upright slab, the strange creature that looked like a distorted Cliff, had moved. He stepped away from the tessellated metal, passed through his inclosing manacles as if they did not exist.

He turned toward the Martian cruiser, aflame with lights, resounding with the shouts of its crew, and extended his hand. At once the shouts died down, vanished. No disintegrator portes belched their cargoes of destruction, no radiolite bombs fell to blast Deimos out of space.

He turned, faced the frozen Earth people. His arm went up again. At once the invisible bonds that held them fell away, the frozen cries thawed and hurtled on their interrupted flight. Kerry mumbled oaths, felt the hackles rise on his skin. Moorhouse, prone on the floor, mouthed a meaningless succession of "p's" and "q's." The girl flung out her arms imploringly toward the simulacrum of the man she had loved, then shrank back, chilled and afraid, from the fathomless calm of his angular face.

For a long time he looked at and through them, as if they were no impediments to his vision, as if he beheld the workings of their inner mechanism, as if he saw the structure of the universe entire.

Then he seemed to have come to a conclusion, engineered in a remote dimension to which the apparition was but a single facet. He had not said a word; his lips had not yielded from their taut, fixed lines. He strode forward, unhesitatingly, straight for the farther wall that led to outer space.

Beulah found her voice again, cried out terribly. "Cliff! Come back!" Then she fainted.

Cliff, an integrated matrix of reversed components, had passed through the thick quartz walls as if they were thin air, was seen striding at increasing speed through the fathomless depths of outer space—

V.

THE REST is history. The telling of it would take volumes in itself. But on Mars, seated in his spidery quarters atop the topmost structure of the capital city, Vesgo lolled in smug self-satisfaction. The televisors flashed in rapid succession, bringing him reports from his captains and lieutenants on the spaceways, from the subject planets, from the far-flung asteroids.

Everywhere matters were proceeding according to schedule. All revolts had been crushed in bloody ruin; everywhere the Martian guns dominated and controlled. And he, Vesgo, was lord of Mars, and therefore lord of the solar system. Already his faceted eyes turned speculatively to the frozen outer planets, leaped across the reaches of interstellar space to the distant stars themselves. There were no limits to his soaring ambition.

Two things only marred the surface of

his contentment: one was the fit of rage in which he had ordered Harg's death for disrespect to himself. The scientist had actually balked at further use of his matrix dissociator on the rebels of the system. Unfortunately, no one else of Mars knew quite how to manipulate its complicated controls, and this most ingenious instrument of compulsion was perforce useless and idle.

The second was the continued failure of his cohorts to discover the whereabouts of Moorhouse, erstwhile timorous delegate on Earth, his rebel daughter, and that red-haired demon, Kerry Dale, second only to Clifford Havens as a trouble-maker. Well, at least Havens was gone, vanished into the unknown, spread inextricably to the farthest reaches of the universe. Never again would he—

Vesgo gaped, his thick brown mouth wide open, his saucer eyes extended to the bursting. There, right before him, within the guarded sanctum of his chamber, supposedly impenetrable to hostile forces, stood the Earthman he had just consigned in his thoughts to the farthest reaches of space and time.

"Clifford Havens!" he squeaked throatily. It was impossible, incredible! He had simply conjured up a vision with the heat of his own imagination. The apparition had seemingly glided through the containing walls, two thousand feet above the ocher clay of Mars. And that face, that strange side distortion, as if he had been flattened slightly in the process, that dreadful, silent expression in his eyes—

Vesgo's three-fingered paw flicked like lightning to a button—the alarm signal that would bring his guards catapulting, that would automatically turn on the paralyzing ray, seal all outside entrances and exits. His finger pressed convulsively. Nothing happened.

Cliff said nothing, his silence more terrible than any speech. He lifted his

arm. Vesgo shrieked, collapsed into a huddled, moveless heap. Later, when a guard opened the sealed chamber after repeated unanswered signals, he found the lord of the solar system dead, eyes bulging wide on some dreadful, invisible scene. There was no one else in the chamber.

AT ONE HUGE STRIDE, terror stalked the Martian warriors throughout the spaceways. In no place, no matter how remote, were they safe from the inexorable vengeance of the man they had thought to have been rid of for all time. Everywhere the dread word flamed: "The Eternal Wanderer has returned!" and the bravest of the arrogant giants cowered and were afraid.

He struck wherever he willed and whenever he desired. The legions thrust up impenetrable walls of force, hid behind constant blasts of disintegrating rays. Yet, sooner or later, in battle cruisers, in walled forts, in laboratories sealed with the mightiest barriers known to science, Cliff appeared—passionless, expressionless, his face and mien terrible in its abstract façade—and the groveling wretches shrieked and died.

The three Earth people who witnessed his strange return had fled in all haste back to Earth. The invisibility magnet passed them through the still vigilant space fleets of Mars. Back in their subterranean hide-out they heard the incredible news and wondered. Moorhouse shook his grizzled head in awe. Sheets on sheets of furious calculations, intricate formulæ, lay in heaped disorder before him.

"All the equations," he pointed wearily, "indicate that with a reversal of the matrix coördinates, 'h,' the quantum of action, is raised to the fourth exponential power. That can mean only one thing: that the energy states of the reconstituted being we once knew and loved as Clifford Havens require a four-

dimensional continuum. That would account for his ability to appear almost simultaneously in widely separate places, to pass through three-dimensional walls as if they were so much unresistant air.

"What we had seen appear on the metal plate back on Deimos was merely a three-dimensional facet of him; the rest of Clifford Havens is beyond our comprehension. That is also why our weapons do not harm him, and accounts for the strange powers that, emanating from a fourth-dimensional stratum, kill though invisible to our eyes."

Kerry girded himself grimly. He had cast off his aged disguise, and was once more a young man with powerful shoulders, flaming thatch of red hair, snub nose and freckles. "I'm tired of doing nothing," he declared. "It's time we poor limited mortals do some fighting on our own account." Then he was gone.

But Beulah remained behind, listless, more pallid than ever. What mattered it to her that the solar system was being saved from slavery to the Martians; what mattered it that Clifford Havens was the originating cause? He was lost to her forever; more thoroughly, more potently even, than if he had remained the Eternal Wanderer. Then, at least, there was always the hope of bringing him back.

But now that he was back—— His face has been utterly expressionless up there on Deimos; yet he must have sensed her physical shrinking, the cold wind of alienness that had enveloped him. Suddenly, to her father's startled surprise, she was in his arms, sobbing aloud the torture of her soul.

URGED ON by the flame of Kerry's presence, enheartened by the heaps of Martian dead, first Earth rose in savage revolt and slew the few remaining Martians who had thought to hide from the invisible death. From Earth, rebellion

spread to Venus, to Mercury, even to Mars itself, where a minority party had long protested the lust for conquest that had actuated Vesgo and his cohorts. Harg had been the secret head of the movement.

Martian overrule was swept out of existence; the planets once more regained their ancient independence. The spaceways filled again with peaceful freighters. The ravages of war were soon healed, and peace and plenty revisited the solar system.

Warren Moorhouse became chief of Earth, Kerry Dale commanded the Interplanetary Patrol, and the Interplanetary Court was reconstituted—no longer on Deimos, but in a huge, sealed cavern on Earth's Moon.

Precautions were taken against any future seizure of power. The planets rested from their warlike labors, took on again the decent appearance of ordered prosperity. One vestige alone remained of the days of chaos.

In the great new hall of the Interplanetary Court the magnificent central chair of the titular head was vacant. Nevertheless, before any decision was ever announced, the four judges bowed once before the seat of reverence. It was reserved for Clifford Havens, already a legendary hero.

But Clifford Havens had vanished. The four-dimensional being had withdrawn into the fathomless reaches of another dimension. Beulah was inconsolable. Daily she drooped, and only smiled wanly at all attempts at consolation by her father, by Kerry himself in his infrequent trips to Earth.

"It's all my fault," she declared passionately. "Cliff saw the repulsion in my eyes that fatal moment on Deimos; he has determined never to come back."

"Nonsense!" retorted both men gruffly, to hide their own discomfort. "He is now a being of a different order. Our Earthly emotions cannot touch him;

no doubt we are beneath his contempt—mere worms to his extended comprehension.” Which clumsy attempt at consolation only made Beulah more inconsolable than ever before, much to their astonishment.

Then, one day, during one of Kerry’s hurried visits, Cliff appeared before them. The girl saw him first, started up with a great cry. Her arms went out. “Cliff, darling!” she cried. “I knew you’d come back.”

He gazed at her with an almost god-like expression, remote, unconcerned. Then he flung out his arm. Another gesture, and writing traced itself on the open sheet before Moorhouse. Then Cliff vanished.

The paralysis left them. As one, they rushed to the desk. “Go to the matrix dissociator on Deimos,” read the memorandum. “Do thus and so.” The complex of machinery was drawn in exact detail, and careful directions followed.

As fast as the fastest space liner could hurl them through the warp to Deimos, it was not fast enough for Beulah. “Hurry!” she moaned through clenched teeth, while Kerry merely grinned, and her father looked serious.

THE SPACE UNIT was just as they had left it. No one had been allowed on Deimos since the revolution. Once again

they fled up the secret lift, and stood in an agony of impatience within the quartz unit while Moorhouse followed directions with frowning brow and concentrated air.

Again machines whined and tubes flared with faint violet. Again a pattern shimmered on the last plate, was pulled irresistibly from slab to slab, until Cliff Havens appeared, taut and drawn, within the chains that held him prisoner against the frontal upright.

Barely was her father able to shut off power before Beulah had hurled herself toward the man suspended in the manacles. Her fingers went trembling over the dear, familiar features—no longer distorted, no longer expressionless. Their lips met and clung desperately, while Kerry sprang the manacles open with feverish haste.

“Thank Heaven!” the girl whispered over and over.

Cliff settled back with a deep sigh. There was a queer, dazed look in his eyes. “It’s mighty lucky you rescued me in time,” he said. “I thought you’d never come. In another second Harg would have made me into a matrix—the Eternal Wanderer.” He looked suddenly past the three. Surprise twisted his features. “But what happened to Harg and Vesgo? How did you get in here?”

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THE PATH

*Out in the ether a dart of red-hot metal
tore on toward the solar prominences——*

by Raymond Z. Gallun

ON AND ON, Fenwick, you shall drift, helplessly, toward the stars. You shall grow old; madness, perhaps, shall come to you, and at last you shall die. But still this metal prison which you have built shall continue to carry your body on toward infinity. We could have killed you, Fenwick; but this is a better punishment. You can think and suffer and invent your fiendish weapons; but you are harmless, for you can never return to the vicinity of Earth. It is just as you planned, Fenwick, only different——”

Those words were ringing in Paul Fenwick's ears. In memory he could see the broad, impassive face of the man who had uttered them, and the triumph shining in his eyes. That man, and his allies, had conquered the world. Regimentation and dictatorship had surmounted the last stronghold of democracy. The freedom for which Paul Fenwick had fought with all the courage and scientific genius he possessed was at an end.

The conquerors had sealed him in this great metal shell which he had made. In it were stored water and enough concentrated food to last a lifetime. The air-purifiers would supply him with oxygen. Aboard the projectile there was even a tiny but well-equipped laboratory, which, as an ironic jest, he had been allowed to keep. By means of Fenwick's gigantic space catapult, the shell had been hurled into the void. Now, at a speed of many miles per second, it was moving away from the Earth and the Sun, toward the depths of the interstellar wastes.

Paul Fenwick lay now, strapped to his

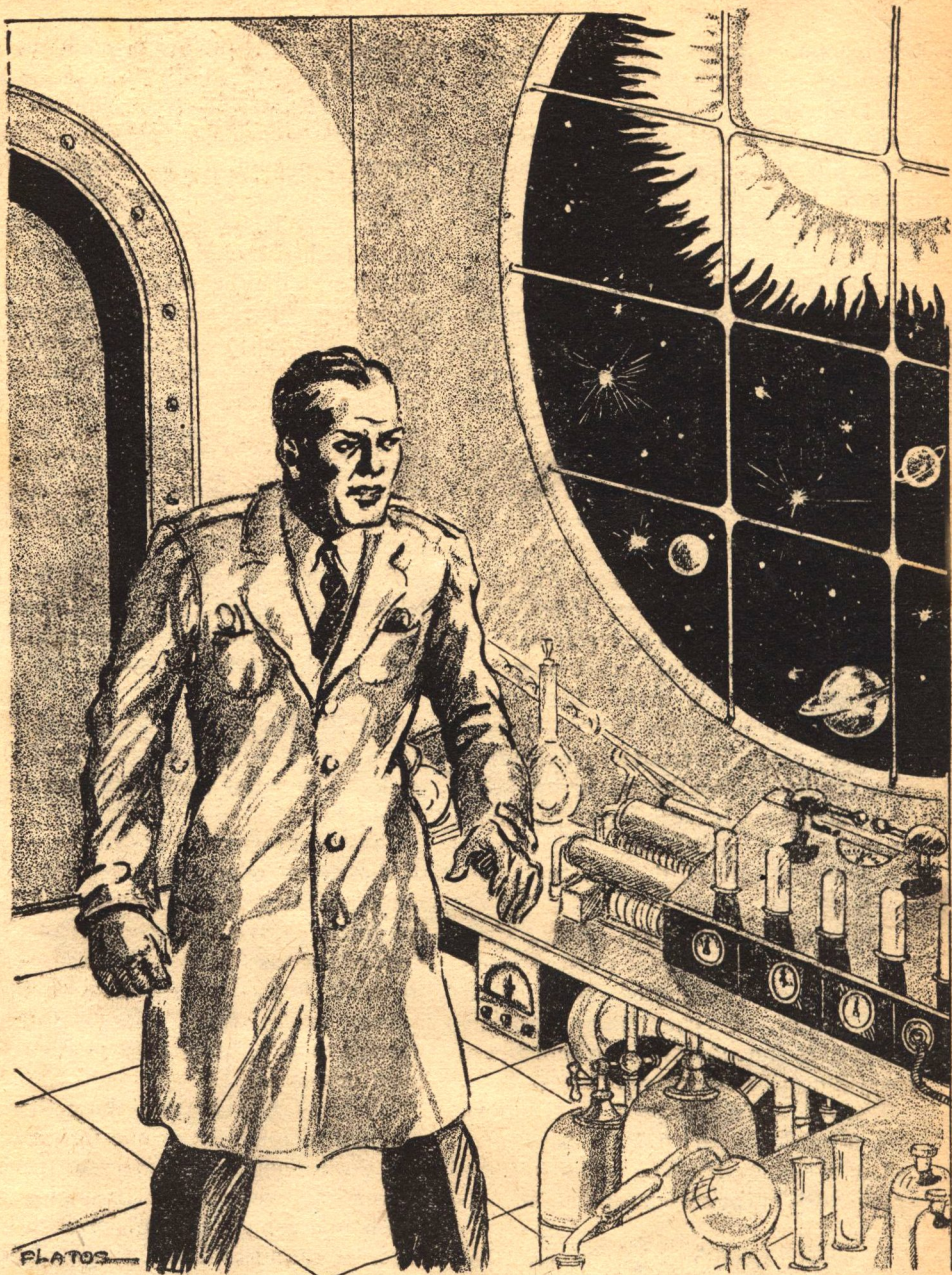
bunk, in the central compartment of the car. His gray eyes were grim, but occasionally a little smile of rueful humor twinkled at the corners of his mouth. Paul Fenwick, though a wizard of science, and recently the sole hope of a lost cause, was not yet forty. Had he been older, perhaps hope would have been entirely dead within him.

As things were, he was almost resigned to his fate. Maybe it was only methodical habit that caused his mind to toy with the memories of past events in an effort to find some slender way to help his friends on Earth.

He remembered the horrors of the war of conquest; and he remembered the first fierce thrust of acceleration when the projectile in which he was captive had begun to build up speed in the circular tunnel of the catapult. For hours the acceleration had gone on in that tunnel, which was round like a vast race track. Exploding hydrogen and oxygen, confined behind the shell by means of a system of huge reciprocating valves in the tunnel itself, had furnished the thrust.

At last, when sufficient velocity had been attained, other valves had worked. The projectile had been hurled into a tangential tunnel slanting up into the air. It had cleared the tunnel, and had torn a fiery path up through the atmosphere. Now it was in space, where it seemed destined to travel on steadily until the end of time.

FENWICK GRIMACED. No, there was nothing in these memories that was



Suddenly the idea came to him. A weapon would not grope across the emptiness of space—but his secret code—

of the least help to him now. The straight course of the shell seemed fixed and unalterable. He could no more change it than he could change the orbit

of the Earth. The projectile had no propulsive mechanism of its own; and that he might invent and build one was an obvious impossibility. His little labora-

tory contained many materials; but the quantities of each were far too limited.

He shrugged. It was well to be philosophical about his helpless position. Once, not long ago, he had actually planned to go off into the cosmos like this. Space was still almost untouched by man. That was why he had constructed the catapult. Some day, he had hoped to shoot out into the void of his own free will. That a return to his native planet seemed impossible would not have deterred him; for such was his eagerness for knowledge.

The one objectionable element, which changed a boon to a plight now, was the realization that the freedom of his friends on Earth was over. They had been beaten, degraded, and enslaved. Many of them had been killed, and others would follow. The resentment he felt in consequence was maddening.

Slowly, Fenwick undid the straps which held him in the bunk. Weight was very slight here, and so he moved with caution. Now he raised his body erect, and drew himself across the compartment to a small door. He opened the door and entered the tiny cubby beyond.

This was his laboratory. Brittle starlight, entering through a port of steel-reinforced quartz, glinted on the glass and metal of equipment specially designed to function properly here where everything was almost weightless.

Fenwick looked toward the window, and toward the sharp stars beyond it. All of a sudden his face was a bronzed study of surprise—exasperation, almost.

It wasn't anything that he saw that caused this reaction. Something had popped unbidden out of his subconscious, and had grown clear in his mind.

Fifteen minutes later he had forgotten all about the problem of returning to the region of the Earth. Not that the problem wasn't important. Even radio waves, projected across the void in the

form of an efficient beam, could be received only if the distance were not too great. The gap between himself and his native sphere had already widened beyond that limit, for his bizarre cosmic exile was now several days old.

He was busy planning a weapon which he had thought of months before. He felt sure that he had sufficient materials to construct a small working model, if he could surmount all the technical difficulties of the invention. To iron out all those difficulties would take time, but he had plenty of that. The weapon would be a devilish thing, but to grope across the emptiness of the cosmos would not be within the scope of its powers.

Fenwick thought briefly of his old laboratory assistant, Frank Gerhardt, and he thought of the secret code they had used during the war——

FOURTEEN YEARS passed. All but a few men had forgotten Paul Fenwick. Those few cherished their memory in silence.

The world groaned under the weight of dictatorial oppression. Work, sleep, food, and play were all controlled by a routinized system. There was no freedom of speech. Men who dared, really, to think, kept their thoughts to themselves, unless they were courageous enough to pay the penalty of imprisonment or death.

Life was a gregarious thing that attempted to force every one into a fixed and docile mold, satisfactory to those in power. There was much singing and much marching; but underneath this mask of enthusiasm, hearts ached. Shallow minds, responding to lurid propaganda, with the devotion of fanatics, formed the backbone of the system. That was the reason that it had the strength to endure.

There had been revolts, but they had been quickly and horribly quelled. Thousands of the world's most gifted in-

habitants had been put to death. Science languished. There was no progress; instead there was retrogression. Only science, properly handled, could give Earth's teeming millions the necessities and comforts of a sane standard of living. Actual want was not far off in some localities. Gradually and subtly, barbarism was approaching.

Then, just a little more than fourteen years after Paul Fenwick's exile had begun, the change came.

It was in April, during the time of the annual conferences of the rulers. In London, Berlin, New York, and Tokyo, the master minds gathered. In each of these cities there was a splendid palace to house them. During the same hour, and in almost the same minute, they died.

No one had seen the small stratosphere planes that had flown high over each of the palaces, inflicting wholesale assassination. There was no flame and concussion of explosions, and no reek of deadly gas. The act of vengeance was brought about without such spectacular display.

An invisible radiation had done what nothing else could have accomplished. That radiation was antichemical. Within its field, normal affinities of one element for another were canceled, so that they could not combine. Fire could not burn there; internal combustion engines could not run; and life, being chemical, too, could not continue to exist.

FRANK GERHARDT, aging laboratory assistant during an era that had passed a decade and a half before, smiled a smile that was at once grim and gentle. There were a score of young men around him in his subterranean refuge.

"The leaders of oppression are gone," he said. "There may be chaos for a time; but the world has learned its lesson. It knows what it wants, and soon the readjustments will be made. Civilization is saved."

"Thanks to you, sir," a blond youth named Fellows amended fervently.

"No," Gerhardt replied. "I am not a genius. Thanks to—Paul Fenwick! I did not tell you before. There was much work to be done; and I knew that he did not want us to think of him then."

"But Paul Fenwick, if he is still alive, is now many hundreds of millions of miles from Earth," Fellows protested. "For fourteen years he has been drifting straight out toward interstellar space!"

"No," Gerhardt said again. "The conquerors thought that that was what would happen, and he thought so himself at first. But there was an oversight. At present he is not journeying toward the stars; instead, he is approaching dangerously close to the hot photosphere of the Sun!

"It is very simple. Let me explain: the shell in which he is sealed was shot into space, away from the Sun. For years it moved in that direction; but gradually solar gravity retarded its speed in exactly the same way that terrestrial gravity retards the speed of a stone tossed straight up into the air. The velocity of the shell was not sufficient for it to escape Sol's attraction. Presently the projectile began to fall back, at mounting speed, toward the Sun. You begin to see?"

"Yes!" Fellows burst out eagerly. "It all works out perfectly, according to celestial mechanics! Fenwick's prison is pursuing the path—of a comet!"

"Precisely!" Gerhardt commented. "A vast, elongated ellipse, one extremity of which curves grandly in the void, while the other extremity makes a tight curve around the solar sphere. No comet actually hits the Sun, because the latter is moving at a fixed rate through space. A comet begins to fall straight toward the place where the Sun is; but when it reaches that place, old Sol has moved on. The latter's attraction, how-

ever, causes comets to swing around the solar sphere, meanwhile giving them sufficient speed to go hurtling away into space again. Clear?"

There were awed nods among the group of listeners.

"While his car was following the orbit of a comet, Fenwick invented the apparatus which produces the antichemical radiation," Gerhardt continued. "He also built a radio transmitter of the beam type. Then, when his car had brought him back, near enough to Earth for communication, he contacted me, using a code which only he and I understand. Very carefully, he explained the details of his invention to me. I called you chaps, and the others, in to help. That is about all there is to tell."

"What of Fenwick now?" Fellows asked. "Even though he won't actually hit the Sun, his car will melt, and he will be burned to ashes!"

Gerhardt nodded slowly, a mistiness in his old eyes. Around him, young heads sagged in solemn attitudes of re-

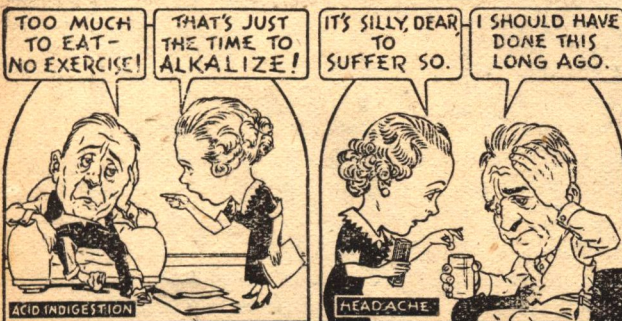
spect and worship. There was nothing to say, and nothing that could be done.

Out in the ether a dart of red-hot metal tore on toward the solar prominences. In spite of heavy insulation, the interior of the projectile was like an oven. Dark shields were over the windows; but through them was visible a swollen globe whose incandescent glory was dimmed to an ominous redness.

Paul Fenwick was busy with his instruments, making tests and observations. As always he was still the scientist. His face was haggard. Sweat streamed from every pore of his body. But in his eyes was a gleam of ecstasy. His fever for new knowledge was undimmed.

"Vacation at last," he muttered with rueful humor. "Responsibilities to home folks discharged. Hope old Frank made good."

There was a small vial of cyanide within reach. Useful stuff—cyanide—when the heat became too great to bear—



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A Study of the Solar System

Article No. 6 by John W. Campbell, Jr.



RED DEATH

DIED: Planet Mars, fourth of the solar system, at the age of 2,500,000,000 years, of progressive strangulation and severe dehydration. For the past 1,000,000,000 years Planet Mars has been very ill. Suspicion is strong that death has been slowly poisoning his system during this

time. Mars is survived by seven larger brothers; two others having died, Mercury dying of acute sunburn, and Pluto, who froze to death one night. Two infant satellites of Mars, Phobos and Deimos, also died before him.

"It is understood that his corpse will lie in state at the present address, 140-

000,000 miles from the Sun, for ten or twelve billions of years."

We'll leave that in the files for the moment, along with the obituaries of a dozen or so other personages throughout the world who are seriously ill. For Mars is not quite dead as yet. But the slow, slow poison death is administering has nearly finished its work.

His breath is very shallow now, and his body cool. He has an atmosphere; there is no doubt of that. But by various means we have found that there is less oxygen over 1,000 squares miles of Mars than over one square mile of Earth. One thousandth the atmosphere Earth possesses! For the purposes of fiction, that atmosphere has been enormously exaggerated. It is no "mountaintop air, thin but sharp and refreshingly cool."

Here on Earth we have a different name for that condition; we call it a fairly good vacuum. It's thin, all right, but what kind of mountaintop would have that kind of air here on earth? No man has yet climbed to the peak of Mt. Everest, 29,000 feet, even with the aid of oxygen bottles. In balloons, where men had only to sit and the most violent effort was opening a stop cock on an oxygen bottle, or pulling a valve rope, over 40,000 feet was attained.

When stratostats were built, in their protected, inclosed gondolas, elevations of ten, then twelve miles were reached. Into the stratosphere! The air there, unbearably attenuated, at an elevation three Mt. Everests piled atop each other would not reach, was approximately one hundred times as dense as Mars' surface atmosphere.

The mountaintop referred to above must be the top of a mountain approximately as high as twenty unscalable Mt. Everests superimposed. Otherwise that statement is fairly descriptive, with the understanding that the one "refreshed" has a remarkably stubborn constitution.

The air is sharp, all right. It is composed, apparently, of a gas as sharp as chlorine—ozone. At one time ozone was considered healthful and, in fact, beneficial, because of its germicidal powers. It is remarkably effective in destroying germ life, as effective as chlorine, and for much the same reason. Ozone is a special type of oxygen molecule, just as diamond is a special form of carbon. Oxygen gas is normally O_2 , while ozone is O_3 . Ozone will attack even such stubborn metals as silver, which oxygen leaves untarnished; it is not surprising that it will also attack life tissues.

EARTH is protected by a layer of ozone in the upper reaches of the atmosphere, 100 miles above the surface, where it is about one one-thousandth as dense as at the surface. There cosmic rays, electrons shot out by the Sun, ultra-violet radiation and a number of other effects produce ozone from oxygen, and the ozone absorbs the short ultra-violet radiation which is dangerous to our race.

But the air of Mars is suitable for the production of ozone at the surface, so we would probably find that Mars was, indeed, equipped with a remarkably sharp atmosphere.

The coolness would not be refreshing to anything less thoroughly insulated than a polar bear. The gentle tropical night of Mars would put a Montana midwinter blizzard to shame for temperature; by 10 p. m. at the equator, it has reached about minus 40 C. Mercury freezes at that temperature. By dawn, it would be cold enough to make a lead bell ring, and you could use a solid mercury clapper.

The planet has not, you may infer, what we call "temperate zones" on Earth. It is even colder there at night. In midsummer, at 12 midnight, the temperature curve might surprise us badly: minus 40 at the equator, minus 30 or

so at about 20 degrees—for in midsummer the Sun is north of the equator, just as it is on Earth—then minus 50 at 50 degrees north, and finally, at the north pole, *twenty degrees above zero!* And at noon the hottest part of Mars would be the north pole!

Life on Mars will evidently have its troubles, if it has to go through a super-cooled cold wave every evening, and it must at the equator. But not so at the poles. The Martian poles are Mars' nearest approach to a garden spot—for the excellent reason that the Sun never sets there for ten long months. Half a Martian year, the north pole is lightless and heatless, save for the thin, un-earthly cold winds that sweep over it. But they do bring a little heat. And they bring all the poor moisture of Mars there and drop it as hoarfrost that, by the time the Sun shines on it at last has built up to a depth of approximately 14 inches.

At last, when the Sun does come, it stays a good long while—ten months. First the ice melts. The ground becomes warm, and it is moist with the melted ice—an ideal spot for the plants. They sprout like mushrooms, in all probability, in the next month. And during that month they soak up all the water they can get, because that is going to be *all* for that year.

We on Earth don't know what a dry place is. They have wells in the Sahara! There is more water under the Sahara, by far, than on the whole planet of Mars. The air isn't dry; it is dehydrated. One of our desert cactuses would die of drought in a day out there. A desert lizard would curl up into a little, dry puff in ten minutes, even if he could stand the practical vacuum.

There is plant life, it is certain, inasmuch as there is some oxygen there. Most of it, in all probability, is highly seasonal, flourishing enormously in the ten-month summer, and going to unkillable seeds in the winter.

At the equator there may be some type of plant capable of resisting the cold. A possibility would be a plant with a barrel-shaped body, almost spherical, to reduce the surface-per-volume ratio, and filled with water. The leaves of our hypothetical plant would be large, thick, furry things on long, slender stalks, and capable of a large degree of motion. About an hour before Sunset the leaves would pull in and wrap tightly about the body of the plant, acting as a thick, warm blanket about the water inside. The day's heat—about room temperature on Earth—would be stored in the water, and preserved sufficiently by this system to permit life.

ANIMALS? Perhaps, but they would lead an even harder life. Thin as that air is, plant life can point to a better record right here on Earth. Plants now live on one two thousandth of our atmosphere! They weren't forced there by absolute starvation, either; it was the savagery of the competition for the last dregs of carbon dioxide that taught them to live on less than half of a tenth of one per cent of the atmosphere.

They need the water in the air, of course, but the carbon dioxide is their food, and if they can get along on .04 per cent CO₂ here, they ought to make out on a thin atmosphere on Mars. But they can do it only because they sit tight, and don't waste their precious energy, the hard-won gains from Sunlight, on useless moving about.

So if there are animals on Mars, they may eat plants, and breathe oxygen and give off CO₂, but they are not going to be rash about it. They have to live in what any Earth animal would call a vacuum. That takes *lungs*; big lungs, and the more the move, the more lungs they need. That would be all right but for one thing; any membrane that passes oxygen and carbon dioxide is just as likely to pass water. They can get oxy-

gen, and they make CO₂, but they are not going to get more water very easily.

If there are any animals, they would admire with awe the immense activity and terrific mobility of a snail or turtle. And life for them would be too severe a struggle to allow any leisurely contemplation of things in general. The late Stanley Weinbaum's "Oscar" would be the ideal intelligence on Mars.

But they'd want fur. The nights they experienced would be enough to convince anything of the necessity of fur—thick fur. The Sun vanishing below the horizon, unimpeded by an atmosphere almost nonexistent, setting abruptly, night could come in within two or three minutes of the Sunset, not the forty-five minutes it takes on Earth. Then the stars would shine down, brilliant, madly flickering and dancing stars in the thin air that cooled off like an extinguished electric light. By midnight, when the cooling had practically finished, the stars would scarcely twinkle, still and immensely more brilliant than we know them, colored with their natural variations in that thin air.

The nights of Mars would be somewhat brighter than our Moonless nights, for more light would come through from those stars. Moonless? The famous "hurtling moons of Mars"! With a practiced eye you could find near-by Phobos, and with a little trouble, Diemos. The surface of Mars, red, and "brightly lighted by the two near-by moons" is a fiction, so far as the light goes. Jupiter, 400,000,000 miles away, gives practically the same amount of light as Diemos, only 12,000 miles from the surface of the planet.

Jupiter is brilliantly clouded, so reflecting much of the Sun's light, while Diemos is a jagged, broken boulder, utterly airless, practically black in black space. And Jupiter is 86,000 miles in diameter, some ten or twenty thousand times as large as the satellite. Phobos, only 3,725 miles from Mars' surface, is

brighter, of course, but it, too, is simply a dead rock in space, a few miles through.

So near the planet, Phobos races around in a little more than seven hours, while the planet turns in a little more than twenty-four. Three times in a single day, Phobos goes around the planet, twice in a single, long winter night at a latitude corresponding on Mars with that of London on Earth. And, unlike our Moon, it rises in the west and sets in the east, overtaking the planet in its rotation. Further, it rises as a half moon, crosses the sky as it becomes full, finally setting in the last half. Twice in a night it races through these phases. But also, it is, because so very near the planet, very likely to go into total eclipse instead of fullness. Mars is only 4,000 miles in diameter, but large enough to readily and frequently obscure the tiny satellite.

Diemos, on the other hand, presents an unusual situation. It circles Mars in about thirty hours, while Mars turns in the same direction in twenty-four hours. Thus, in one day, Diemos loses a bit in the race, but only some six hours. Diemos is above the horizon from any point on Mars for 66 hours, during which time it goes through all its phases twice. Naturally, because of the Sunlight, and the minute size, it could be watched only from some such place as the north pole, and then only telescopically, where the Sun was not above the horizon for months at a time.

BUT NO ONE watches them from Mars. Two infant satellites, born dead and airless, circling a near-dead world, killed by the strange, slow poison death uses on planets: iron. Iron has two oxides: ferrous oxide and ferric oxide, the ferric form holding half again as much oxygen.

Young planets contain largely the ferrous oxide in their rocks, the black oxide of iron—black lava, black basalt,

gray granite, black or gray or brown. Those dark rocks are old, igneous rocks that have never been weathered and rolled about by water and air. Red sandstone, blue and yellow sandstone, red muds—red oxide of iron, ferric oxide has stained them. Those unweathered rocks of the ferrous oxide are broken, turned, and ground up by water, and they slowly soak up oxygen from the air and become red muds, clays and sandstone.

One hundred and fifty tons of ferrous oxide absorb 16 tons of oxygen from the air. How many billions of tons of dark, ferrous rock make the titanic ramparts of the Himalayas? They'll all roll down as thin, red mud some day; down the ancient Ganges and the Brahmaputra and the rivers that have borne other mountains to the seas. But they'll carry away a little more than one tenth as many tons of oxygen from the air. Plants break oxygen out of water, out of carbon dioxide, but they can't break down iron oxide.

Where has the oxygen of the air come from? When Earth was new, there must have been more water. The hydrogen of that water, life broke free from the oxygen, and some of it escaped into space. Very slowly, because Earth holds fairly well, even so light a gas as hydrogen. But much more water was broken down than the oxygen

content of the air indicates. The rest of that freed oxygen you will find in the red soil of New Jersey, the magnificent reds and blues and yellows of the Grand Canyon of the Colorado, the unbelievable Painted Desert just beyond. You can find more in the red soils of all the world, and the thick, red sandstones of the world.

Earth is a heavy planet, and grips hydrogen fairly solidly. It did even when it was young, while in the making. Mars, one tenth as massive, with one third the surface gravity, gripped with only one tenth the power. Hydrogen escaped; long ago most of the hydrogen that was left when Mars cooled escaped. The oxygen didn't, because it was heavier. But the end was the same; the oxygen is there in the bright-red deserts, the rusted bones of the dying planet. Earth, with her vast seas, will live for a dozen billions of years to come. Mars has no seas, only thin hoarfrost that settles in the unutterable cold of her polar nights; life is struggling on the last thin trickle of moisture.

Death's planetary poison, iron, is finishing its work. Far more rapidly now, for Mars' atmosphere is sharp with that virulently active ozone that unites so swiftly with rocks and ferrous iron.

It is time to write up the obituary; ozone is hastening the red death of the red planet.

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The Last Selenite

*Unlimited power—unlimited
knowledge—and unable to use it*

by A. Macfadyen, Jr.

MANUSCRIPT found in a field
in Orange County, New York,
May 4, 1954:

Into the previously black and dense void there has come a faint gleam of light which slowly lengthens into a spreading crescent, like a newborn shard of moon. This crescent is bordered with a fringing streak of reddish light, shading off gradually into impenetrable darkness. The crescent, I know, will thicken and swell, broadening into a mighty red, green and silver sphere, with a halo of misty light.

It is the planet called Earth, the Sunward side beneath the searing rays of the rising Sun. And I and my companion are in the most perplexing plight in which men ever found themselves.

Let me say first that one of the effects of our experience was the interruption and derangement of our time knowledge, so that although we have since kept the day and hours with moderate accuracy, I cannot state on what day of what month in what year I write this. An unknown length of time has passed since the beginning of our experience which, however, as we have determined from certain observations, cannot be more than fifteen or twenty years.

I thus recognize that, in all probability, the world has long since given us up for lost, hopelessly and inexplicably disappeared. And such is the memory of men that it may be necessary to examine old newspapers and other records in order to establish the authorship and

authenticity of this message. The photographs I am inclosing will form irrefutable proof of many of my statements.

However, reference to the newspapers of the time will reveal that in the spring of 1938 great excitement and speculation were aroused by the announcement that the most ambitious stratosphere flight yet attempted was to be undertaken in May of that year. The ascent was to be made in a new balloon of unprecedented size, the spherical, sealed gondola of which was constructed from a novel magnetism alloy of incomparable lightness.

This combination was believed to be capable of setting a new altitude record; it was said by the sponsors of the flight, Stanton University in Stanton, Ohio, that the balloon would mount to a terminal height of between thirty and forty miles, completely smashing the old record of twenty-one miles, set in 1937 by two officers of the army of Soviet Russia.

Unsuitable weather was the cause of much anxiety and two false starts, but finally, at 4:30 a. m. on May 16th, the enormous balloon was moved out of the huge, unused hangar, in which it had been inflated with 400,000 cubic feet of hydrogen gas, at Akron, Ohio, and final preparations were completed. At 10:30 the balloon weighed off, gained altitude rapidly, and drifted in a direction west by north.

On board, as pilot and observer, were

AST-3



We were plunged into unrelieved blackness, shrinking with horror at our fate.

Dr. John M. Castle, and Dr. Miles O. Sherrill, of the department of meteorology and physics at Stanton University.

THE NEWSPAPERS have doubtless recorded that the balloon was invisible in a short time, that the periodically radioed messages from the two members of the flight indicated that satisfactory and unmarred progress was enjoyed for approximately five hours, in

which time the gigantic balloon mounted to a height of over twenty-eight miles, completely upsetting the previous record, and that in all this time nothing untoward happened.

They will have recorded the facts that at eleven miles the sky was a beautiful, deep blue; that at fifteen it was blue-black, and at twenty and over, an incredibly dense and limitless black. They will have noted that at six miles

the wind velocity had risen to one hundred miles per hour, from the east; that in the stratosphere, three miles higher, it was ten miles per hour, from the west; and that at higher altitudes it dropped to zero. This information was flashed at intervals by the compact and powerful short-wave radio transmitter.

They will have noted that at twenty miles the two members of the flight lunched on chicken-on-rye sandwiches, coffee and fruit, when the temperature of the outside atmosphere was a hundred and sixty degrees below zero, Fahrenheit, having fallen steadily from sixty below, at eleven miles; the temperature of the air within the gondola was eighty degrees.

And they will have recorded, perhaps with extra editions, that at 3:30 p. m. a radio message was received from the ship, stating that all was well, the balloon rising easily to peak altitude, having not yet touched its ceiling by perhaps ten miles, the height then being twenty-eight miles, two thousand feet; and that this was the last message which the flight sent to the world, far beneath through empty air.

And it will have become history that the flight was never heard of or from again.

The sunlight is spreading glaring radiance through the tiny cubicle, in which I, Miles Sherrill, begin the continuation of that enigmatical flight, illuminating the thinned features of my companion in mystery, Dr. John Castle. He is staring through one of the ports, at a huge, green, halo-silvered sphere spinning slowly in the utter void. He is silent.

At twenty-eight miles our balloon was rising steadily, though at a slowing rate of ascent, due to the rapidly falling outside air pressure. Castle, as pilot, was still occupied in dropping our service lead ballast, of which we still had some two thousand pounds in the usual form

of lead shot, one twenty thousandth of an inch in diameter. This was unloaded by means of a small cylindrical hatch in the bottom of the gondola, having another and inner valve, worked independently. I observed that the falling shot took the form of a perfect cylinder; there was no spreading effect due to air molecules as at lower altitudes.

My duties varied between attending to the Gieger-Muller cosmic ray counter, recording the frequency and intensity of the waves on a moving strip of sensitive film, making periodic photographs of the landscape below, making spectrographs of the brilliant, abnormally white Sun, and noting the color of the sky and the intensity of the light.

Almost all the world's atmosphere was beneath us now, although it is believed air would still be found at five hundred miles.

OBSERVATIONS made through a lower port, with calculations based on our small radio receiver with its loop antenna, indicated that we were over Sioux City, Iowa, near the Nebraska border. In the distant west I saw the regular wrinkles on the Earth which were the Rocky Mountains.

The sky was a deep black, and the light, hardly broken up and reflected by the tenuous molecules, was that of a clouded twilight. Our rate of ascent, as recorded by the variometer, was about eighteen feet per second. At twelve miles per hour we were speeding vertically upward, into the dimmed, darkened and rarified stretches of the upper air where meteors, icy missiles from the outer void, made each minute perilous.

At approximately thirty miles, when the pressure of the atmosphere outside, according to our delicate aneroid barometer, was less than that exerted by a millimeter of mercury, and the temperature of this impalpable mixture of gases was a hundred and sixty-five

degrees below zero, Castle remarked that the light within the gondola seemed to be increasing in strength.

It was now quite dark outside, and the Sun's brilliant radiance entered our nine-foot sphere through but two of our ten ports. Our two electric lights, battery-powered, had been burning since the twelve-mile height, that we might have light enough for logging observations. Now Castle reached out and switched off the lights.

Heavy dusk instantly shadowed our sphere, a semidarkness in which the beams from the two ports on the sunward side cut white bands, and Castle's face appeared as a dimmed blur above them. But as my eyes became accustomed to the light, I thought that I did indeed perceive a faint radiance, silveryish green in tone, pervading our tiny gondola, and seeming to emanate from the ports on the Sunless side.

"What can it be?" Castle wondered, as we stepped in that direction, to peer out into the darkness and see a remarkable and inexplicable phenomena.

From the dark and limitless heights above our rising balloon a shaft of pale radiance was descending, appearing without apparent cause from above, and sweeping down past us toward the world beneath, vanishing like some vast searchlight—a tenuous pillar whose width we could not estimate, and on whose edge we, in our drifting balloon, appeared to be.

"What the devil is that?" asked Castle.

For a while we stared in silence at that enigmatical radiance, until its intensity became equal in all directions, indicating that our uncontrollable balloon had drifted far into the heart of the thing. Then I thought to glance at the variometer, and was amazed to find that our rate of ascent, which had been tapering off, had leaped to thirty feet per second.

Castle glanced at the barometer. "The pressure, Miles!" he cried. "It's zero!"

ZERO PRESSURE and unexpected rise indicated only one assumption. I made it. "We're in an updraft," I said. "And there are no convection currents in the stratosphere."

I was conscious of a sudden silence. The radio, which had kept us in constant communication with the ground below, had quieted suddenly.

I stepped over to the receiver and adjusted for volume. At peak current a faint washing sound, like distant surf on a hollow shore, was audible; nothing more. "Hear that? That's interference! Try the transmitter. See if you can get them on code."

Castle knew code; I didn't. While he hammered out a brief message requesting the ground to increase their signal strength, I explored the short band on which the receiver operated. But always the steady wash of interference blocked all signals, and we could not know if the transmitter was getting through.

I think we tried for about an hour, during which the variometer showed that our ascent, instead of falling off, was accelerating. Soon we were flashing upward at over a hundred feet per second. Either we were riding an updraft whose force was greater than that ever known in the heart of a thunderstorm, or we were in the grip of something entirely unprecedented.

Once, between intervals of working at the radio, Castle's grave eyes met mine. "At this rate, Miles," he said, "we'll soon be on the edge of space, and the air's going with us. I expected the bag to blow open some time ago, but as long as the air's around it we're all right. What do you make of it?"

"I hope the world won't miss the air," I said, staring out at the encompassing

greenish radiance. "We'll soon have to open the appendix again."

I took our telescope and examined the four thermometers attached inside the lower part of the bag, and visible through the eight foot opening of the appendix. The temperature of the hydrogen was ninety-five degrees above zero; that of the highly-rarified atmosphere outside was a hundred and seventy below, and our bag was now an enormous, complete sphere. Hurried computation showed that our bag would soon burst, and the appendix was opened wider.

Castle looked at the variometer and examined the log; he figured rapidly. "Nearly forty-three miles," he said to me, "and still rising. Do you think we should rip?"

I didn't—then. Ripping meant that the gondola would fall like a stone; we would have to jump with the parachutes, and all our equipment, our scientific records, would be lost. I said that it was impossible that our enigmatic ascent should continue.

Castle agreed, and for some time he continued to work on the radio, and I to take observations. I found, on examining the sky with a small direct-vision spectroscope, that its spectrum consisted solely of a single green line, and decided that it originated from the greenish radiance which surrounded us. This line, I told Castle seemed to be similar to that characteristic of the spectrum of the aurora borealis, and was probably of the same origin—ionized oxygen.

"The atmosphere at this height is probably largely oxygen," said Castle, "but what can be ionizing it?"

"The aurora stops at sixty miles up, and we can't have reached that yet," I said. "Otherwise I would say that we were immersed in an auroral display. Ultra-violet will ionize any light gas, but it doesn't come heading in from

space like a searchlight. We have encountered either a stray shaft of solar radiator, or an electric field. Both explanations are unsatisfactory."

And so they were. They became impossible as our inexplicable flight continued. The variometer showed that our acceleration, instead of being constant, was increasing, and soon we were flashing upward at the unprecedented speed of four hundred feet per second. Yet to us the gondola seemed to be stationary in space.

FINALLY, at approximately ninety miles, when the greenish radiance seemed to be diminishing in intensity, we decided to rip. Castle and I heaved on the rip cord, brought in from the rip panel through a pressure valve in the wall. The result was utterly incredible: the bag did not collapse; we could see no change whatever in its prodigious, bellying mass. Our motion continued. Yet the telescope showed that the rip panel had been pulled completely away from the rest of the bag.

"What the devil's keeping the gas in?" asked Castle, staring at me in perplexity.

I was gazing through one of the ports. "Look!" I cried suddenly. "A meteor!"

"Where?"

"Up beyond the bulge of the bag. Looks like the half of a tiny moon. See it?"

We stared together at the small, illuminated crescent, which was slowly enlarging—a meteor, greatest danger in high-altitude ballooning. The green radiance faded, and we realized that we were truly beyond the greater part of Earth's atmosphere, at a probable height, such was our velocity, of more than a hundred miles. As the sky darkened the meteor grew in size, and we could clearly distinguish the rough, cracked details of the lighted part.

Distances were almost impossible to

gauge, since there were no objects for comparison, but when it was quite close to us it seemed as large as a house. We stared at it and waited; if our paths intersected we were dead men.

Considering our relative velocities, the meteor should have flashed past us with blinding speed; yet we watched it for minutes and finally were amazed to see that, relative to our speeding gondola, the lighted crescent had *stopped!*

"Good Lord," said I, when this was established, "it's following us. This is no updraft, Miles, this is a true force. It has us both, and some air as well. What are we going to do?"

What was there to do? We could not take to the parachutes, for our bodies would instantly burst. We had ripped, without effect. We could only wait—

AND SO WE WAITED, in the cramped confines of our tiny gondola, and watched the Earth beneath flatten out, and details merge into one expanse. We could see from edge to edge of the North American continent, as the Earth opened out; we saw the mighty oceans which rim America, and as far north as Hudson Bay.

And as we rose above the world, moving up into the regions where the solar radiation struck our metal sphere unabsorbed by any protecting blanket of air, the temperature of the air within the gondola mounted to well over a hundred degrees, and the thin metal shell became too hot for the hand to touch. We gasped in the heat and confinement, finally finding some relief by lowering the air pressure.

Several more meteors appeared, and were trapped into the path of our ascent, until we moved up surrounded by a small retinue.

When it became clear that nothing we could do would avail in stopping our flight from the world—for it was nothing else—enough of the scientific spirit returned to enable us to continue ob-

servations, for this was an unparalleled opportunity. Our greatest peril was that we might die of thirst, and, less imminent, of hunger. We had little to fear from the heat, beyond discomfort, for the gondola had been painted white with small equidistant black spots, to reflect most of the radiation we had expected at the higher altitudes.

Hours went by in which the Earth shrank from an expanse of continent and ocean to a mighty sphere of green and brown, with silver seas, on which the land masses could be easily discerned, interrupted in places by whitish cloud formations. Soon the sphere began to rotate visibly. Spinning, it shrank and dwindled; our speed must have mounted to incredible heights.

We were then far into the space beyond the atmosphere of Earth. The Sun was a searing disk, impossible to gaze upon, and the dimensionless points of brilliant light that were the stars were visible close to it, and in every direction.

Castle put his hand on my arm, as he stared through a port. "Look," he said.

I followed his gaze. Beyond the great curve of our swollen bag another sphere was partially visible, a brilliant half disk whose surface was shadowed and broken by cracks, pits, and ragged streaks.

"It is the Moon," I whispered, staring at Earth's satellite, enlarged to four times its normal size. I picked up a pair of calipers and measured its apparent size against the glass of the port; and made a brief calculation. "Sixty thousand miles distant," I said, slowly. "Good Lord, John, are we heading for the Moon?"

He glanced at his wrist watch; we had no chronometer. "Almost ten hours since we passed peak altitude. At our present speed we can't miss it."

I stared at him. "But the whole thing is mad!" I said. "It's quite impossible for a free object to leave Earth without a speed exceeding the velocity of escape.

Normally, we could never reach that speed."

Castle nodded. "There's an outside force at work, then. But what can it be?"

Our gondola flashed on through space, and the half disk of the Moon, visible beyond the bag, grew large. No rotation could be observed. The enormous, brilliant crescent, covered with the spreading dark areas called seas by the old selenographers, the great circular pits called craters, the wrinkles of huge mountain ranges, hung motionless in the darkness, undimmed by a trace of atmosphere. The shadows along the terminator were black and long.

OUR VELOCITY had been building up since leaving Earth; we were still accelerating. Castle and I both felt sick at heart, when we tried to imagine our present speed, and pictured the almost certain ending of the journey. The Earth had shrunk rapidly; now the Moon expanded with a rate a hundred fold greater.

Surrounded by our retinue of entrapped meteors, and with our huge bag still expanded to the limit, and still filled with hydrogen, our tiny, spherical gondola hurtled onward to the Moon.

Minutes passed; the globe became a spreading horizon. The horizon flattened to a plain, crater-strewn, bright with Sun. Directly before the bag appeared a circular, dark area, the mouth of a crater of unknown depth. Toward it we were hurtling.

It was then that we perceived, for the first time, yet another enigma. We were standing, as we had been during all the journey, on the flat floor of the gondola; we were peering through the roof ports at the nearing landscape. Yet, with reference to the Moon, the floor had become the roof. We were smashing on to the Moon upside down!

Some force was holding our bodies to the floor!

There was no time to consider the implications of this; our bag vanished into the crater; the gondola followed. We were plunged into unrelieved blackness, shrinking with horror at our fate.

I switched on our lights with trembling fingers, expecting that in a short second we would hit the bottom. My knees had no strength in them. Castle, little better, peered through a roof port. Managing to stare out of one of the wall ports, I caught a blurred flash of smooth rock walls, flashing past at unimaginable speed.

Incredibly enough, the seconds passed and still our fall continued.

Castle's lips trembled. He stammered, "Wh-what now?"

I worked my tongue and throat, but no words came. Normally more or less without fear, my mind then was paralyzed with terror. I collapsed on the floor, weak.

There was a sudden stinging in all my body, and instantly Castle and I, and all loose objects in the gondola, fell on the roof of the gondola, which had suddenly become the floor. My tongue came back suddenly.

"The force is gone!" I said. "From us, at any rate." I glanced hastily through a port, saw motionless walls. "Good Lord, John, we've stopped!"

But we hadn't, entirely; our velocity had fallen to a crawl, and we felt suddenly lighter.

Castle bent over the roof port, now the floor. "Sherrill!" he snapped, peering down. "Lights! What does this mean?"

I stared down. Far below, lights gleamed dimly in the darkness, illuminating faintly the bottom of the wide shaft; they had the appearance of being set into the walls. We could not see beyond them.

With deceptive speed, the gondola, above its dropping bag, fell toward the

lights, and as they approached we saw that they were indeed set into the walls above the smooth bottom of the shaft. Our progress seemed to be at an end. But when the bottom was but a few feet away, it suddenly slipped aside, vanishing into the walls.

Our gondola dropped into the gap, and we saw that what we had taken for the bottom was in reality a disk of some substance, dozens of feet thick, fitting into the shaft like a lock. Through five of these locks we fell, each opening smoothly at our approach.

"This is unbelievable," said Castle slowly. "Do you realize what it means?"

"It means that we have been brought here by some intelligence," I replied. "An intelligence which is still controlling us."

"It has brought us across a quarter million miles of empty space," said Castle, in a whisper. "It has brought us to the heart of the Moon. And for what?"

Past the fifth lock, our balloon entered a huge corridor, level, lighted by glowing panels in the smooth rock walls. The corridor was like a huge amphitheater, but it stretched endlessly forward. We sped along for miles, following the twists and branches of an amazing honeycombing in the heart of the Moon. At intervals we passed the dark mouths of inscrutable caverns, and wondered to what depths they extended, and what mysteries they contained.

COMING, finally, to an aperture in the corridor floor, our balloon dropped vertically through it, and we fell like a stone to the floor of a tremendous cavern. Brilliant light from an invisible source flooded the place, but walls and roof were lost in the distances. I peered through a port and saw the floor streaming away to an indistinct horizon.

We both looked for the bag. It hung above the gondola, and the wire shrouds were drawn taut; the bag was shrunken.

Instantly, our glances turned to the barometer, whose connections led outside. The glass indicated four hundred and five millimeters, a pressure found at sixteen thousand feet on Earth. There was an atmosphere outside. We determined that it contained oxygen in sufficient concentration to support combustion, at least, by ejecting a lighted ball of paper through the lower double valve. The ball burned steadily.

Castle opened a valve; a dense, damp fog instantly formed within the gondola, as the pressure fell off. When our inside barometer indicated four hundred millimeters, we opened the hatches.

"There's a strange odor," I said, sniffing the thin air.

"What a place!" said Castle, at the other hatch, as he stared across the limitless floor. "Not a thing in sight anywhere. What——"

Amazement cut off his words; as we stood there in each hatch opening, an invisible force lifted our bodies clear of the gondola. Held rigidly in its grasp, we both felt our brains gripped by a peculiar electric tension; and for a moment we both experienced strange half visions, flashes of great caverns endlessly stretching within the moon, all crammed with silent titans of machinery; vast halls where pallid, dead creatures lay on hollowed blocks of metal; a tremendous, silent sea at the core of the Moon, glistening and still beneath dying rays of pale light.

The tension and images vanished, and a second later a voice of infinite sweetness and sadness spoke in English from the air: "My name in English is Ythan Yth, and it was I who generated and controlled the forces which have brought you two across space from the planet you call Earth to this satellite you call the Moon. I have brought you here to Earth because I am dying; there is a thing that I must do before my hour is gone, before I give myself to the burial halls. I bid you welcome to a

dying satellite; for I am the last of my race."

The silver voice roughened slightly; the smooth flow of words was interrupted.

Then it murmured on: "It may be that my death is closer than I think. Should I be compelled to leave you before my purpose is achieved you would be trapped within this cavern; that must not be. I have determined that before I die I shall fall into a coma, from which I may or may not awaken. Should I become unconscious prematurely, an electric field, similar to that which pulled you across space, will come into position automatically about your bodies, suspending all living processes. Should I die without emerging from the coma, this field will be cut off, and the forces which brought you here will be reversed; you will then return."

THE VOICE PAUSED. Again we were held incapable of movement, while that peculiar electric tension seized our brains; like a prod of energy it pulled and tugged at our thoughts, and we were conscious of subtle alterations in our powers of reasoning.

The voice from the air was like waves whispering on a dark shore: "It is necessary to transform your brains somewhat; do not be anxious, they will be simply more efficient. Unfortunately, I cannot hasten the process; it is fixed by natural law."

There was a pause. The voice was shaken slightly by emotion: "How we of Echt have fallen! Once we were as many as the stars in the dark sky! I alone am left. When the inhabitants of the fourth satellite of the fourth planet smashed our world with atomic flares, millenniums ago, leaving mighty craters where cities had been, blasting our ever-thin atmosphere out into space, we suffered a blow from which we never recovered. The enemy were crippled

also, it is true; that is always the end of war. But they were the invaders; they did not suffer as we, who were unprotected and unprepared.

"They did not suffer greatly then. But later, after a thousand years, when we sent our absorption fields across four hundred million miles of space, their world became their heatless tomb. But that thousand-year effort left us wasted as at the end of many wars; we declined, rent by revolution. Of all my race, only I am left; the other died five thousand years ago.

"Only I am left to carry on that revolution-born tradition—that knowledge must go on. Only that tradition kept our race from utter extinction, in the dark years when we fought our brothers. Knowledge must always go on."

The tension left our brains and bodies; we could speak. Castle spoke aloud, "Why have you brought us here?"

The voice, fainter yet silver-clear, whispered: "I am going to give you all my knowledge."

This light seemed to fade slowly from that titanic cavern, shadowing into twilight. A great lassitude numbed our bodies; our thoughts, now crystal-clear and orderly, solidified in our brains. Our knees weakened, and we collapsed together on the floor, like two marionettes, while the twilight deepened into night. Then the light went out altogether, and we rode out on the ebb of a great and darkening sea.

From that strange state of suspended animation we awakened simultaneously, with no conception of the length of the intervening time, got to chilled feet, and stared at each other.

I looked about the cavern. "The light seems weaker."

We glanced up at the bag; it had shrunk to half its size. While we had slept, after Ythan Yth fell into his pre-death coma, the hydrogen molecules had

leaked through the rubberized cotton of the balloon fabric.

"Now the question is," said Castle, "has he died without coming out of the coma, or does he still live?"

Without speaking, we both stepped within the gondola, fastening down one of the two hatches. If the forces were reversed, we did not want to be sent back through hot space unprotected.

As we stood there waiting, the silver voice of Ythan Yth repeated faintly: "I am going to give you all my knowledge."

HELD RIGID, we again experienced that peculiar connection which evoked semivisions; we saw again the central sea of the Moon, the burial halls, and other sights altogether strange, but this time we knew that our brains were linked with that of the last Selenite.

The connection abruptly came into full focus, steadied, and became a series of impressions. Pictures and images flickered in our brains as on a screen; and had we been capable of astonishment, we would have been stunned, as the flow of knowledge continued.

Time and space lost all mystery, and became linked into one vast conception, whose ramifications merged with and explained all physical phenomena. Against the background of the ultimate stuff and structure of the universe we saw and understood all that had ever happened.

We watched energy being born into the original chaos of night and void, explaining the mystery of the creation; out of the primal, homogeneous universe of energy, we saw swirls and knots come, vast seas of energy which coalesced into nebulæ, hardened into supergalaxies, galaxies, local star systems, and solar systems, and knew that in the universe this process was still going on, releasing in the form of losses that hardest-known form of energy, the cosmic rays.

We saw energy form into semifixed fields, saw these fields merge into larger field systems, and these into others, until after an infinite repetition of these combinations there appeared matter in its final form, known to Earthly scientists as the atom. And with understanding of its ultimate structure, came full insight into all manifestations and manipulations of matter, all chemical and physical processes.

The flashing images stopped after a time, but our minds continued to struggle with the tremendous sea of knowledge.

The voice of Ythan Yth, murmurous still but ever fainter, said: "You know as much as I; do not use the knowledge for evil. You must go now."

I was still puzzled by one thing. "Why haven't you let us see you?" I asked.

Faintly, the words came: "Because my form might have revolted you. Now you have no prejudices; now you shall see me, for an instant, as you leave." After a pause, the last Selenite murmured, with liquid sadness, "My hour is gone. Farewell."

And said nothing more.

As we stood there in the gondola, the whole balloon went flashing upward to the invisible roof. When the dome of rock was but a few hundred yards away the cavern lights dimmed and vanished, but not before we had seen a shaft appear in the roof, a round tunnel into which our balloon sped, and which continually receded from our rising bag. Nor did this seem surprising to us; we both understood the cylindrical field which cut the shaft, and the driving field which thrust the rock plug, hundreds of miles long, out of the bore, to emerge on the burning lunar surface.

As the shaft cut upward it intersected corridor after corridor, and it was in one of these that we caught our first sight of Ythan Yth.

Along the middle of this huge bore stretched an endless beam of green radiance; upright and rigid, Ythan Yth sped along on the beam, eyes closed beneath lashless lids. We might once have shuddered at the pallid, shrunken body, lined with a thousand cracks and wrinkles; the spider-spare arms, with seven-fingered hands and feet; the great swollen head; the general aspect of millennial age. We did not now.

We were only interested in the fact that the floating body, borne to the burial halls, seemed in that flash to be one fourth as tall as the corridor whose roof, we knew, was a hundred Earth feet from the floor. For some reason I thought of the Titans, of myth, who inhabited Earth before the creation of man.

THEN we switched on the lights and fastened down the other hatch. A minute later we emerged from the Moon.

And so we came back—came back to find ourselves in a position where our knowledge, lacking raw material to work on, is useless.

For Ythan Yth, his powers dimmed by approaching death, erred in his computations. Briefly, he sent us too far and too fast. When the driving field, generated thousands of miles behind on the Moon, at last vanished, Castle and I knew from certain novel observations—we lacked proper instruments—that we would never come sufficiently close to the Earth to let us use the parachutes. The drag of the Sun, added to our excess velocity, was pulling us out of the correct path.

Since we would always have the velocity of the Earth-Moon system, there was no danger of falling into the Sun; little better, we would never fall into the Earth.

And so we have fallen into the orbit in which we are now trapped, approx-

imately five hundred miles from the mother world that we can never reach, eternally spinning along on an elliptical path.

Unless we obtain food and water soon we shall die.

This is our message to the world. We have computed our orbit, using our new knowledge and now brilliant brains to compensate for the lack of efficient instruments; I am inclosing all data. We have invented, using the amazing powers of Ythan Yth's mathematical system, a theoretically perfect fuel for a reaction engine, to be used in a space-traversing machine; I am inclosing all details.

This is our plea to the world: that Earth build this machine and send an expedition to our rescue. We have knowledge that must not be lost.

And so I will finish this message, and seal it into a small model of the space ship referred to, which we have contrived from an empty oxygen cylinder, and parts of the cosmic ray counter. This model is equipped with a parachute—made from our shirts! Lacking proper substances, we are going to charge it with some of our precious oxygen, mixed with a small quantity of alcohol, distilled from some anti-freezing solution.

The reaction will be weak enough, but, we have computed, sufficiently powerful, since the rocket's mass is small, to break free of this orbit. Would that we could do the same with the gondola!

Let whoever finds this message, which we shall direct to the densely populated New York State, put it in the hands, if possible, of Stanton University, Stanton, Ohio.

That is all. As I wrote the above, John Castle looked gloomily at his pipe, which he cannot light because air must be saved, and said: "To have so much knowledge and be unable to use it! Tell them to hurry!"

Will you?

*Enormously stimulated
trees wrought mad de-
struction everywhere.*

Dynasty of the SMALL

by John Russell
Fearn

AS an independent chronicler of the astounding events following Dr. Haddon Blair's efforts to eliminate disease germs from the world, my name need not be mentioned. Suffice it that I have been a witness throughout the entire sequence of events, and it is because so many misinformed people to-day regard the otherwise benevolent and singularly irresponsible Blair as a world-wrecker, that I am trying, purely out of Christian spirit, to



absolve him from all taint of criminal inclination.

The business started, as such things do, in the simplest manner. Blair, bacteriological instructor at the Research College of Science, was wont to spend his leisure hours investigating the realms of disease, studying antitoxins and serums, poring over microscopes, examining the formation of cells, protoplasm, blood and whatnot. No form of bacilli escaped his tireless searching.

I have myself seen him work far into the night in the laboratory—a short, bald-headed man, thin-shouldered and nervously earnest, his dark eyes forever alternating between his beloved microscope and voluminous scrapbook of notes.

Most students believed he was eccentric; indeed, they were rarely so polite. What on earth did he hope to gain from such an exhaustive examination of bacilli, parasites and Protozoa? Nobody knew—until a celebrated day in November, 1937, when he published his remarkable monograph on the cause of all protozoic diseases.

He claimed that he could kill all diseases that had this multicellular organism as their base, and was quite confident that the unicellular bacteria would also soon come under his control. Disease, he assured the medical circles, was doomed. I read his monograph myself, but not being a bacteriologist I had some difficulty in understanding it; still, he certainly had the right and logical idea.

His method was to destroy—by a method which he rightly withheld from his monograph—the protoplasmic nucleus of Protozoa. This, it appeared, killed the cell itself. He went on to explain how the Protozoa created, in parasitic form, such virulent diseases as sleeping sickness, malaria, and so forth.

So much I gathered from his monograph; later, in due order, I learned his method of annihilation—but to that in its proper sequence. What mattered

at that time was that, much though I regret to state it, the medical profession—either from a sense of jealousy or because they knew Blair spoke truth and would thereby ultimately put them out of business—utterly ridiculed the conception and forced the brilliant, sensitive Blair to retire into his shell and continue his work in secret.

This state of affairs lasted for some weeks, until there arrived on the scene the bluff, nut-brown giant known throughout the world as Captain Barry Northern, big-game hunter, tropical explorer, and president of American Tropical Explorations, Inc.

Dr. Blair watched him with a quiet expectancy, as he was shown into his study in the college annex.

"I'm a man of few words, doctor," the captain began, seating himself at Blair's request. "Both my fellow directors and myself have read your recently published monograph on the absolute cure of all protozoic, tropical diseases. We believe that you really have the secret, and are willing to purchase it."

"Purchase it?" Blair shrugged and smiled whimsically. "My dear captain, my antitoxin, as we will call it, is not a patent medicine. It is the absolute solution of all diseases which have the protozoan as the basis. Most certainly it is not for sale."

"Forgive me if I sound rather commercial," the captain apologized, "but we really are prepared to purchase the formula for this—er—antitoxin from you. Just consider its enormous value to us! We lose many good men through tropical disease. We honestly believe in you, doctor, and be damned to what these petty doctors say! Why, you've found for tropical disease what Nietzsche found for ethics and Einstein for space!"

"Thank you," said Blair quietly, clasping his thin, nervous hands on the desk before him. "I'm glad to learn that somebody is at least interested. My

antitoxin is unique in that it is progressive in its action. Suppose I explain, then if you are still impressed we may negotiate further? I would much rather you knew the details, you know."

"But I do! Your monograph——"

"Ah, yes, the monograph! Well, it was a very technically arranged piece of work, hardly phrased to suit the requirements of so practical a body as Explorations, Inc. To put it more clearly, captain, we will take sleeping sickness as our example. In this case the victim is first bitten, probably by a tsetse fly, which hands on the parasitic Protozoa into the blood of the victim, and there develops the endoparasitic disease of sleeping-sickness.

"Now, Protozoa are, of course, more highly developed organisms than bacteria; they are multicellular and divide by fission. Two become four, four become eight—and so on. Bacteria, on the other hand, are unicellular and far more difficult to destroy from the scientific point of view. Protozoa, though, possessing such amazing powers of multiplication, soon get their victim down. The center of their cells is composed of protoplasm, a granular viscid substance, consisting of water to the extent of three quarters of its weight."

"Well?" Northern asked, listening intently.

"It is that protoplasmic nucleus that has so interested me, captain. Protoplasm in the germ world—indeed in any world—is life. Life to *another*. Life is all one grand parasitism. Everything lives on something else; lives on the protoplasm of the *other*. You understand?"

"Why surely! Bigger fleas have smaller fleas upon their backs to bite 'em! Of course, I understand! But go on, please."

"Well, I have been rather handicapped in my efforts by there being some six million cells in a drop of blood equal

to two pins' heads—but thanks to the ultrapowerful microscopes I have devised from the resources of this college I have managed to be successful. So far I have related only the externals of my discovery. If you would care to step into the adjoining laboratory I will give you a practical demonstration."

"Delighted!" The captain rose with alacrity to his feet, and followed the small savant from the study.

TEN MINUTES of adjustment with his specially designed microscopes, and the placing on the slide of a drop of blood from a near-by phial completed Blair's preliminaries. Then he motioned to the explorer to look.

Obedying, the captain focused the lenses and studied in silence a vision of blood crystals with a dark agglomeration of foreign substance to the extreme right of the illumined circle of vision.

"Living flagellate Protozoa known as trypanosomes of sleeping sickness, transmitted to blood by the bite of the tsetse fly," Blair explained sonorously. "Normally they would finally invade the cerebrospinal fluid. Now, just keep on watching, captain. There! Now what do you see?"

At the words another spot of foreign matter dropped into view, moved indolently for a space amidst the blood crystals, then gravitated as though by chemical affinity directly upon the trypanosomes. Within five seconds the trypanosomes had completely vanished!

"Say, that was terrific!" the explorer exclaimed enthusiastically, raising his eyes. "I never saw anything so swift in all my life. How did you do it?"

Blair smiled. "Explained in detail it would give away my secret," he replied quietly. "Still, I can outline what happened. In the bacteriological realms, captain, there exist, as any scientist will tell you, hundreds of unknown forms of life. For instance, the Protozoa, more

highly developed than the bacteria, are the deadly enemy of bacteria—both enemy and destroyer. I reasoned that there must therefore be something that would likewise be the relentless enemy of Protozoa, and yet harmless to everything else.

"At last I found it—a minute animalcule with a crawling movement which I myself created by the crossfertilization of lowly cells and amœba. Through long years I worked, until at last I created a creature that could exist only on the protoplasm contained with the cell nucleus of Protozoa.

"All cells are different, all protoplasm is different; there is a specialized type to everything in nature. So my amœbical baby, weaned on Protozoa protoplasm, always seeks the Protozoa when injected into the blood stream. Naturally my animalcule are capable of fission and multiply at an amazing speed. But you perceive, since it is only fatal to Protozoa, that the body as a whole is unharmed completely, my animalcule making no toxic effects whatever on the blood stream, and when there are no more Protozoa left to feed upon, my animalcule dies from starvation. The blood stream then resumes its normal condition. Instantaneous cure is the result."

"That's marvelous!" the captain muttered. "But, tell me—how did you manage to manufacture this microscopic life? I thought creation of life was impossible?"

"I didn't manufacture life, my friend. I took living cells, compounds of protoplasm, chromatin, plant chlorophyll, and so forth, and brought about a complex crossbreeding. That's all."

The little scientist paused and smiled reflectively. "Bacteria will be much more difficult, though. With their minute fungoid bases and insensibility to heat and cold extremes—"

"Quite so—but about this stuff of yours. Are you willing to sell it?"

"No, the formula is too valuable for

inexperienced hands. I have a better proposition, a compromise. I will make up a bottle of the substance, complete with instructions as to method of injection, etc. If any of you are taken ill on your forthcoming tropic exploration and prove my antitoxin to be all I claim for it, your company must vindicate me in the eyes of the world and medical profession."

"It's a deal!" Northern declared promptly, extending a vast hand. "And say, why can't we inject before the disease and make doubly sure?"

"Where would be the use with no harmful Protozoa present? I grant that normal Protozoa would be there, bound to be—but why waste the substance on harmless organism? No, wait until you're attacked, then start."

"I see your point. Well, that's settled then. To make doubly sure of good faith you shall have confirmation in writing from my company."

"Thank you," Blair murmured. "I will see to it that you get the antitoxin within a week."

"A week! But we leave the day after to-morrow! I'm so sorry; I realize that it is rather short notice—"

"I cannot possibly do it under a week, captain. Still, that need not be a drawback, surely? You'll be going by train and boat, of course?"

"With our extensive equipment we shall have to."

"Excellent! I will send the antitoxin to you at—er— You're going to South Africa, I believe? Suppose we say Cape Town? I'll send it by fast air mail the moment I have it ready."

"Splendid, doctor! That will do admirably. We'll leave it at that, then, and to-morrow you will receive our signed warrant of good faith. Sign it and send it back to me by return of post; that will ensure my getting it before I leave."

"I will." Blair nodded. "Everything will be in order."

WITH the precision common to his quiet and industrious nature, Dr. Blair spent every spare moment in secretive manufacture of his extraordinary antitoxin. The written assurance of the bluff captain's promises duly arrived the following day, was signed by Blair, and returned.

The days moved on; the African expedition departed; but, true to his promise, a week later, Blair mailed his antitoxin by the fastest known South African air route, then proceeded to completely forget all about the matter and devote his attention to interrupted studies on the possible annihilation of bacteria.

From then on, it appears, our little scientific friend fades transiently from the scene of activity and instead attention must become focused upon a fast airplane heading for South Africa.

Malignant fate, in the form of a severe winter gale, swept in from the Atlantic and, according to report, struck the airplane when she was twenty miles west of Cape Verde Islands. There appears to be no exact record of what happened, but it is certain that the machine was finally brought down in the storm's fury and sank without a single survivor. Passengers, pilot, mails and shattered plane all sank to the bottom of the tempest-lashed Atlantic. For days afterward planes conducted an exhaustive search, but finally could only add the disaster to the already grimly long list of those gone before.

Dr. Blair, back in New York, constantly absorbed in his work, never read any newspapers and certainly did not listen to the radio, hence he was quite in ignorance of the occurrence. Indeed, even if he had known, it is doubtful if he could have foreseen the terrible things that were to accrue from the plane wreck. So it was that, several days

afterward, to his mystified astonishment, Blair received a cable from Cape Town:

NO ANTITOXIN TO HAND
STOP UNDERSTAND PLANE WAS
WRECKED IN GALE STOP SEND
FRESH SUPPLY STOP WILL DELAY
TRIP INTO INTERIOR FOR
FOURTEEN DAYS

BARRY NORTHERN

"Wrecked?" Blair repeated to his breakfast egg, and on asking his housekeeper for verification quickly received it.

"Why, yes, sir—the South African express went down in that awful storm we had about a fortnight ago. Surely you remember, doctor?"

"I do seem to remember that my hat blew off one day," Blair mused. "That must have been it. Dear me, how annoying. Incidentally, Mrs. Mason, these eggs are underdone. Four minutes is the time."

"I'll remember, sir. Sorry, sir."

Blair turned back to his eating. Silently, he resolved that fresh antitoxin should arrive in Cape Town within another week. Odd how calmly he came to this decision and yet had not the cold-blooded prescience to realize what might be happening to the other antitoxin at the bottom of the ocean. Whilst he sat detachedly eating his overboiled eggs and studying a treatise on germ cultures; whilst Captain Northern fumed impatiently in the torrid heat of Cape Town, a brine-sodden package in the depths of the Atlantic Ocean burst asunder and released into those murky, silent abysses the incipient decay of all civilization.

II.

THE second package of antitoxin reached Cape Town. Captain Northern returned from his expedition eight months later at the close of a scorching July. It appeared that he had had the most successful expedition ever—not a man ill. Fresh territory in the name of

the United States had been claimed, and above all things Dr. Blair's Protozoa annihilator was publicly acclaimed in the eyes of the world—to the intense irritation of the medical faculty and the extreme joy of those suffering from diseases which were definitely protozoic in basis.

Dr. Blair—Captain Northern now his closest friend—achieved world fame. Beyond the fact that his work had been recognized he seemed quite unconcerned, still pursuing his efforts in bacteriology. At his disposal had been placed a fully-equipped laboratory, backed by Explorations, Inc. The control of Cures, Inc., too, where the antitoxin was constantly manufactured by public demand for hospitals and medical circles absorbed a good deal of time.

Yes, throughout the following August events were steady in arrival, but quite unexciting. There were the usual undercurrents of war talk, Eastern menace, unemployment, and kindred subjects, until in the waning warmth of September, 1938, came the first hint of the unusual.

Probably nobody at that time attached the slightest significance to the almost obscure newspaper announcement that undoubtedly was the first authentic report of approaching trouble. Now, in the light of later events, I can trace it all back to that report, and here I reproduce it exactly as it appeared in the *New York Clarion* for September 28, 1938:

Pernambuco, Brazil.

September 27, 1938.

Our South American correspondent sets on record perhaps the queerest "Act of God" legal case in Brazilian history, taking place now in the Pernambuco law courts. Señor D'Alvarez, former proprietor of the Hotel Catalan on the coast of Pernambuco, which commands one of the world's most unique views of the ocean from every window, is endeavoring to sue the authorities of Pernambuco for causing, presumably by pollution, the blackness of the sea on the coast line.

The Hotel Catalan's greatest attraction is its view of the luminous sea breakers of the South Atlantic after nightfall. The phosphorescent glitter of waves in the dark must be familiar to almost everybody; on the Pernambuco coast, the effect, up to a month ago, was such as this, but far more brilliant than most other places in the world. The darkness of the sea now has caused Señor D'Alvarez to lose nearly all his extensive clientele. Case proceeding.

That, verbatim, was the case—and later it was reported that the unfortunate Señor D'Alvarez lost it! The authorities had certainly not polluted the sea, or caused the odd sliminess on the beach in front of the hotel. Poor D'Alvarez was further confounded in his efforts by the surprising evidence that not only the shores of Pernambuco, but also those of Natal, Bahia, Victoria and Rio de Janeiro were affected as well. From then onward there was a gradual smattering of increasingly puzzling reports that still did not convey anything save a very deep enigma to the scientific brains of the world.

Beyond that, though, the seas at night were utterly and absolutely dark. From California, Florida, England and Bombay came definite assurance of the fact, whilst seagoing men, many amongst them being famous, hard-headed captains, declared that the seven seas of the world, at night, were inky black. Always, they explained, the sea possessed a faint and hazy light, but now that had gone for the first time in history.

Solemn, Stygian water passed beneath the liners of the earth; sullen, unrelieved black breakers thundered on the shores of five continents. Luminosity had gone from the sea—and nobody knew why—then.

THE minister of agriculture for Great Britain in June of 1929, was gravely troubled. His gaunt, austere form, framed in the summer sunlight of the

window, was rigid in the intensity of his concentration upon a report in his hand.

"Incredible!" he breathed at last. "It utterly defies my comprehension!"

Quietly he turned and summoned his secretary.

"Benson, did you prepare this report?" he asked steadily.

Benson nodded. "Yes, sir. I am aware that it is extraordinary, but it is based entirely on authentic reports from the farmers and agriculturists throughout the country."

The minister's gray eyes narrowed. "Authentic, Benson? What sort of fools are they that dare to say they have grown wheat stalks seven feet high, and roses larger than cabbages? The thing is unheard of! Preposterous!"

"Maybe so, sir, but I am given to understand that the power of the saltpeter has become enormously increased through some unknown agency. At present this period of gigantism seems to be confined to this country, but I have unconfirmed reports of similar occurrences in America."

"Saltpeter increase!" The minister frowned. "Most unusual! Has it been analyzed?"

"By our own chemists, sir. It seems that there is a vast increase in the bacteria which virtually create saltpeter. This, naturally, is the basis of wheat cultivation, and——"

"Quite so, but that doesn't explain the giant roses. It seems as though a wave of Gargantuanism is affecting the entire country. Even trees are not immune from it. They are growing to enormous proportions this year. You must have noticed?"

"Indeed, sir, I have. But I am still unable to explain——"

"Very well, thank you," the minister interrupted, in a tone of quiet dismissal. "I must look into this matter very carefully."

"Very good, sir."

AST-5

THE minister of agriculture did look into the matter, with a desperation born of genuine alarm. In his position of eminence all agricultural bodies looked to him for suggestions and advice, but the problem was quite beyond the understanding of this matter-of-fact man. Not that he was alone in his perplexity, for the same startling conditions manifested themselves also in the United States, Canada, and Africa, spreading afterward to South America.

The wheat markets of the world were completely glutted with monstrous crops. In many instances burning was adopted, but without much success. The surplus still remained. Somewhere, deep down in the earth, had come a change—a terrific, amazing stimulation was at the base of all plant life.

Growth, formerly an orderly and unostentatious process, had suddenly become a wild and haphazard expansion in the midst of which man moved with a gnawing, deadening conviction of futility. To the average man, the panic of the stock markets apart, it was distinctly unsavory shock to find his favorite oak tree bursting all former bounds and thrusting into the earth roots of tremendous and devastating power.

Accidents became more numerous; walls were smashing down beneath this enormous force. Solid flags of concrete were smashed and broken to expose eager, hungry branches seeking the sun.

Vast crop yields, enormous elongation of the verdure of tropical countries—a change in the soil. Mighty flowers that mocked in their very vastness; the birth of a second yield before the first had hardly been cleared away. The canker of incredible growth was the sole focus of talk. In two short months it became a very far cry from a worried British minister of agriculture. The matter was one of world concern.

Botanists of every country examined the problem with a fevered efficiency, but only reached conclusions that were sin-

gularly startling. A condition of excessive osmosis was appearing, the process by which plants normally convey moisture from the ground against gravity to the top of their stems.

These erudite experts instanced a plant in Java which is used for practical purposes as a fountain. The stem is cut at several feet off the ground, and from the severed pipe pours a continuous jet of pure water, refined by the plant's own natural laboratory. This, they explained, was normal osmosis, but in the prevailing conditions of giantism this effect, visible in a mild formation in any growing plant, was now increased ten-thousandfold.

The ground was being sucked dry! Vast and plentiful yields would be inevitably followed by the world's worst drought. Even rain made no difference, for as fast as it fell to earth the plants utilized it and grew all the stronger thereby. A threat of the extinction of the human race gradually took grave form and portent.

SUCH MATTERS of paramount concern could hardly fail to reach so industrious a body as the Explorations, Inc., yet even so they had no inkling of the real truth. Captain Northern was puzzled, and rightly so; Dr. Blair was interested—but nothing more than that. Probably the matter would have continued to evade their real attention had not grave and deadly disease reared its ugly head amongst the masses and demanded of Cures, Inc., a possible relief from its fatal ravages.

"Disease?" repeated Blair, facing the newly established controller of health for the United States. "It depends on what sort of disease it is. We can stop all protozoic disease, of course, but——"

"Doctor—listen!" Michael Grant's cadaverous face was deadly earnest as he spoke. Here was no normal, pleasing controller, but a man harried by relentless trouble, the entire onus of sav-

ing a stricken country reposing on his bowed shoulders. "Dr. Blair, in Heaven's name, you've got to invent *something!* I've seen the—the most horrible things! The ravages of the disease pale the Bubonic Plague into insignificance! People are dying by the hundreds, especially here and in England. Hospitals are crammed to the doors; there are not enough doctors and nurses to go round. People with the disease seem to choke, strangle to death—then, horribly enough, they burst asunder as though blown up with gas! It's as though some dreadful after-death hypertrophy or elephantiasis sets in. It's—it's ghastly!"

"Terrible," agreed Captain Northern, who was also present. "But after all, Grant, we cannot undertake to——"

"Wait!" Blair interrupted suddenly, thinking. "I'm just getting the dim glimmerings of an idea. Tell me, Grant, have these people with the disease eaten any of the hypertrophied wheat, in bread form?"

"Why, yes. What else could they do?"

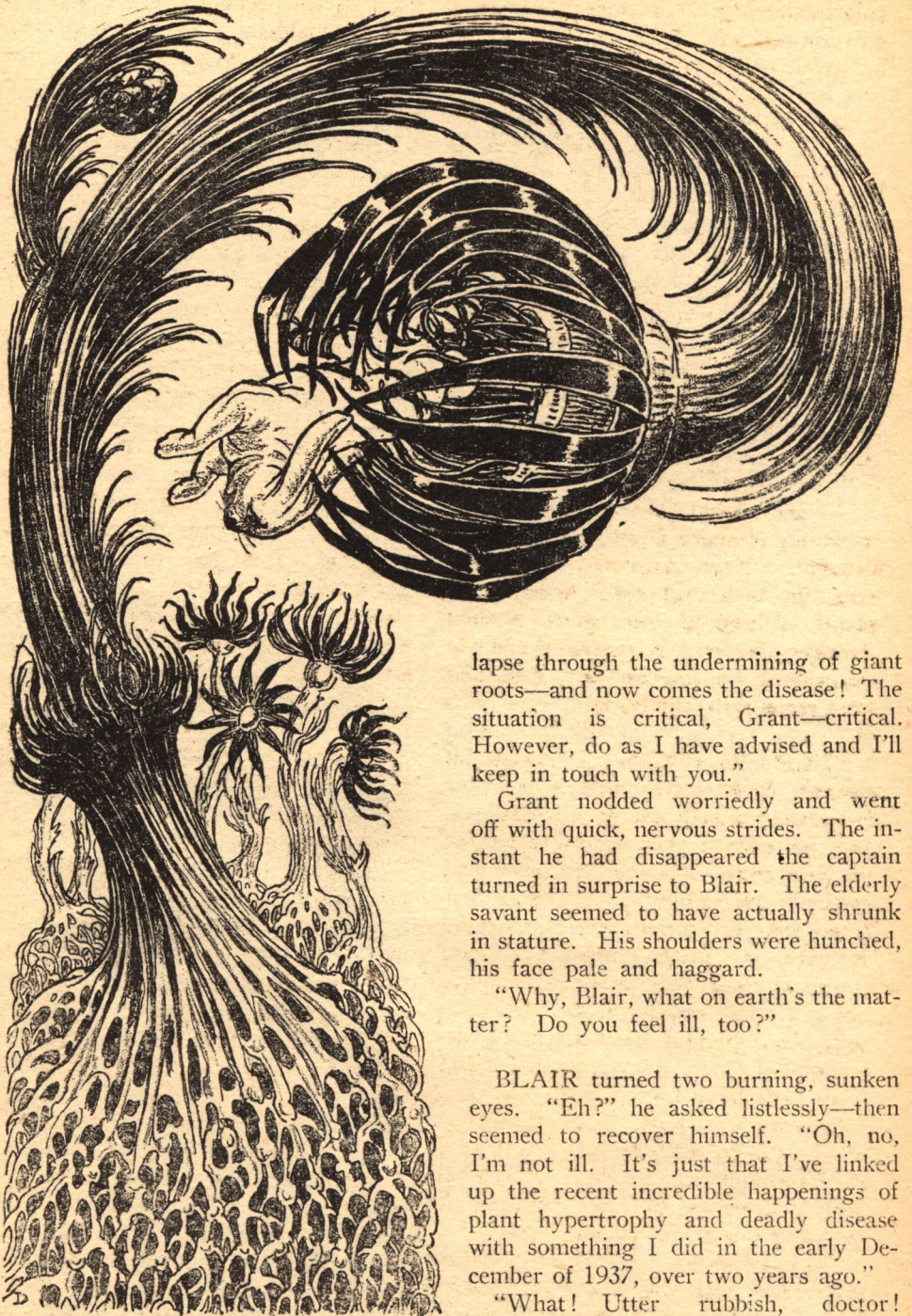
"In the circumstances, nothing else, but I just wanted to verify the point. I can give you no actual assurance, but we'll do our best to help."

"Ah! You have a clue for a cure?" the controller asked hopefully.

"I have a clue as to the cause," Blair corrected quietly. "I will telephone you the instant I find anything effective—if I do! In the interval, get every well-known bacteriologist to work on the problem. Get them to analyze the wheat, the trees, the flowers, the soil. It is not a botanical problem, but a bacteriological one. Murcatz of Austria, Professor Libby of England—get all of them busy and have them send their reports to me. If we don't work fast——"

"Well?" Grant questioned gravely.

"If we don't work fast I'm afraid I foresee the destruction of all humanity, and of all civilization. Already many of our buildings are in danger of col-



The tentacled disk bent forward in sudden fury; the unfortunate rabbit was torn in pieces.

lapse through the undermining of giant roots—and now comes the disease! The situation is critical, Grant—critical. However, do as I have advised and I'll keep in touch with you."

Grant nodded worriedly and went off with quick, nervous strides. The instant he had disappeared the captain turned in surprise to Blair. The elderly savant seemed to have actually shrunk in stature. His shoulders were hunched, his face pale and haggard.

"Why, Blair, what on earth's the matter? Do you feel ill, too?"

BLAIR turned two burning, sunken eyes. "Eh?" he asked listlessly—then seemed to recover himself. "Oh, no, I'm not ill. It's just that I've linked up the recent incredible happenings of plant hypertrophy and deadly disease with something I did in the early December of 1937, over two years ago."

"What! Utter rubbish, doctor! Something you did!"

"Yes," Blair groaned, shrugging hopelessly. "You remember that antitoxin

I sent you by air mail which went down in the Atlantic?"

"Why, of course, but what——"

"Lord! What a blind fool I've been, wrapped up in my petty experiments—this pointless money making. That infernal animalcule of mine had never before been outside a laboratory—never been in contact with anything. Only direct from phial to syringe, and thence into the patient's blood. You know yourself how careful we have been in supplying the stuff to hospitals, to make sure it doesn't contact anything but human blood? You know the rigid adherence to our instructions which is observed everywhere?"

"Certainly. Well?"

"It never occurred to my stupid brain what would happen to the stuff in the Atlantic. Now I know! I can trace back every event. You remember when the seas went dark? Beyond doubt my animalcule escaped from the package and made an attack on the infinite swarms of Protozoa existing about them. You see, the animalcule, only kept alive in the first place by the fluid in which they move, would finally exhaust their supply, and the demand of hunger would drive them to expansion. They must find more food. Clearly then they burst their bonds and escaped into the sea.

"Naturally, they found food unlimited and began their fission process. Two, four, eight, sixteen—— In the course of twenty-four hours one descendant of my animalcule would have multiplied to over a million! In four days to one hundred and forty billions*."

"Good Lord!" Northern cried, his red face losing some of its color as the stunning probabilities began to smite him.

"It is scientific fact that the destruction of Protozoa would cause the dark seas, and those slimy beaches would be

my spawned animalcule continuing their devilish search for edible things."

"But—but do Protozoa exist everywhere?" Northern asked helplessly, and Blair gave a grim smile.

"Do they! Good heavens, man, they swarm in every sea, at every depth, in the icy seas of the polar regions, in the hot waters of the tropics; they teem in the soil, in the water we drink, in the food we eat!"

"Then—then——"

"You begin to see? In the retrospect we can see that those shores touching the Atlantic were the first to be affected. It spread afterward to the land. In the soil the Protozoa have always killed bacteria; now, though, the Protozoa have been annihilated by something stronger than themselves—my animalcule! That means that the bacteria have a free field and can use *all* their energies.

"That logically means that all soil, trees and plants have become inconceivably vast through the energy of unopposed bacteria. The enemy are missing, and so bacteria have the chance to develop—a chance they've never had since the beginning of time—until I started to meddle!"

"And the disease?"

"Surely it is obvious?" Blair snapped impatiently. "Enormously energetic bacteria in bread, for instance—quite unharmed by the heat of baking ovens; unharmed bacteria in every drink, in every scrap of food, are now pursuing their own deadly and mysterious course. The balance is destroyed; Protozoa have almost gone. And the bacteria are *growing!*

"That has never happened before because of the constant Protozoa war; but now humans are being choked and rent asunder; enormously stimulated trees are wrecking our cities; osmosis is sucking the land dry. Ultimately the bacteria will be large enough to view! But disease—ordinary disease, that is, formerly restrained by Protozoa—will now

* English billion—one million million. American billion, one thousand million. The English value is used here.

be rife, besides this strangling plague. We're in a horrible trap, Northern, and I don't know the way out!"

"But is it possible for bacteria to grow?"

"Of course, with all opposition removed. The spores of bacilli or bacteria are the most difficult things on earth to destroy. I have interfered in a most unforgivable, tragic manner. No organism lives unto itself, captain. Nature is a perfect unity, incredibly complicated, but everything plays some part in the economy of the whole.

"Just as each living organism represents a delicate balance of forces, so does nature; just as the forces within the organism are perpetually changing, necessitating continuous readjustments to maintain the essential equipoise, so in nature from day to day, year to year, æon to æon, organisms wax and wane and the balance of life is continually changing. But, destroy one iota of that balance, remove one tiny part of it, and outraged Nature takes her revenge—like this!"

"THEN that means that, in finding a new equipoise, the most terrific things may happen."

"Are happening!" Blair amended grimly. "Consider the position! We have left, apparently, bacteria and fungoid spores, perhaps the most indestructible forms of life. Bacteria, as you may know, can survive both the temperature of space and that of molten metals. How do you propose we fight *that*?"

"Damned if I know! I'm more used to killing big game. Really it's this universal illness that's worrying me. We've got to do something, Blair."

The little scientist grunted. "We can't, Northern. We're faced with the most unimaginable difficulties. Bacteria are *free*, man—absolutely free to develop. In that very fact lies our undoing."

"Can't you invent something to kill the bacteria, then?"

"I've been trying to for years, and I'm afraid it would take several more years to complete my work. I've hardly scratched the surface of the problem yet." Blair's voice was colorless; then, with unexpected savagery, "Oh, the idiocy of it all! What a fool I've been! I've torn life and civilization out by the roots! In killing one disease I've released another, infinitely more horrible and complex."

"But, Blair, *something*—"

"There is only one thing, Northern. We have no cure, but we can use preventives. Antiseptic suits, covering everybody from head to foot, may arrest the onslaught—special suits, which I shall design. All food and drink must be completely and scientifically sterilized, as near as possible, by a bureau which Congress itself shall appoint.

"There is nothing else that can be done. Every living soul must unite in fighting the menace. We can't stop its progress, but at least we can, I think, save those who so far have escaped. I'll get in touch with the President himself right now."

III.

DURING the history of his career, man has been confronted with many major catastrophes, from the Deluge to the black death, but certainly nothing so completely devastating as the free evolution of bacteria ever befell him before.

The efforts of Blair were at least successful in advising the countries of the world as to what had occurred. At first he became the target for numberless attacks, but later on those gifted with more common sense than the majority saw quite clearly that he had acted entirely unwittingly in the matter, and therefore turned to him for orders.

There came, inevitably, a tremendous shuffling of social and governmental or-

ders. The usual topics of a sadly depressed and war-threatened world were hastily shelved in order that plans might be matured to battle with the new and incredible enemy. To the vast majority the idea of emancipated bacteria conveyed no meaning, but they were willing, none the less, to act on the advice of the great scientists working in cooperation with Blair.

There grew up after weeks of arrangement specially built edifices devised with walls prepared to confound the invaders—walls which were saturated automatically with antiseptics of the most pungent kind known to science. Every scrap of provisions and water was sterilized completely—or as nearly as possible. Suits tested to withstand the ravages of all known bacterial germs were manufactured in the tens of thousands and supplied to the now numbered and indexed populations of every country.

And whilst all this proceeded, death walked through the countries of the world, in particular strangling the life blood of America and England, twin dominations of the earth. In that late fall of 1939 the disease claimed tens of thousands; it swept through New York in a merciless, terrible tide. Always there was the final bursting apart of the victim. The rotting dead could not be moved quickly enough; all efforts to make decent burial or cremation were useless.

Side by side with this unparalleled horror came the constant smashing and toppling of buildings as still-active roots tore their way to the light. Riven streets, shattered edifices, fermenting and rotted limbs and corpses were commonplace sights in those black and ruthless days. Yet the survivors still toiled on, protected by their antiseptic suits, and built the domains for the remaining inhabitants. Now and again work was ruined by the intrusion of roots, but on the whole success was achieved.

It was the late fall; overworked Na-

ture was slowing down her pace, but, as ever, living trees and plants continued to reënforce themselves within, awaiting the spring when they would again burst forth on the Gargantuan race.

And now there was real drought to be faced. What little rain had fallen during the summer had rapidly been absorbed by the plants' osmosis. Springs, ponds, lakes and rivers had ceased to be. The reservoirs were sucked dry, and in their stead reposed tall and invincible grasses that hurled defiance to the first cold winds of approaching winter.

By far did the dead outnumber the living. Only a few head of cattle were alive, and these were jealously guarded against the time when they might one day be of use again. Hence meat supply failed. Milk was at a premium and water was rare. The only method of securing it was by filterization of sea water; but so difficult was the task of distribution, and so hard pressed was everybody in the building of shelters, the matter was shamefully neglected. Still, enough was obtained to meagerly satisfy the survivors, whilst food consisted of biscuits and dried foods all made before the Gargantuanism had come. In no other way was the certainty of security from the ravages of the disease.

Thuswise, in November, 1939, mankind in every country retired to the shelters assigned to him, to await the development of circumstances, to study out what was to emerge from this vast and complex upheaval.

TO THE FOREFRONT in the study of the existing conditions there were naturally Dr. Blair, Captain Northern, the officials of Explorations, Inc., and several scientists of international repute, amongst whom in particular was Professor Libby the noted English bacteriologist, a tall, gray-haired acrimonious man of uncertain age, who possessed

a penchant for arguing every scientific detail, great or small.

Their particular shelter building, larger than average on account of the instruments and apparatus housed therein, stood to the left of the now deserted Cures, Inc., building, commanding a perfect view of a small park to the front, with a vision of sadly shattered New York beyond.

The metropolis was empty of people, but in the park at the base of the colossal trees, or half buried in rank grasses, lay the cadavers of those who had fallen. The disease had been arrested now, of that Blair was sure, but he shuddered when he thought of the unguessable trillions of unopposed bacteria multiplying and evolving outside, pursuing, he felt certain, some enigmatic and organized plan of their own.

Not that there was any absolute guarantee of nondevelopment of bacteria within the shelters, but certainly there was less chance of it than in the vast outer world where extinguishment was utterly impossible.

Throughout the winter there seemed to be little evidence of any change. Somehow man struggled through on his short rations, afraid to venture outside. Frost and snow came and went, absorbed into the ground by the silent, now ungrowing trees. But deep down in the earth roots grasped the moisture and pushed their way farther into man's domain. And deep down in the earth, too, were the first dim stirrings of an incredible evolution, a process quite invisible at that time to the anxious eyes of watching millions.

Bacteria were developing with incredible speed, multiplying and expanding, freed utterly from all restraining influence. Strange and wonderful thing, this cyclonic and progressive development of spheres, rods and intermediate shapes, born of the soil, the colossal trees, the dead and festering remains of luckless humans. It was a birth and

transformation sufficient surely to cause the late Louis Pasteur to turn in his grave.

That bacilli, the rodlike bacteria, could ever have developed to visual size would have seemed a laughable fantasy in the ordinary world—yet toward the February of 1940 that was exactly what met the eyes of a staggered world, and particularly the eyes of the scientists connected with Explorations, Inc.

Reproduction began to take form in the manner of lowly sexual activity! By degrees each offspring began to assume greater and stronger form, and began to obtrude from the barrenness of the winter soil, hard and dry on the surface but moist below; from the trunks of the mammoth trees grew magnificently delicate growths of an unusually feathery consistency, roots buried tenaciously into whatever gave them sustenance.

THESE THINGS, this astounding development of invisible life into beautiful and almost exotic vegetation, was an occurrence that caused Dr. Blair to gaze worriedly through the window, as he had gazed for so many long, tedious months.

"Incredible!" he muttered. "And yet so blatantly, irresistibly true! Northern, those things are alive! Thinking bacteria! There's no room for doubt."

The explorer gazed doubtfully; the other scientists grouped about him.

"That's putting it rather wildly, isn't it?" Northern asked. "Whoever heard of thinking plants?"

"They're not plants; they only resemble them. They are evolved minute organisms—bacilli. Look at this fellow here by the window! Those branches are the absolute equivalent of ganglionic neurons and synaptic resistances, similar to those existing in a human system. Of course, I do not expect we shall have any sure sign of intelligence until the flowers on these queer things open. You see the buds?"

"Umph," Northern grunted. "Looks

like a mixture of nasturtiums and spiræa to me."

"But tell me, Blair," remarked Professor Libby, gazing through the window, "how can you possibly believe in the evolution of bacteria into thinking creatures?"

"Why not?"

"Why not indeed! It's against all scientific reason, Blair. I'm surprised at a man of your sagacity entertaining such a theory."

"On the contrary, my dear professor, it's the *only* theory worth entertaining. Evolution being infinite in time and possibility, the war of the human race and higher mammals with the forces of disease was, before this happened, only in the very earliest stages—the greater battles were still to come. The spores of bacilli were, and still are, the most difficult forms of life to destroy.

"Such other forms of life, like man, mammals, birds, reptiles and insects, are doomed to perish from any given habitable planet, overcome in turn through long ages of warfare by the indomitable forces of disease. These germs, with their life force of indestructible grandeur, are destined millions of years in the future to develop on the earth into a race of beings more and more intelligent than man could ever be.

"Along with the gigantic prehistoric animals already extinct, all other species will have perished until these smallest and least subject to gravitation will alone survive and dominate the earth. Here we have that evolution taking place right before us, brought about solely by the disappearance of hampering, destructive Protozoa."

"I see," the professor muttered. "In that case what do you propose we do? I had thought a world-wide fire might be beneficial in destroying these things."

"And lose perhaps the greatest revelation of all time?" Blair asked in shocked alarm.

"I am thinking of ourselves. If these

things do turn out to be intelligent there is no telling what may happen. They may be deadly and hostile; indeed it seems to be the only conclusion permissible. Look how they create disease in humans!"

"Ah, yes, but not from a vicious sense, Libby. They had to live. Their exact reasons we may learn later. Personally, I see no reason to anticipate hostility. A high intelligence is rarely hostile, you know. According to recent radio reports everybody can last out a while longer, so why spoil the chance of seeing for ourselves?"

The professor shrugged his thin shoulders. "It's in the hands of the majority," he answered quietly.

IV.

UNTIL APRIL the astonishing transition of bacilli from their natural lowly form persisted. Everywhere, in every direction, throughout the length and breadth of the earth, there grew and advanced these remarkable but by no means unlovely creations. Radio reported their presence in cities, suburbs, outlying districts and rural areas—everywhere indeed that life could gain a hold.

In some cases climatic unsuitability caused a retardation, but on the whole the surface of the earth was covered by veritable eight-foot-high jungles of the stuff. They grew amidst the ruins of New York, leaving the broken buildings standing like islands, in mute testimony to the littleness of man.

In particular did the domain of the scientists of Explorations, Inc., stand isolated amidst these living enigmas. Day by day the baffled scientists looked out in dazed wonder, still unable to fully reconcile this mad metamorphosis of bacteriological evolution.

In May, 1940, the buds opened—and it seemed noteworthy that no other plant life budded at all. Trees and grass re-

mained with the cold, bare barrenness of winter. In many instances there were evidences that the struggling giants of the previous terrible summer were dying, not living. Even steadfast, towering oaks were shedding their bark and becoming leachy white. A subtle, deadly necrosis had seized the earth's natural beauty. The living bacilli had become parasites, feeding upon the very plants they had once assisted.

The world became beautiful again when the bacilli buds opened into flowers. They resembled in general formation the vast, homely faces of giant sunflowers, only that they were far and away more delicate and ethereal in constitution.

The petals themselves, on the outer edge, were absolutely black, which caused no little controversy amongst the botanists who had declared a dead black could not exist in the plant world, except without recourse to skilled grafting. This array of black-spiked petals was presented in vivid contrast to the salmon-pink tentacled disks, as the countless hundreds of majestic plants bent gently in the first winds of that unparalleled summer.

It was when the flowers had been open for two weeks, no matter what the vagaries of the weather, that Explorations, Inc., decided that there lay before them one of the most unusual exploration trips in their annals. They resolved, by mutual assent, to venture outside. If the plants were alive and possessed means of communication there was no means of determining the fact within the heavily proofed walls.

Outside, there seemed to be little danger, nor was there anything to suggest that the plants were carnivorous unless directly attacked. The liberation of a white rabbit from the building revealed that the plants ignored it completely until it started to make an investigatory nibble of a thick stem. Then a tentacled disk bent forward in sudden fury;

branches lashed savagely, and the unfortunate rodent was torn in pieces with merciless ferocity. Afterward the plant in question resumed its passive and erect position.

"Obviously we must not attack them," commented Blair, after he and the others had been rather horrified observers of this little episode. "Everything else seems safe. There is certainly no danger of disease now; germs have grown up. Come—we'll go outside. You, captain—and you, Professor Libby, and any of you other gentlemen who care to come along."

The others nodded silent assent. Captain Northern, more from experience than aught else, took a rifle from the wall rack and fingered it lovingly.

"I don't like these darned things," he confessed. "Give me lions or tigers—anything *natural*! A collection of infernal plants isn't my idea of game at all."

"Take your rifle if it consoles you, captain, but don't for Heaven's sake, fire without cause," Blair warned him grimly. "Now, gentlemen, let us be going."

Cautiously, the door bolts were slipped back and the little party of men filed rather uneasily into the jungle of eight-foot plants about them, looking curiously at the livid-green stems of the things, noting in silence the peculiar formation of roots.

"I say, do you *smell* anything?" Northern asked presently, pausing and sniffing strongly.

The others stopped. The air was suddenly and unaccountably heavy with the oddest and most indefinable of odors.

"Lord!" Northern breathed, swaying slightly in spite of himself. "The stuff's got the kick of a supercharged cocktail. What do you make of it, Blair?"

The little scientist stood perfectly still, his face crinkled in the oddest expression, as he sniffed and considered simultaneously.

"Don't you notice something besides the smell?" he asked at last, and his voice seemed to indicate that he was almost afraid of his own thoughts. "Don't you detect a kind of—of mental perturbation?"

"I've noticed it for some time," Professor Libby commented pensively. "It feels just as though these things were trying to communicate through *smell!* Of course the thing is idiotic!"

"I wonder if it is?" Blair muttered, looking about him. "After all, in what other way could a plant growth convey its thoughts? Of what use is a flower's perfume by itself? Think of the exotic, overpowering odor of acacia; the heavy and sickly smell of a hyacinth in a heated room; the rank, earthy reek of a full-blown chrysanthemum, so suggestive of the fall and death.

"I repeat—botanists have never found the reason for a plant's odor. Might it not be a very rudimentary form of thought-radiation, entirely misunderstood by our hopelessly undeveloped sense of smell—the least developed of all our senses?"

"I never looked at it quite like that before," Professor Libby confessed. "Now you mention it, I——" He stopped suddenly in obvious surprise. "The plant odor has changed!" he cried in astonishment. "You notice? It smells like—like coffee! Doesn't that rather confound your plant-odor theory, Blair?"

"Not at all; several of the rarer tropical plants change their perfume just as a chameleon changes its color."

The scientists ceased to wrangle, fell silent, baffled by the peculiarities with which they were surrounded; but of one fact they could be sure: the bacilli plants changed the exhalation of their perfume almost constantly. At every forward step they took, the explorers into this new and unexpected world became conscious of new and unsuspected uses for their olfactory nerves. They sensed, by

their very action of inhaling the multitudinous perfumes, a first dim effort at communication, which was either too feeble or else their brains were too dense to grasp it.

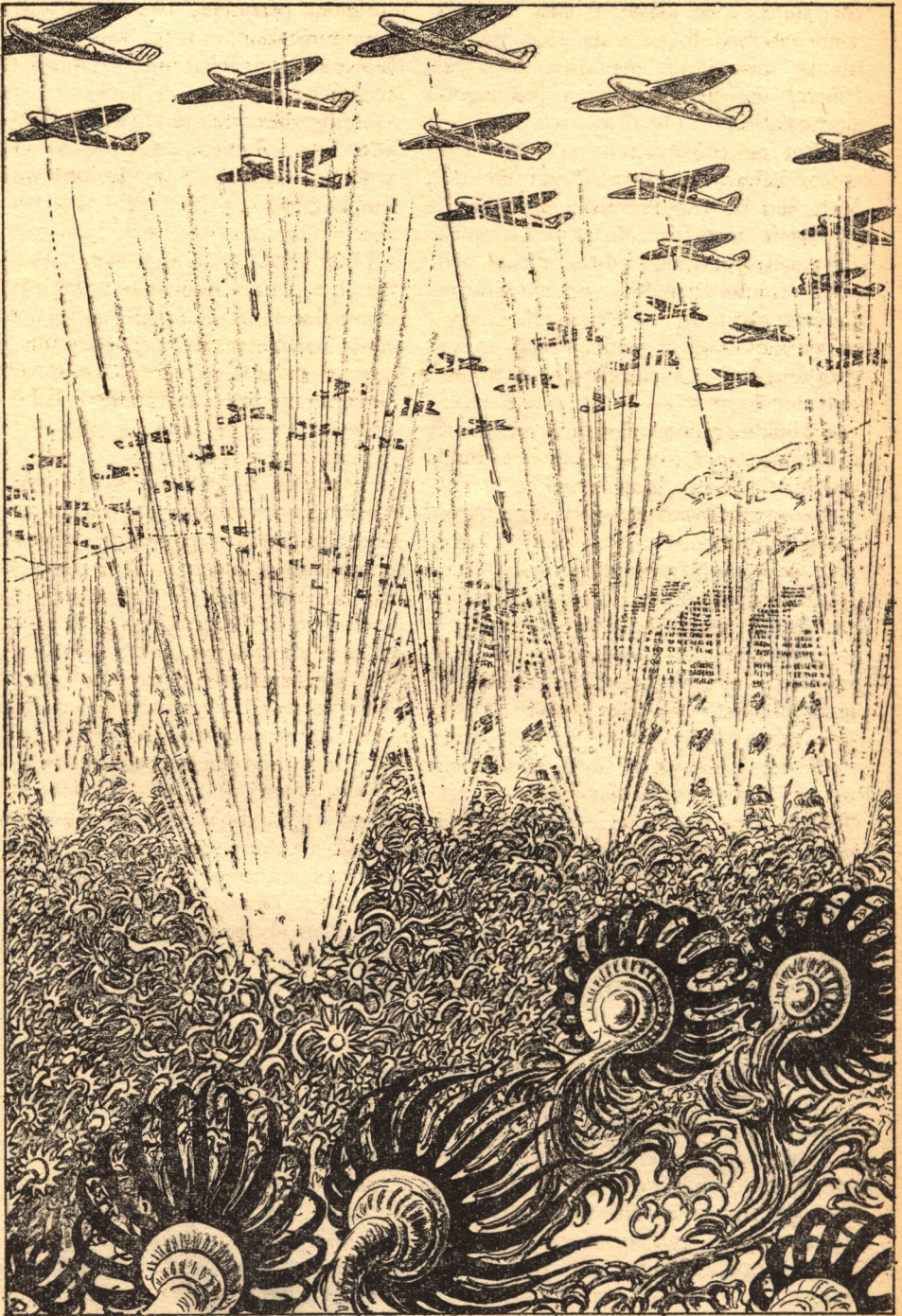
Altogether, that first exploration was none too illuminating. They learned nothing; indeed only realized with a numbing, leaden bitterness that the fair face of the normal earth had gone for all time—that they, in common with the countless other millions of earth's inhabitants, were a decadent race, prey to these odd but relentless objects that were neither plant nor animal, but something hovering on that strange, invisible bridge between.

IT IS SAID, with considerable truth, that familiarity breeds contempt. Certainly it did so in the case of the scientists in whom we are most interested. Day after day, becoming bolder each time, Blair led his little party of immediate followers into the surrounding bacteria jungle, and each day they became palpably conscious of a new meaning to the varied odors.

Their olfactory nerves became gradually adjusted to the unexpected conditions, with the result that a sense of smell, formerly the prime possession of animals, became a superb development in man! Nerve responded to nerve, affecting, too, the nerves of the brain, until at last, three months later, after constant inhalations of the perfume, those of Explorations, Inc., sensed the first real portents of dawning revelation entering their minds.

Instead of speech heard by the ears, it was odor conveyed by the nostrils, the formerly least developed sense in man suddenly taking on vital significance.

Thus in September of 1940 Dr. Blair and his associates perceived with perfect clarity the real meaning behind this incredible evolution. He and the others assembled in the little clearing



Airplanes rained death and destruction upon vast areas of glorious flowers—which only grew more profusely!

wherein they so far had daily investigated and, inhaling the laden air, read the first messages—beyond question the strangest messages ever conveyed in living men. The only drawback was the inability to convey replies. Answers could not even be given by pantomime, for it had become increasingly obvious that the objects had no visual organs. Their entire process of detection seemed to be accomplished by a complex form of sensitivity, as though their oddly-formed nerves were responsive to every change of light radiation, sound, or air movement.

Gradually the message took on form:

"That you are men, flesh-and-blood creations born originally of chromosomes, we know full well. We have sensed the aura of your presences, and to a great extent have gathered information from your minds. We would wish it to be understood that since our advent to maturity, the completion of our evolutive cycle, we have taken stock of the world into which we have come. To humans, as we sense you call yourselves, we have no hostility, and much less so to your particular party.

"You, Dr. Blair, are our greatest benefactor. By the removal of what you call Protozoa you took from our paths what would be to you the equivalent of three things—time, war, and death! With none of those to hamper you, think what you could do! You gave to us a similar opportunity, and for that we are grateful.

"That we have developed to maturity so quickly is not really so wonderful a thing as you seem to imagine. Before, our microscopic size, our almost two-dimensional limitations, caused our purposes and advancement to be invisible to your eyes. We had the same powers then as now, but you couldn't detect them.

"Our world was a flat and uninteresting place; we were surrounded by giants, almost beaten in our struggle to

attain full proportions by the ravages of the merciless Protozoa. Now that we have emerged from our cramping environment, now that we have, as it were, a totally different relative outlook—as different nearly as a new universe would be to you—we shall pursue our intelligent pursuits. . . ."

THE ODORS ceased for a space as though a plan of explanation were being formulated. Blair looked at his companions in silent wonder, there to find expressions similar to his own. Then the communication resumed.

"Even to your understanding, men, there are degrees of parasitism, and from being the most lowly parasitic organism of dimensions of one twenty-five-thousandth part of your inches, we have risen to our full grandeur. The degeneracy of a parasite, you will agree, is in proportion to its dependence. Thus you will see that there is little degeneracy in, for instance, the mosquito, which has to fly, bite and digest—but on the other hand the tapeworm has nothing to do but digest, and hence is degenerate.

"We never really possessed any real animosity for our hosts when we were parasitic. We merely tried to avail ourselves of an abundant source of energy, but in the course of doing so we were bound to excrete toxics and poisons which were in many cases obnoxious to our hosts—hence came disease. In particular was this manifest when our growth increase caused the bursting of human beings. Being present in blood, feeding and expanding simultaneously, there was no other course but actual bursting asunder of the victim.

"For those occurrences we are deeply regretful, but it was unavoidable. Disease has gone now from your world for all time—at least for so long as we exist, and our life span is of course thousands of years. Our food we draw from the soil, our sustenance from the air.

"Above all, understand this: We are

the rightful owners of earthly life. Of us you were originally born; without us you would never have been born. Nothing would have been born. Now our turn has come, and we are here to form a dynasty of our own. We shall not interfere, with you, but you would be well advised to attempt no hostility. You may move amongst us as you will, do what you wish—but leave us to our own devices as you value your lives.

"You cannot be expected to understand the nature of our science, a science which we have perfected through unguessable ages, long before man ever came on the earth. When the world was a steaming, fetid jungle of poisonous gases we were reaching the apogee of our intellectual evolution. That evolution we perfected when man made his first appearance on the earth, and since then we have steadily perfected our preconceived conclusions.

"Because of our infinite smallness by comparison with the rest of the world our science is mainly two-dimensional in essence. More we cannot convey to you at the moment, friends, but we rest assured our communication has interpreted itself into the language you understand. As time passes you will know more of us."

There the communication ended; the heavy and multifarious odors faded. The jungle became silent, problematical, bathed in the light of the slanting September sun. Quietly, puzzled, the scientists returned to their abode and there, for a while at least, stood in thought.

At length Blair spoke. His manner was calm and steady, as though he were a general facing a militant crisis.

"Gentlemen," he said slowly, "it becomes increasingly obvious that we are being usurped by a strange, new dynasty—a dynasty of the small. At first sight it seems that we humans would have no difficulty in enforcing our own rights, but a little reflection re-

veals the alarming fact that we are being overpowered by creatures utterly indestructible! Fire, chopping, acids, explosives—everything known to science—are useless! Bacilli can survive all those things, and even if they could not we have not enough available supplies on earth to be effective. You see, as fast as these infernal things are mown down they will grow again from the severed portions."

"Then what are we to do? Sit and take it?" demanded Northern aggressively. "I don't see taking orders from any damned plant, even if it does smell nice!"

"You propose we sit here and wait for something, like—like ultramodern Micawbers?" inquired Professor Libby acidly.

Blair shrugged. "If you have any suggestions I'd be only too glad to have them."

Nobody had, it appeared. For the time being the giant bacilli held the field, and mankind, for all his years of culture and brilliance, was at an utter loss.

V. .

INTEREST in the invaders on the part of the world's entire population changed suddenly to consternation four weeks later, when it suddenly became evident that the creatures, as they were commonly called, possessed the power of locomotion. In much the same manner as a spider uses its active legs, so these queer beings of an incredible world used their roots, pursuing a strange, creeping sideways movement. Only when they evidently felt the need of rest or nourishment did they pause and sink their roots back into the earth. But at least their marshaling into some semblance of order left many regions clear, including that about the Explorations, Inc., building.

Pursuing the bacilli through many weeks, Blair and his comrades found that the areas in and about New York had become entirely free. Similar reports came from other cities of the world. Everywhere, evidently working by some peculiar telepathic system of their own, the bacilli were moving to former farm and pasture land, where they could best obtain the particular ground stimulant they obviously needed.

But what a changed world they left behind them! In New York, as people began tentatively to reappear, it seemed as though some giant bomb had been dropped in the very center of the city. Those edifices which had survived the osmosis onslaught were cracked and fissured where the bacteria roots had found a temporary lodging. The streets were cracked and split, in some cases had subsided altogether. Windows in one piece were few and far between; street-car and railway metals were twisted and bent out of all normal semblance of shape.

In the country there was also disaster, of a different nature. All plant life was dead; bacilli were in complete dominion. Where wheat and barley should have been standing in that golden fall, where the leaves of trees should have been turning russet brown, there was only an area of infinite miles of mighty eight-foot plants, forever shifting and altering their positions, turning the air of the country and city alike heavy with their odors—and yet the odors were disguised and inconsistent, so that humans, rebuilding their shattered domains and finances, could not analyze what plans the interlopers were perfecting.

To reorganize the world affairs and repair the damage was not too gigantic a problem; indeed in eight months it was accomplished. But the May of 1941 brought the increasing realization that, whilst man was totally free from all traces of disease, he was faced with complete starvation! The reserve supplies

were almost at an end, and there was no means of replenishment.

Water, now that the osmosis of plants had ceased, was as plentiful as of yore, but the death of all plants had meant the death of nearly all cattle, of wheat, cereals, vegetables, fruits, the mainstays of life. Synthetic means could have been adopted had man been warned in time, but now there were no seeds either.

Finally, Congress, on June 1, 1941, issued the alarming report that, in America at least—and the position in other countries was, if anything, worse—all supplies would end by July 31st. By September humanity would be extinct!

A SUDDEN and tremendous wave of panic swept over the American people. Action was demanded—instant action. Accordingly, the helpless congressmen turned once again to science for assistance. Blair, Northern, Libby, all the members of Explorations, Inc.—who along with the world's greatest scientists had studied the problem ceaselessly in the intervening months—convened an extraordinary meeting to meet the emergency, a meeting which was filled to capacity with an eager and excited audience hours before it was due to start.

When, ultimately, it did begin, Blair could do little but outline at length the utter indestructibility of the bacilli plants. He delivered almost a complete lecture on the nature of cells, chromatin, and kindred subjects, explained how the bacilli were now living on the very nature of the ground and absorbing the now nearly dead life of trees and vegetable matter to nourish themselves.

"Unfortunately the plants are still on the increase," Blair went on worriedly. "Our figures show that they now populate every scrap of earth where a city or an ocean does not stand. Against such numbers we are powerless. How many of them there will be before they

put their unknown plans into operation we don't know—but we do know that there are too many of them to eliminate."

"Be damned to that for a tale!" snorted Caleb Roome, president of the National Food Trust, seated in the front row of the audience. "You call yourselves scientists, and instead of fighting the crisis of world starvation you stand there and prattle about how fast the plants are multiplying! Infernal rot, sir! We have airplanes, bombs, tanks, acids and gases—all the products of modern warfare. They've got to be used!"

"As you wish, Mr. Roome," Blair answered wearily. "It will be quite useless. Bacilli are the most adaptive of all living things. They carry within themselves organisms denied to humans. They are a complete filtering laboratory on their own; also they can synthesize; they can change the nature of anything to suit their own requirements. Poison gas they will convert to their own purpose." Blair paused, then thumped his fist heavily on the desk before him. "Mr. Roome, ladies and gentlemen, mankind is faced with an *indomitable* foe! In six months mankind will be a memory in cosmic history."

"Balderdash!" yelled Roome, g'aring. "Desperate ills need desperate remedies, and I for one refuse to believe that there is an enemy that cannot be destroyed! Those plants must *die*—and every scrap of modern warfare must be utilized for the purpose. I appeal to you, Senator Morgan, sitting up there in silence, to have Congress pass an act permitting immediate attack by the army, navy and air force. These infernal plants are not half so intelligent as we are; it's against all reason. I insist, senator, on behalf of all these people——"

Roome's insistent and bellicose voice was drowned out by the din of enthusiasm that suddenly burst forth. Through

the midst of it all Dr. Blair stood in almost pitying silence. Northern, standing beside him, was openly aggressive. Professor Libby, discreet being, chose the region of neutrality and sat with a saturnine, impassive face.

Senator Morgan rose up with all the pomp his office demanded. With that the noise subsided.

"Congress will, I'm sure, readily grant your request, Mr. Roome," he said quietly. "Indeed, we have only been waiting for the outcome of this meeting before coming to a decision. Obviously we cannot face starvation and death—and particularly at the hands of so-called intelligent plants"—the sneer in his voice was grimly obvious—"therefore we shall fight to the death. Not only our own resources, but those of every other country will be pressed into commission. England, Germany, Russia, China—every great nation shall unite to fight the common foe!"

FURTHER SPEECH was impossible. The cheering broke out afresh. It was mad and senseless cheering—the safety valve of a panic-stricken people. Any promise of succor from their dilemma was sufficient to precipitate the most extraordinary scenes. Stamping and shouting, the people began to disperse.

Blair watched them go with a sad light in his eyes; he shrugged his shoulders as Senator Morgan and the other members of the opposition stepped down to join them. The air hung heavy now with the odor of rank tobacco fumes. From afar came the sounds of insensate revelry taking place, evidently, in the heart of the city.

Blair turned at last to Northern, Libby, and his friends of Explorations, Inc.

"Well?" Northern asked grimly. "What do we do?"

"Nothing." Blair compressed his

lips with an air of finality. "Let them carry on their silly bombing and poison gas. It will avail them nothing. Doom stares us in the face. That story I told you about the evolution of disease germs has come true. We shall be extinct within two months, unless a miracle happens."

"You honestly mean then that there is no way out?" Libby insisted.

"I do. The only way would be to stop the bacilla plants getting air, cutting off their supplies of nitrogen, for instance. Then and then only would they die. But that plan is entirely beyond scientific bounds; we cannot interfere with the atmosphere in our present state of knowledge."

"To me, the whole thing seems to be a vicious circle," Libby commented pensively. "Even granting that we could ever destroy these damned bacteria and reduce them back to their normal state, we should be no better off without Protozoa. The same thing would happen all over again."

Blair shook his head grimly. "No, professor, there you are wrong. Do not forget that it was my cross-bred animalcule escaping into the Atlantic that caused the death of all Protozoa. Ultimately, when the last Protozoa had been destroyed—even in our very bodies—and that must have occurred long ago—my animalcule would begin to die from lack of specialized nourishment. Once that happened Protozoa would begin to return to the world; there would be bound to be some survivors from which the initial multiplication would take place. Reproducing at the rate they do they would soon equal the numbers in existence before my colossal blunder. But what use is it? The bacteria have evolved and Protozoa cannot hurt them now. No, mankind is finished. I had thought of many ends for humanity—but never this! Come, gentlemen—we had better be going."

VI.

WITHIN TWO WEEKS—the briefest war muster in history—incensed mankind embarked on the most fantastic battle of his existence. Every nation, suddenly realizing the uselessness of attacking his flesh-and-blood neighbor, lent his resources to the all-inclusive ranks. The mightiest numbers of airplanes, ships, shells, and war materials in earthly history was marshaled for the attack. Each country possessed its own divisional commander, and were all ruled over by Field Marshal Cranbourne, an American, recognized to be the world's foremost military genius, especially appointed by Congress for the purpose.

Yes, it was indeed a peculiar war. Airplanes rained death and destruction upon vast areas of glorious flowers, watched the lovely creations smash and break amidst the thundering débris of up-plowed earth. Machine guns rattled their staccato beating from strategic points, mowing down the moving plants by the hundreds. Shells from long-range guns were incessant.

Tanks lumbered through the confusion, backed by infantry and cavalry, armed, not with rifles, but with gigantic and deadly axes that would have done credit to any medieval high executioner! One singular outcome of this unorthodox war was the utilization of the armed mower—an ordinary wheat-threshing machine covered in armor plating. Actually, they proved far more useful than the tanks, sweeping down great areas of the bacilli giants everywhere they moved.

Those days did much to reveal the underlying strength and nobility of man when his life and heritage was threatened. He fought with the savage ferocity of the primordial, calling to his aid every known device of destruction that modern science could supply. He fought a grim battle with hunger, too; supplies were fast petering out. Strict rationing was enforced, in many cases

by no means adequate. Death was already claiming the first members of gallant humanity.

And through it all, to the hopelessness of the fighters and the intense chagrin of Marshal Cranbourne, came the knowledge that they were *losing*—hour by hour! How truly Blair had spoken when he had said the plants were indestructible! They were! As they were destroyed the broken sections resprouted in incredible multiplicity. Where two hundred plants were destroyed two thousand sprang up in their stead, casting their pungent and now defensive odors to the shell-ridden sky.

After a fortnight of this feverish battling Marshal Cranbourne called a halt. It was useless—all wasted effort. Reports revealed that the plants were far thicker than they had been before the war had started! Countless millions of them were now in every corner of the earth, jammed tightly together with hardly enough room for further expansion. And more were still coming—thousands, tens of thousands, sprouting from the shattered remnants of the old.

Finally, by special request of Congress, Marshal Cranbourne—along with Blair and the others—presented himself at a special meeting of crisis. There he made clear the position, convinced his hearers of the impossibility of success.

"You were right, Dr. Blair," was his concluding words. "We have at most no more than a month to live."

Blair smiled strangely as he rose to his feet. "Frankly, marshal, I'm afraid you are laboring under a big delusion—if you will pardon my saying so. You imagine you have lost the battle; I venture to aver that you have *won* it! By to-morrow morning, I am convinced, mankind will be freed from this bacteria invasion."

The field marshal smiled gratefully. "Your optimism is appreciated, doctor, but quite unfounded. Where there were formerly thousands of plants, there are

now absolute millions. Every scrap of available space is being used by them. They are infinitely thicker than the undergrowth of an African jungle."

"I know," Blair answered quietly "That is what I am counting on. Suppose—and I know this is an unusual request—we wait here until to-morrow morning? That is a matter of some twelve hours. I have taken the liberty of believing you will acquiesce and have instructed radio reports to be sent in from all countries as notable bacilli changes occur. What say you, gentlemen?"

"Well, we have nothing to lose by doing so," the chairman answered, "but what you hope to achieve is a mystery, doctor."

BLAIR SAID NOTHING to that—not even to Northern and Libby, who were persistent in their questioning. And so, gradually, the hours passed on in the great executive hall. Very meager refreshment was brought in at midnight, after which the majority of the men present began to doze from sheer boredom. Then, suddenly, they were shot into wakefulness, at one a. m., as a radio report came through from England.

"Listen, gentlemen!" Blair cried exultantly. "England reports that the bacilli are *dying*! Rapidly! Like plants before a blazing fire!"

"Impossible," said Professor Libby, and the others looked on skeptically. Gradually, however, other reports came through—all in the same strain. From Russia, China, the remoter parts of America itself, Germany, Africa—Everywhere the plants were wilting and collapsing! Hour after hour during that unparalleled crisis came those welcoming messages, until at last in the cold hours of before dawn an airplane pilot was admitted. It appeared Blair had specially commissioned him.

"The districts around New York are free, sir," he announced eagerly, his eyes glowing. "There's bare ground and some wilted remains of plants—that's all. Everywhere my searchlight touched I beheld the same thing."

Blair smiled triumphantly into the dazed eyes of those gathered about him.

"Gentlemen," he said quietly, "the bacteria menace has gone; the dynasty of the small has collapsed before its mission, whatever it was, could be achieved. Crops will grow again; there are bound to be some seeds left in the earth; trees will return to life. Those few cattle we saved can be released to carry on the work of reproduction. The seas will glow again at night; the earth will return slowly to normalcy. We have met and mastered the greatest scourge that ever threatened us, and, unwittingly, it was Caleb Roome's demand for war that saved us! The war itself delivered us, after all."

"Blair, what are you getting at?" demanded Marshal Cranbourne, his face strained and anxious. "Why have the plants died? It's all so inexplicable."

"On the contrary," Blair smiled. "You see, it never occurred to me until I heard the reports of the plants' multiplicity how the whole business was going to end. *Overpopulation* killed them!"

"But—how?" demanded Professor Libby.

"Just the essential equilibrium of nature. Any region of nature left to itself rapidly attains a state of equilibrium, a balance being reached and maintained between the various forms of life that inhabit it. Sometimes there are outbreaks of overmultiplication, but through disease, or maybe war, the bal-

ance is restored again. Take the monsters that inhabited our world millions of years ago. They banked on size and strength—so much so that finally they became too unwieldy to hunt their food, and as a consequence became extinct—or, more correctly, took on smaller forms through the process of evolution."

"Well?" the chairman asked quickly.

"Well, these bacteria plants, thanks to the terrific hammering we gave them, multiplied so fast that they had no room to take nourishment—probably, even, they could not get enough air. They exhausted their supplies utterly and died thereby. Jam humans closely together—as for instance the Black Hole of Calcutta—and death is inevitable. That is just what happened here. The plants died from lack of space, and the result is that that particular species of giant bacteria has gone forever. The normal type will resume—must be doing so even now; but since Protozoa are also present they will be kept in check as of yore. Yes, my dear friends, mankind is free."

"You're right," muttered Libby, glancing at the first rays of the morning sun through the window. "Man is born anew."

"Exactly." Blair nodded. "The people must be told. As for myself, I'm leaving now to perform a very important mission."

"It is?" Northern inquired.

"I'm through with trying to stop disease. Better to have disease than wholesale annihilation! I'm going back to our laboratory at once to destroy that formula for my animalcule."

Don't Miss:

The World Of Purple Light

by Warner Van Lorne

in the December Astounding Stories

Macklin's Little Friend

Nature tries all methods of reproduction

by H. W. Guernsey

THE old, substantial residences on Lincoln Avenue stood in blocks of secret, dark masses against the swiftly failing green pallor of the western sky. A fleet new coupé slowed, slipping forward close to the curb. After crossing the intersection of Mills Lane it stopped at the corner residence as silent as destiny. The powerful white beams of the headlights went off. Out of the car staggered the muscular, personable, but now nearly furtive figure of Willard Macklin.

Light from the corner lamp reached his face. His gray eyes were ablaze. Somewhat lean, and intense with years of determined study, his dark features were extraordinarily accented by his glistening paleness. He wore no hat. But the huge and perplexing turban of bandages surmounting his head seemed to be as great a burden as he could support.

Shakily mounting the steps like a drunken man, he paced laboriously up a red brick walk dividing panels of level green velvet lawn.

Above the doorbell in the brick wall, partially hidden by vines which swarmed over the house, a browned brass plate carried in modest relief the name of Theodore Kley, M.D. One year following Macklin's imminent marriage to lovely Barbara Kley, allowing that time for the honeymoon and their getting settled, old Kley meant to retire and Macklin would assume his moderate but rich practice. Macklin inclined the sickening weight of his head for a moment, then stumped the bell with his thumb.

After a moment old Theodore himself drew the door wide. A stocky, heavy-boned Dutchman, grizzled, he still had his penetrating and infallible blue eyes and big but neat hands that were marvels of surgical skill. Macklin had those same muscular, unerring hands. Sight of the huge bandage drew a grunt of surprise from old Kley. He hooked the slim, fragrantly reeking cigar out of his mouth, wet his broad lips and swallowed. Then he said gutturally and angrily, "Don't stand there. Come inside!"

Macklin blundered in, smiling shakily. "Where's Barbara?"

"Upstairs finishing her bath; she'll be down directly."

Macklin indicated his head, and said jerkily, "This—this thing has been driving me crazy. Wait till you see it! You've got to do something about it, sir, before Barbara finds out about it."

Scowling at the mysterious turban, Kley closed the door and said softly, "We will go into the study."

They heard Barbara's bare feet hurrying down the hall upstairs to her room. Her door didn't close, so Kley closed the door to his office. This was half-study, half-laboratory, and occupied the entire ground floor of a wing which had been added to the east side of the house. Heavy walnut shelves built against two walls to the height of Kley's reach were jammed to the heads with a valuable medical library.

At the rear wall stood a large, windowed cabinet with a murderous and glittering array of surgical instruments

on glass shelves. There was a patent chair fixed to the floor, used for minor operations. Alongside it, a metal stand-ard equipped with a variety of electrical instruments—sterilizing apparatus.

Near the front windows stood Kley's big desk laden with typewriter, the open volume which he had been reading, notes on his own third work, and accumulations of papers and correspondence.

He gestured Macklin into an easy-chair beside the desk, and lowered his own bulk unhurriedly into a swivel chair back of the typewriter.

Macklin's lips parted, but he couldn't say anything. He was plainly in the ripest kind of funk.

KLEY put his cigar out in an ash tray and reflected gruffly, "We've been wondering what you were doing these last two weeks. We knew you were working hard to get the house ready before the marriage, but—" Indicating the bandage with a nod he asked, "What's that?"

"I don't know." Macklin shivered, and his gray eyes were bright with fear. Abruptly, as though he were committing a reckless act, he began to unwind the gauze from his head. Kley watched. In the end, the bandages protected no slightest wound nor head injury. But there was something contained in the bandages which rendered Kley's ordinarily placid face stiff with stupefaction. He let out an explosive breath. Rising slowly from his chair he stared with as much disbelief as though his dead wife Anna had abandoned the rotten mahogany of her coffin and walked into the room. Medical impossibilities.

"For Heaven's sake, what is it?" Macklin asked in a shattered voice.

Kley swallowed with incredulity; his heavy lips worked soundlessly as he bent far over the desk for closer scrutiny. He was plainly agast. "Keep hold of

yourself, boy," he rumbled gently. "It isn't anything. It's nothing at all."

Macklin laughed, a tortured, one-syllable sound. "I'm not a child," he gasped. "Do something about it!"

Bound twice around his sweating head under the many turns of gauze, and now depending from his right temple into a nest of coils on the floor, was a fifty-six-inch length of limp tentacle—a slim, easily tapering rope of flesh.

Kley had never before seen nor heard of anything even remotely resembling it. Formed in general like a serpent, but without any recognizable head, this dangling obscenity was studded from root to tip with close, even rows of hard, rugose nodes or nipples graduated in size from about that of small peas down to pinheads.

At its base, the frightful appendage was horny. More phenomenal still was its partial translucency, within which seemed suspended a complex and fine network of ruby veins stemming from one main dark artery like a backbone. The artery did not seem to continue into Macklin's head.

Kley took hold of the dreadful tentacle, tugged gently. There was no pulse. And the thing was like flexible horn, tough, sinewy, like the tentacle of an octopus save in its tapering roundness.

"Be quiet now for just a little," Kley cautioned in a strangled voice. He circled to the operating chair, selected a tubular chromium instrument from the standard alongside, and returned drawing fine electric cord from a reel under spring tension. The chromium tube was closely jointed, for flexibility, and terminated in a glass capsule which produced a tiny intense beam of white light. This needle of light Kley directed at the juncture of the tentacle with Macklin's head. He played the beam raptly, pushing at the horny root experimentally with his thumb. The light snicked off.

Kley made a clucking sound and mut-



As it shot forward, the worm's frightful jaws opened, revealing murderous fangs. It aimed straight for Kley. His gun roared—

tered, "Damnedest thing." Aloud, to Macklin, "Where the devil did you get this little friend of yours?"

Macklin shook his head. "It sprouted from that cut I got two weeks ago. At first it was just a bud, but it's been growing like—like this. I've been holding up because I didn't want to scare Barbara out of her wits."

Kley made a sound of comment. "The only reason she isn't down here with her arms around your neck is to show you that she can make you wait, too." Soberly, "Tell me about that cut again."

"Why, Barbara and I went picnicking. There's a spring-fed lake on the Joel Spinney farm, north of town. We were going swimming, and I dived in first. The lake has rocky banks, and I grazed my head on a jagged rock under the water, I guess. We drove right back here."

Kley had dressed the wound. "There were three deep slashes, like the work of a knife or fangs," he remembered. His accent had become strong. "Something bit you."

"What, sir?"

"You want this to come off, don't you?"

"Good Heavens, yes! But——"

"There is a perfect line of cleavage at the temple. If the blood vessel is articulated there the way it looks, there won't be any trouble. Relax, boy. We'll dock this fellow in a jiffy." Kley returned the chromium light to the fixture, headed for the cabinet and selected a lean and hungry-looking scalpel and a strong and ugly pair of forceps with ridged jaws.

"No local. Nothing!" Macklin burst out. In a groan, "Lord! I've had this thing in bed with me for two weeks!"

"Is there any feeling in it?"

"No, but the whole side of my head is numb. I don't think I'll feel the knife."

Kley nodded. For a moment the tentacle held his perplexed regard, and then

his hands went to work as though there were brain fibers in his finger ends. Macklin paled as the scalpel flickered in a ribbon of light and theropy growth fairly peeled from his temple.

He remained motionless, but his pallor turned faintly greenish. With a grimace, Kley dropped the limp amputation on the desk in a heap of convolutions and proceeded to sterilize and bandage the raw circle on Macklin's head. Following the line of cleavage with absolute precision, he had not drawn a drop of blood. The membrane protecting the source of the growth remained intact.

IN CONCLUSION, he produced a bottle of hoary old brandy and brimmed a slender, soap-bubble glass of it which he urged on Macklin. Kley had one for himself. After it was down he remarked somberly, "I didn't tell you that I've been investigating the small lake on Spinney's farm. You know it's the only one of its kind."

Macklin's hand strayed to the neat bandage on his temple. "How do you mean, sir?"

Kley listened for sounds of Barbara's coming, then said, "About the way it was formed, I mean." His voice was idly musing, putting Macklin at ease. "Ten or twelve years ago a meteorite fell on Spinney's farm. You might say Heaven did Spinney a good turn. The meteorite smashed through a shell of granite south of the farmhouse, the only worthless ground on his land. It opened a reservoir, and the water climbed to form this remarkable lake."

"Oh, I remember something about that." The brandy was bringing a flush into Macklin's lean face. He kept his eyes away from the thing on the desk near Kley's elbow. "There were some men from the university went down there to take soundings and raise the meteorite if they could. But they thought it must have blown up under water. What did you mean, sir, when

you said that wound of mine was a bite?"

Kley shrugged heavily. With slight reluctance he asked, "You don't really think you cut your head on the rocks, do you?"

"But there's nothing in the pool, sir," Macklin argued. "There never has been."

"I'm not so sure of that," Kley stated ambiguously. Slowly, "I've been talking with Joe Spinney. He had lost a fine dog, cattle, and many of his chickens. This has been going on to some extent for years."

"I don't understand."

"His animals disappear. He has found packs of feathers caught in the rocks at the water level in his lake. What's more, there isn't any small game, no squirrels or mice or anything on four legs, in the woods and pasture near the lake. There used to be plenty."

Macklin laughed uncomfortably. "That doesn't mean anything."

"Spinney and I think it does. The crows raise Ned over the woods several times a week. Spinney has come running, but never got anything but a splash in the pool. You can find the bones of game in the woods. Spinney thinks a big snake is killing his hens."

"A snake? There aren't any snakes around here big enough to carry off a dog. His dog must have run away."

"He told me about hearing a heifer bawling in the pasture one evening. When he got there the ground was plowed up with hoofs, and no heifer. There was also a groove, like the track made by an oversize bicycle tire, hitting through bushes and weeds straight to the pool. And he said he thought the water in the pool looked reddish, but it might have been the reflection of the sunset."

Macklin held himself from shivering, though the night was sultry and without breeze. He remembered his deep dive into the crystal water, and the solid,

wholly unexpected blow his head had received. If some problematical water snake were lurking there, it might have been startled from a nest in the rocks and struck him a glancing blow before retreating to the bottoms. But no such reptile was indigenous to this middle-Western State, if indeed it existed at all. Nor was there any ready accounting for the phenomenon of the abominable parasite growth which had been developing with mushroom speed and sapping his strength for these many days.

Papers rustled surreptitiously on old Theodore's desk.

MACKLIN'S GAZE went rigid and Kley turned his square, massive head with a jerk. The tentacle lay serpentine and still. The air was dead, and Kley thought the thing's convolutions must have disturbed the loose papers in settling. But the suggestion in the sound was gruesome.

"It moved." Macklin couldn't keep the hysteria out of his whisper. His lips were like a scar.

"Nonsense," Kley snorted in his heavy bass. "It has only just settled a little. I'll get rid of it."

The butt of the growth, the root which had been covered with a fine pink membrane after the amputation, was now whitely, gleamingly denuded. Interested, Kley picked up the scalpel and tried the exposed surface with it. The microscopic steel point slipped off. Kley took hold of the firm flesh of the butt and again tried to score the rounded enamel with the steel. But it was of such tight, resistant texture that even the scalper's wicked sheerness couldn't find a flaw.

Faint markings in the bright enamel were discernible. The lines zigzagged closely as though two parts had knit, or like small, wonderfully perfect, needle-toothed jaws rigidly locked. The suggestion of close rows of teeth girt

with a fold of leathery lips was increasingly obvious.

Kley muttered something under his breath and poised the scalpel to make an incision in the specimen just behind the blind head. Before the steel touched it the thing moved fluidly, the coils turning as smoothly as flowing oil. It stilled, and Kley was still with a vast surprise. Abruptly and violently he brought his powerful left hand down and seized one of the coils. With the contact the blood drained from his face. He ripped his hand away and sprang to his feet with a hoarse, convulsive oath. Starting, his eyes were blind with agony.

Macklin shouted, "It's alive!"

That hideous, tapering tentacle with its rows of tough studs streaked over the edge of the desk with a heavy, burring sound. As luck would have it, the horror shot down into the wastebasket beside the desk. All sinew and electric nerve, it moved with lightning velocity and piled up in the wastebasket with the force of a falling club. Simultaneously Macklin erupted from his chair, overturned the steel basket on the rug and knelt on it. He looked up, breathless.

Kley's breath hissed. The palm of his left hand was flayed in a neat strip denuding knuckle bone, muscle and tendon. His palm was a cup of bright blood which brimmed over and pattered on the rug like ghostly little footfalls.

Kley glared at his hand as though he didn't comprehend what had happened, then broke for a washstand at the end of the room. His hand hurt as though seared, but his face was merely grim. He washed the wound and kept swabbing it with brownish stuff from a bottle he snatched from the cabinet. The spring of blood lessened, and at last he was able to bandage the numb hand. His bull voice came over his shoulder, "That devil! Don't let it get away!"

"For Heaven's sake, what is it?" Macklin asked frantically. A commo-

tion in the wastebasket shook him, magnifying his horror.

"There still are forms of life that we have never dreamed of," Kley said with a kind of cold passion. Then, his eyes quirked with realization, he added, "You know, that hellish thing was mature. That's why there was such a plain line of cleavage. In a few hours it would have detached itself from you naturally if I hadn't cut it off. Ah, if I only had had the brains to cut it in two!"

"But, Dr. Kley——"

Scowling, Kley turned and snapped with a kind of sinister intelligence, "Something in Spinney's Lake bit you, and impregnated the wound. Nature tries all methods of reproduction."

Which meant that another nightmare like the one imprisoned under the basket dwelt in the bottoms of Spinney's Lake. The fact that the monster was of an unknown species did not make it less appalling. In a race of thought Macklin played with the possibilities of the monster's origin. It could not have been indigenous to the subterranean reservoir on Spinney's farm. But the seed of it might have been carried in by the meteorite out of the vastness of space. Cultures of unknown bacteria and fungus life capable of withstanding extremes of heat and cold had been obtained from meteoritic bodies before this.

IT HAPPENED before Kley got back to the desk.

Macklin's hundred and eighty-odd pounds shivered and bucked above the upended wastebasket as though he were trying to hold down a series of explosions. He cried out, "I can't hold it down!"

Abruptly, he sprawled headlong into Kley and knocked him off his feet. A litter of waste paper and cigar butts and ashes went flying. They scrambled to their feet at once and in the follow-

ing frenzied, futile moments they ransacked the entire floor area of the room, on the rug and the tiles and under furniture, but Macklin's little friend had gone into good hiding.

"Well?" Kley exploded gutturally, baffled. "Where did that devil go?"

"It—it just disappeared," Macklin stuttered. He felt like a complete fool. Still dazed, he wiped the perspiration from his throat and face. His temple throbbed. The prodigy having vanished, it seemed now to have been only some gruesome figment of the imagination. He piously wished it were.

But there was Kley prowling tensely about the room with the breathless industry of a big mastiff. Macklin fought down the hysteria that was beginning to shake him and kept searching, too—futilely. His breathing had accelerated raggedly.

The door of the study swung open, framing Barbara Kley's loveliness. She was blond, with hair like molded honey. She had a challenging, fresh, oval face, velvet lips, her father's blue eyes, a boyish and statuesque figure in expensive green silk. She looked from Macklin to her father, at the overturned wastebasket on the sumptuous rug, and alarm jumped into her eyes.

"What have you been doing down here?" she asked sharply. "What's the matter?"

"Nothing!" Kley boomed. "Quick! Close the door!"

Barbara stepped into the office; the door closed heavily behind her. She saw her father's bandaged hand and Macklin's temple and said worriedly, "You're hiding something. Tell me what's wrong. Why were you making such a racket?"

Kley softened his voice. "Wait for us in the den, Barbara." His gaze shifted restlessly, searching the floor. "We have a little work to do; it won't take long."

She appealed to Macklin. "Have you stopped loving me? What's the trouble? How did you hurt yourselves?"

"It's a—a specimen I brought," Macklin said rapidly. "We were examining it, and had an accident. It got away. That's all."

"Oh, that's all!" Barbara mocked. "What kind of specimen was it, then?"

"A leech," Kley blurted irritably. "A giant amphibious leech."

Macklin thought of the spontaneity with which the thing's bloodsucking apparatus had flayed Kley's hand, and looked as sick as he felt. He pleaded, "Wait outside for us, Barbara."

"I'm going to stay right here," she said determinedly.

"Stay close to the door, then," Kley warned. To himself, "Lord! We can't let that hellish thing get loose!"

A stealthy, rubbing sound originating from the bookshelves drew the attention of all three.

"Listen!" Kley ordered in a whisper.

THE SILENCE was enormous, and then the leathery studs of that thick, whiplike nightmare were again rubbing against one of the walnut shelves behind the books.

Kley ghosted soundlessly to his desk and quietly drew open the shallow middle drawer. In the course of his profession he had had to deal with maniacs and criminals, and therefore kept at hand the seemingly clumsy but wonderfully efficient automatic which he had used in the War. With this deadliest of small arms he was an infallible shot.

Macklin advanced with him to the bookcase. The slight sound of their approach made the leech still. But it flinched, behind the books, in response to the click of the safety button on the automatic rooted in Kley's fist.

They located the leech. It had retreated behind the books on the third shelf from the bottom, having entered

through the space between the tops of the books and the shelf above. When it sprang free from the wastebasket it must have shot through the aperture like an arrow. At a nod from Theodore, Macklin cautiously took hold of half a dozen books on the shelf, suddenly whipped them out and leaped aside.

Barbara saw the head of the thing and screamed with the report of the ugly gun. It was a miss. The leech disappeared backward in motion too quick for the eye to follow. But there was a bullet hole in the backboard where the head had been.

"Quick, eh?" Kley ejaculated. "Don't let it get near you. Those rows of buttons on it are suckers; you saw what fast work they did on my hand." Blood was seeping through the bandage now.

In that brief glimpse they had seen the amphibious worm's frightful jaws. The jaws were supplied with long, curving, murderous fangs anchored well back in the head by sloping roots. Such blind ferocity in any living thing was enough to shake any one's nerve, but Macklin stole vengefully, crouched over and listening, along the wall of books.

At the end of the shelf a length of the blind tentacle issued like a snake striking. It stabbed half a dozen times, in a blur of motion, at the books on the shelf above. It shot through the aperture above the books on the fourth shelf before Macklin could get out of Kley's line of fire. He cursed and looked back at Kley with his lips twitching.

"Never mind," Kley grunted. "Just so it doesn't get out of the room."

Still at bay, the monster no longer advertised its exact position by prowling behind the books. One way of locating it would be to jam one book after another against the backboard, on the chance of pinning the creature momentarily.

Kley had the idea, too. "But it's too dangerous," he advised. "Think of how

powerful it is and how fast it can move."

"You're not going to do anything as crazy as that, Willard," Barbara chimed in, terrified. "Where did that horrible thing come from?"

"From Spinney's Lake," Macklin said shortly. He mopped the perspiration from his face and said to Kley, "Do you suppose that damned thing can hear? It acts as though it can."

"We can find out."

Macklin whistled piercingly, and was rewarded with a spasmodic slurring sound near the end of the shelf closest to the door.

"So," Kley rumbled, gluing his eyes to the spot. "Tactile hearing. Tough as they are, those suckers must be sensitive enough to pick up sound vibrations. Lord, what a foul thing! All mouth! In that case we do it this way."

With his lips straight, Kley nosed the gun against the back, low, of a cloth-bound work on forensic medicine. He squeezed the trigger. In the closed room the report of the gun was stunning. Simultaneously a block of books erupted in Kley's face, knocking the pistol from his fist as he staggered backward and recovered his balance.

THE MONSTER'S TAIL lashed out, a quivering, tortured whip of living sinew. Barbara was speechless. As Macklin dropped to all fours and scrambled for the gun, the monster raged down the shelf. In a boil of whipping steel it catapulted more of Kley's prized volumes from the shelf. The thing's coils thrashed powerfully in plain view for an instant, and then it appeared to dissipate among the splashing pages of Kley's books.

Kley held his battered jaw and gasped, "My! My, dot's actif!"

"Active!" Macklin snapped, mocking Kley's guttural understatement. "Not any more, though. I think you put a shot in it that time." But doubt and excitement had accelerated the beat of

his heart to a continuous murmur of pain. And he was no stronger for his two weeks of sickness. The leech might be injured, but it wasn't dead, and he couldn't find it. He moved the books on the floor aside with his foot, and flirted glances along the disordered shelf of books. They listened. There was not the least stir of movement. With a puzzled grunt, Kley stooped and made the wastebasket clang with a rap of his knuckles. There was no response from the bookcase to this new sound. Macklin passed the gun back to Kley, hunched his shoulders and without a word began emptying the fourth shelf. Nothing there.

He asked Barbara, "Did you see where it went?"

Her eyes were wide and brilliant, and she couldn't speak; she shook her head.

Macklin unloaded the third shelf, stacking the books on the floor. He was wet with perspiration. So was old Kley, who stayed close beside him with the ready gun.

Then it had to be the fifth shelf. Damn the thing's silence!

"Careful, now!" Kley warned.

Macklin's eyebrows were laden with sweat and he felt dizzy. He mopped his whole face and neck, mentally gearing himself for another encounter with the giant leech's ready fury. He hoped that it was dead, that the effect of Kley's shot was the hideous worm's dying agony. An idea occurred to him. The leech was a blind and deaf thing, but the one sense with which nature endowed it made it as formidable as a tiger. If it could feel sound, conceivably it could feel light. Tactile vision, as in plant life. Its first act upon coming alive was to streak for protective darkness. The apertures in the bookcase were the darkest shadows in the room. They had taught it not to answer to sudden sounds, but sudden light might goad it.

"What's the matter?" Kley asked.

"I've got an idea," Macklin answered. "I think light bothers that thing. You know, the way a shrill note hurts a dog's ears."

"Good!" Kley nodded. According to Spinney's information, the curse of his lake went abroad pillaging chiefly after dark. If it slaughtered stray chickens during the day, it was a dark day, or else it was driven into the sunlight only by its unappeasable hunger. It was, as Kley expressed it, all mouth.

Macklin got the chromium peep light which Kley had used and bent the flexible end so that light could be directed downward behind the row of books. He wet his lips and asked, "Ready?"

"Ready," Kley grunted. "Try it here at the end, first."

Macklin slipped the slim but powerful torch deep into the shelf and directed the bent end downward. Kley stood woodenly. The automatic was like part of his fist.

FROM THE DOOR came the soft rush of Barbara's breathing. Against her white face her lips looked like a bright scar.

Macklin snapped the button on the torch and a beam of light spurted down behind the books. The sudden impact of the light must have tormented the cornered leech just as much as the bullet. At least, the spontaneous fury of its reaction took both Kley and Macklin by complete surprise.

A section of the big medical books burst from the shelf as though dynamited. A book caught Macklin across the throat, filling his head with fire. He dropped the torch and it snicked back into the fixture beside the operating chair.

As though it had been shot from a gun, the maddened leech struck athwart Kley's body with a sickening, clubbing sound and all his breath left him ex-

plosively. The thud of impact was sharpened by the clean crack of bone. The gun sounded with three mighty reports in quick succession.

Drawn up stiffly, as though in insupportable pain, Barbara parted her lips to scream, but the sound was only a long, searing whisper. Her eyes looked mad.

A frantic gobbling sound issued from Macklin's throat. He hurled himself at the doomed Kley and tried to rip off the leech. But he snatched his hands free instantly with blood running from his finger tips. Kley blundered backward into the bookcase, his massive body warped.

Like a spiral of steel cable the leech bound Kley's body. Its blunt, horny head had gone through his jacket and was half buried in his breast. Studded with ravenous suckers, the leech bound his left arm crushingly against his side and continued around his waist, feeding. Kley's chest was in an inexorably closing vise and his blunt features fast empurpled with the stoppage of circulation and lack of breath. Veins stood out on his face in knotted violet cords. When the thing went around him like a steel hose his left arm had been broken. But what shocked Macklin and Barbara to the point of insanity was the way in which that spiraled length of ferocity was melting into Kley's helpless body—feeding, through fabric, deep into his flesh.

Macklin had snatched up the scalpel and was back with it. Kley brought up the gun in a trembling arc and half unconsciously prodded the leech with the muzzle. His broken arm dangled. He tried to say something to Macklin, but his lungs had collapsed and his lips scarcely quivered.

Holding the scalpel like a dagger, Macklin attacked the leech just behind the head, cramping Kley hard against the gutted bookshelves. Severing that

tough sinew was like trying to cut tempered rubber. Kley shook his blackening head in a wordless negative. Macklin got the blade of the scalpel under the leech and jerked with all his strength. The crazy violence of that effort severed the leech's head from its body, but it was too late. The gun roared, jumped in Kley's fist. His arm dropped and the gun fell on the floor. The bullet had passed through his heart; his body relaxed and he pitched forward.

The leech was dying. It worked convulsively, freeing itself in bursts of nervous reflex from the dead surgeon's body. Scarcely knowing what he was doing, Macklin reached down and snatched it entirely free. He whipped it high over his head and smashed it down on the floor with the bitterest passion. Then, aiming deliberately with the gun, he discharged the five remaining bullets into a twitching length of blind sinew that was still trying to crawl. He continued pulling the trigger after the clip was exhausted, until Barbara ran sobbing to him and stopped him.

Called by neighbors, a squad car had stopped in front of the house; two uniformed cops were hammering on the door.

THE POLICE LIMOUSINE passed the city limits, heading for Spinney's farm. This was early on a brilliant and hazeless afternoon five days following the death of Dr. Theodore Kley. Beside Detective Joseph Waller, who was driving, sat Detective Sergeant George Brehm, with a bomb in his lap. The bomb consisted of numerous sticks of dynamite roped together, with a cap and a coil of fuse like a whitewashed spring. Hence no one was smoking.

In the rear seat rode Barbara Kley with Will Macklin, who also carried a burden. This was five pounds of beefsteak wrapped in brown paper. The paper was getting wet with meat juices.

The limousine was brought to a stop at the edge of Spinney's woods, a moderate sprint from the roughly elliptical lake. Macklin compelled Barbara to remain in the car and accompanied the two detectives.

In a land of lakes Spinney's Lake could be called only a pool, however deep and crystal-clear. The water was of unquestionable purity, but some vestigial instinct deterred the farm animals from picking their way down through the garter of rocks to drink at the water's edge.

The three men halted on the brink of a granite table overhanging the untrembling mirror of water—a surface of breathless innocence that was, but just as false as a spoken lie. The overhead sun, now inclining more appreciably from the perpendicular, penetrated to an unusual depth. But no moss grew on the rocks, submerged or on the banks. And there were overhangs and labyrinthine caves in the depths where it was always absolute night.

Without delay, Macklin pitched the sodden package of meat toward the middle of the pool. The water geysered; but even while it was quieting they could see the package sinking, staining the water a little. Far off on a brown-black slope beyond Spinney's farmhouse crawled a team of horses with their black coats shining with sweat. Spinney sat hunched on the cultivator they drew, and from beneath him climbed a soft plume of dust.

Out of the pool's depths, while the package was still in sight, foamed a savage projectile of such proportions that the two hard-boiled detectives jerked backward, getting in the way of each other. The leech was a larger edition of the one Macklin had killed. More than a dozen feet in length, it seemed even more horrible with its maculations of dirty-tan and violet and inky-black flecks. A spotted nightmare,

jaws parted in living murder. It struck and overshot the mark as its coils whipped around the package of bloody meat. Water burst over the pool in a glittering shower like broken glass.

The bomb had been set down on the granite footing. Macklin lighted a match and touched the petal of flame to the fuse. It ignited with a spurt; he lifted the bundle of dynamite sticks with both hands and heaved it into the pool.

"Run like hell!" he blurted, and was sprinting for the police car before the bomb hit the water.

Waller and Brehm weren't far behind him. At the car the two detectives plugged their ears and turned around to watch, but Macklin piled inside and took Barbara in his embrace.

She buried her head in the hollow of his shoulder and sobbed. "Don't ever leave me." Her voice was blurred. "Can't we get married to-morrow? Do we have to wait any longer?"

"No, darling, we don't have to wait any longer."

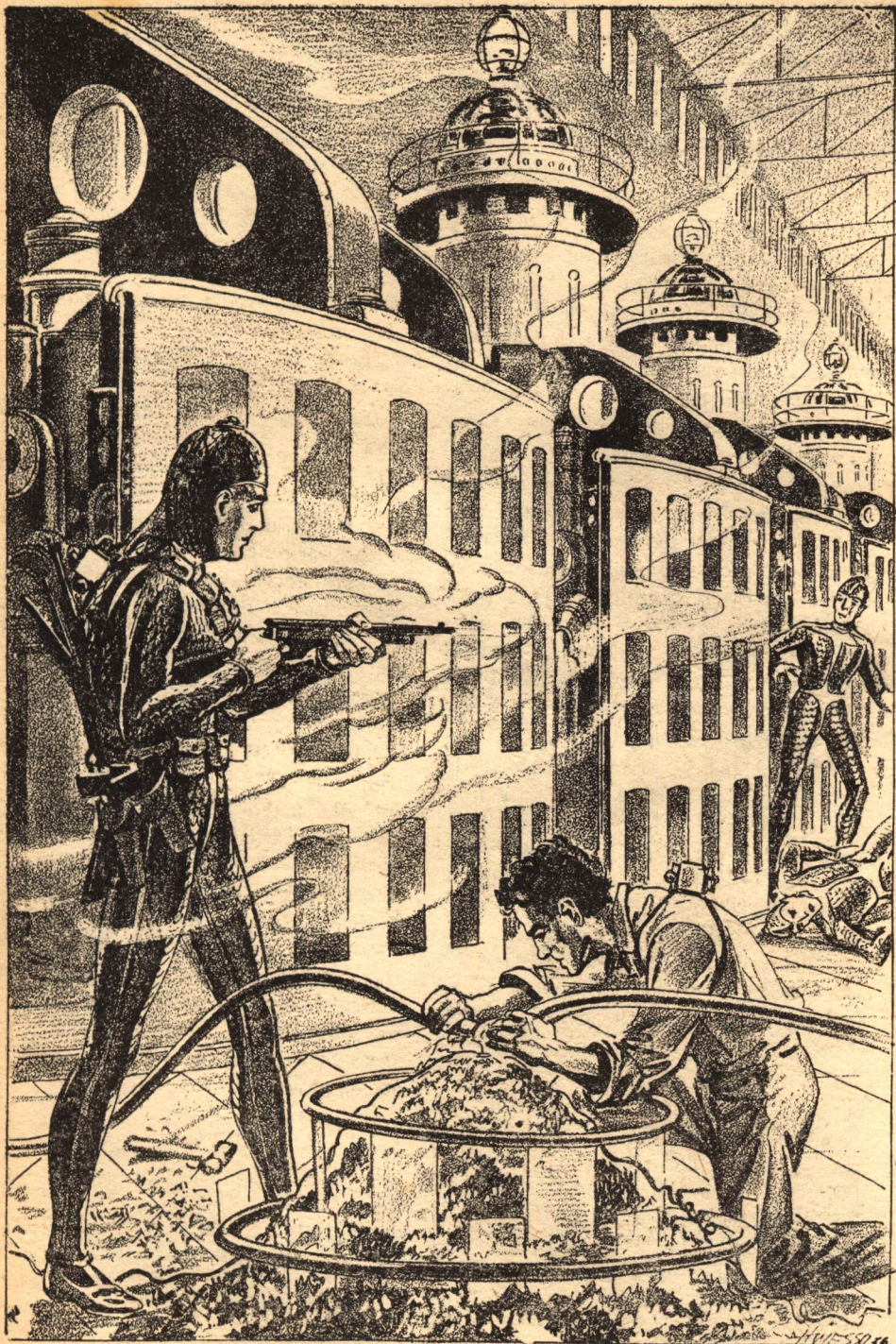
Then the earth vibrated as the bomb went off. The jagged granite walls of the lake acted like the bore of a cannon, and earth and steaming water smoked up into the sky with thunder like a volcano. The echoes rolled back in deafening concussions, and the banks of the lake caved in, completely sealing the reservoir. Where the lake had been was a shallow crater with saffron smoke and dust hanging over it. In the distance Spinney's team broke and stampeded down the long slope.

Detective Waller lighted a cigarette nervously. "Say," he asked, "did you see what snagged onto that hunk of bait?"

Detective Sergeant Brehm cleared his throat. "Yeah."

"What the hell was it?"

"I don't know," Brehm said forcibly. "And so help me, I don't ever want to know."



Nick worked like a madman. Two more men dashed in. A burst of shots brought down one—

The Incredible Invasion

Part Four

by Murray Leinster

UP TO NOW:

Professor Blair, while in the midst of his work on Straussman's theory—showing that two objects can exist in the same place at the same time—suddenly disappears.

Steve Waldron, a biologist, is in love with Blair's daughter, Lucy, as is Fran Dutt, a foreigner who is laboratory assistant to Professor Blair.

At Fran's request, Steve and Lucy drive from Newark to New York. They see human beings freeze in their tracks as if paralyzed, till all seem waxlike and dead. They alone, because of something Fran has put in the car, escape unharmed.

Newspapers report Newark a dead city, wiped out by plague.

Steve knows differently and suspects Fran's compatriots of invasion.

Everywhere Steve and Lucy go becomes a "plague spot."

Crowds flee from New York in panic, causing riots and bloodshed.

Steve and Lucy go to White Plains. There Steve discovers that by means of high-frequency electricity he can bring waxlike mice back to life.

Equipped with battery generators, Steve and Lucy set out to explain their find to an anxious world. But, being believed plague carriers, it is not safe for them to let their whereabouts be known.

They decide their only chance is to invade the stricken city and learn more of the foreigners—who, Steve is now certain, are from the fourth dimension,

or the other world occupying the same space as ours.

In the city, Steve attacks one of the Invaders and dons his protective armor.

In their wanderings through the city, they find, within a trolley terminal, a great helix of bronze bars. Trucks, driven by the Invaders, are run into this and disappear. It is the entrance to the other world!

The Invaders are looting the city—taking away all they can of any value and all the most beautiful girls. The work is all done by the Underones, who cower before the loaded canes of the Leaders.

Steve, remembering that his friend, Nick Bannerman, a newspaperman, is within the stricken area, sets out to find him. After Nick is revived he takes them to a short-wave station to attempt to get a message to the outside world. The message is intercepted by the Invaders, from whom they barely escape.

They take refuge in a garage, where they are discovered by Fran Dutt. He points a tiny gun at Nick and Steve; they become waxlike figures. Fran then declares his love for Lucy.

IX.

LUCY SOBBED. Steve remained utterly motionless. Fran no more than glanced at him. The radiation or field of force—whatever it was that turned living men into corpselike images in the fraction of a second—had been so utterly effective

that merely to see Steve rigid was to Fran Dutt proof that he would stay that way. There were already six hundred thousand human beings in the cataleptic state of the Invaders' contrivance.

Fran put away the small-caliber pistol and said desperately: "Listen to me, Lucy! I have tried to save you. I have acted as a traitor to my homeland, trying to make you safe. I have not asked anything in return. I have made no bargain. But you must listen to me!"

"You've killed my father," cried Lucy bitterly, "and you've killed Steve, and now——"

"Your father is not dead," insisted Fran. "I beg of you, Lucy! See, I go down on my knees to you! But listen!"

He did kneel before her, his features contorted. He was horribly in earnest.

"I cannot let the Leaders take you!" he cried. "You do not know our Leaders! You cannot imagine such beings! I will not let them take you. You are beautiful, and they would want you for themselves! I will kill you first, Lucy! I love you, and I will kill you first!"

"Then do it!" said Lucy fiercely. "You've killed every one else I care for!"

"No! Your father still lives. He is in the laboratories of the Leaders. He works—but he is treated well. He is even happy! The Leaders know better than to illtreat scientists! Straussman filled them with such reverence that they will only keep your father prisoner. And Steve is not dead. You know that also. He will go to the laboratories, too. He will help your father, perhaps. They will be friends. They will have work that they love and good treatment—everything but freedom."

"Then—then if my father is alive and well, but a prisoner," cried Lucy desperately, "and if Steve's going to be a prisoner, let me be a prisoner, too!"

Fran Dutt wrung his hands.

"I could not! Everything that is

taken through the tunnel is inspected—especially women. You would be taken for the Leaders. I could not take you to your father."

Lucy made a helpless, despairing gesture.

"But, Fran—I liked you once! And—you've kidnaped my father and maybe you've killed Steve, and you're fighting my country! How can I believe you couldn't help me if you chose?"

Fran Dutt stood up. He did not touch her, and his tone was infinitely pleading.

"But hear me, Lucy! I cannot be more of a traitor to my homeland! I hate this invasion as you hate it. I hate the Leaders as you would hate them—more, because I have felt their whips! But my father and mother and my brothers and sisters—they are security for me while I am in this world of yours. If I fail our Leaders, they die by torture! How can I fail them?"

"Then what can you do; what am I to do?"

"You can let me save you," said Fran Dutt bitterly. "That is all that I can do. I will hide you. I will take you to a place where you will be hidden from my countrymen. Soon they will strike New York. They will strike Philadelphia. They will strike all the cities of the East. Then they will forget this place and I can come back to you and—and we can be happy, perhaps, because I will never let our Leaders see you. I can do no more than that, Lucy, nothing more. I swear it!"

LUCY stared at him in the queer, reflected glow of the flashlight on the floor.

"I—think I believe you," she said through stiff lips. "After all I—used to like you, Fran. You're probably trying to be decent, in your way. But it isn't enough. Losing father, and Steve, and everything else—— No. It

isn't enough, Fran. I think—I think I prefer dying."

Again Fran wrung his hands in anguish.

"And I can't let you! I won't let you! I—I cannot plead with you, Lucy. I have said all that it is possible for me to say. But you must not die! I will take away that device Steve has made, and you will become like Steve. I will hide you carefully, and come back and waken you and plead with you again. I cannot let you die, and I cannot let our Leaders have you!"

His expression was pitiful.

"Don't make me do that!" he begged. "Please, Lucy, let me hide you where you will be safe——"

There was a sudden, quite impossible movement. And Steve's voice came, quite icy and entirely even. "No need, Fran. I'm still on hand to look after Lucy—and I'll blow you to hell if you reach for that gun!"

He moved easily forward. The muzzle of his revolver touched Fran's side as he plucked away the small-caliber gun Fran had used before.

"I killed one of your gang," he said, pocketing the weapon, "and put his armor on. It's under my clothes and works very well, thank you. I needed to know a few things, and I found out one or two. Incidentally, I don't think you hurt my high-frequency pack. Lucy, slip it off me. I think there's just a lead to my right wrist broken. If so, you can twist it together again and put it on Nick."

Lucy's hand trembled as she moved to obey.

"I—had forgotten about that armor," she said shakily. "But, Steve, I think Fran is telling the truth. You won't kill——"

"Kill him? Not if I can help it," said Steve.

He shifted his gun from one hand to the other as Lucy slid the straps from his shoulders.

"When Nick comes to," he said grimly, "we'll talk."

Lucy tried to get Nick's broken pack off him, but could not because of the iron hardness of his muscles.

"Stick the leads of my pack on his wrists," said Steve curtly. "Then make sure the juice is on."

Lucy worked with fumbling fingers. Nick's rigid figure relaxed; he fell forward on his face. He swore luridly and got up.

"What the hell—— Oh!" He swallowed suddenly. "I saw him shoot. Then I was on my face. Damn! Have I been dead again, Steve?"

"Something like it," agreed Steve evenly. "Get your pack settled and put a gun on Fran, here. And understand, Nick! I haven't any particular grudge against him, because what he's done I believe he's had to do. But he's got something we need, so if he tries to get away don't hesitate to shoot him! This is a sort of war in which we're fighting like hell. That's all."

"I get it," said Nick vengefully, "and I promise not to mind shooting him!"

HE got out his gun and settled down with the muzzle bearing on Fran. Steve holstered his own weapon and fumbled in his pocket.

"I bought some writing paper and envelopes a day or so ago," he said dryly. "I only used one sheet and that one did no good. I forgot to throw away the others. Fran, could you make a suit of armor like the one you're wearing?"

Fran Dutt said harshly: "No, I couldn't. I am a spy and a theoretic physicist, but I do not know the processes for making this armor. Your high-frequency outfits work as well, but are not as dependable."

"Good!" Steve rested a sheet of paper on the mud guard of a car beside him. He prepared to write. "We'll pretend, for the purposes of this docu-

ment, that I haven't invented it either. Now listen as I write."

The fountain pen scratched as Steve wrote:

"Report of Operative 27D, in Newark, N. J.: I have so far failed to secure more information concerning the armor used by the Invaders, and Fran Dutt has been able to supply me with only one more suit for examination and tests. He points out that this is extremely dangerous work for him, and that the revolutionary plot in which he is engaged is much more likely to lead to the failure of the invasion.

"With a sufficient supply of the NN gas, whose effects and use I have described to him, he is sure that he and his fellow conspirators will be able to overthrow the entire governmental system of his nation. He offers to sign a treaty with the U. S., promising all possible reparations for damages done in this invasion, if we supply his party with poison gas. He is authorized to sign, 'Fran Dutt, for the Revolutionary Committee.' I do not know how much reliance can be placed upon this. The helix by which the Invaders maintain communication will be fully sketched and an outline of its theory is promised within three days."

He glanced up. Fran Dutt looked like a dead man.

"Steve! What—what do you mean by that?"

Steve folded up the paper.

"It's phony, of course," he said. "It's a lie from beginning to end. But I'm putting it in my pocket. Your crowd can't get me except by killing me. The need to kill me will arouse curiosity. They'll search me carefully. They'll find a suit of armor and wonder how I got it. Then they'll find this. What will they think when they find it, Fran?"

Fran's forehead glistened with sweat. "That I'm a traitor," he said in a thin voice. "They'll kill me. But that doesn't matter. They'll torture my father and mother and brothers and sisters. Steve, you don't know what hellish——" His voice broke. "You

can't do this, Steve! You don't know what it means!"

Steve said grimly: "It's because I can guess what it means that I'm doing it. It's war between your nation and mine, Fran. As an individual, I rather like you. In your place, I'd probably do just what you've done. In my place I'm sure you'd do what I have. But while I have this on me you won't tip anybody to anything useful against me."

Fran Dutt's knees gave way. His teeth chattered. "If you'll kill me and tear that up," he said unsteadily, "I'll thank you, Steve. On my honor, I'll bless you if you just kill me and tear that up!"

Steve shook his head. "I can't. I'm up against it. Your fellow spies have our authorities pretty thoroughly fooled. So I have to fight as I can. I'm guessing, Fran, that you wouldn't be killed instantly."

Fran shook his head. His throat was dry.

"Torture, too," he said huskily. "But not only myself——"

"They'd ask you questions," said Steve inflexibly. "Under torture. You'd talk. You know you'd talk. And even if to avoid it you'd killed yourself beforehand, if this was found on me they'd question your friends—the ones most likely to sympathize with your revolutionary aspirations. Wouldn't they?"

Fran made a choked sound in his throat.

"So my advice," said Steve, "is to go back to your homeland and tell your friends about this. Get that revolution going! Because either I win, over here, and your damned Leaders are licked, or else I'm killed over here and they find this on my body. So—go home and start your revolution!"

FRAN DUTT sat still. The color did not come back into his face. But from a man utterly crushed, very slowly

there came over him the look of a man who sees a fighting chance—not a good fighting chance, not even a fair fighting chance, but a chance that by sheer desperation might possibly be made to work out.

"I offer you my life," he said unsteadily, "if you will tear it up."

"I can take your life anyway," said Steve. "It's not enough. No price will be enough but a revolution—unless we win and drive back all you Invaders, and then make what you call tunnels of our own and come to your world and fight you there!"

Fran Dutt said, still unsteadily: "I—I shall try it, Steve. I cannot help myself. And perhaps"—he smiled in a peculiarly mirthless fashion—"you have done us a favor. Our Leaders keep we Underones thoroughly cowed. I have urged revolt before. But they keep our spirit broken by whippings with the metal-studded whips all Leaders carry instead of canes, by tortures for rebukes, executions more horrible than you can imagine, for offenses that in this world are trivial. So many of us fear the punishment of failure that we have not dared to act. But now there will be punishment if we do not act!"

Steve said nothing. He watched, his eyes narrow.

Fran Dutt steadied himself. "I know what I face. I will tell others. If I am accused of treason there are others who will be accused. Under torture, they would accuse yet others. Ah, yes! And it would be accusation of such a treason that no man would be forgiven for having concealed it for one hour! There is a Revolutionary Committee, Steve. We call it by another name in our language. And it has been afraid to strike. But now it will not dare to strike! Either you have done us a favor or——" He smiled again, his face dead white.

"Yes, either you have done us a favor, or else you will be cursed by so many

men, suffering such agonies as they die, that their curses will pass even the boundary between your world and mine and strike you!"

Steve said evenly: "Every blow struck against your Leaders here is so much of a help to your revolution in your own world."

"True," said Fran Dutt. "But there are some things one cannot do even to win a revolution, Steve. And to be a traitor not only to our Leaders but to my homeland—that I cannot do. I tell you no secrets of our weapons, even of those I know."

"My guesses, though, have been right? About Straussman?"

Fran Dutt smiled faintly, still chalky white. "To be sure. What harm to tell you? Straussman appeared suddenly in our world many years ago, thirty or more. He appeared suddenly in an open field outside of one of our cities, with a structure of metal about him. It was like a monster egg, and many people saw it appear. For a long time he did not open it. I suppose he was testing our air for breathability. There was a huge crowd of our people about his huge egg when he did open it. There were Underones and Leaders, too, and all were a little frightened. When Straussman appeared some thought he was a god."

STEVE glanced at Nick. Nick listened, but skeptically. He kept his revolver pointed at Fran.

"Our Leaders," said Fran, "were respectful to Straussman. They took him to their palaces and gave him rich food and women—women whom they took, as is their custom, from us Underones. He learned to speak with them. He showed them marvels.

"A palace was built for him in which many Underones labored on strange machines. And Straussman became more arrogant than even our Leaders. Then new things began to appear, new

weapons, new books, strange knowledge. The Underones who worked in his palace told of groups of Leaders who went into a strange machine with Straussman and vanished, and many hours later returned. It was a tunnel, I suppose. They brought back machines, sometimes living things, plants, dogs, which were more intelligent than the dogs we possessed. They even brought back horses. And there were men who were wounded or drugged, and much more often there were women.

"Those other persons from your world, Steve, were not treated with the respect given to Straussman. They were kept in a stockade. Children of the Underones were sent to them to school. I was one. We were to be trained as spies. We learned many things, but we were never allowed to forget that we were Underones, and that a terrible punishment awaited us and all our families if we failed our Leaders."

Lucy said uncertainly, "Charles Fort wrote——"

"What's that?"

"He wrote books," said Lucy, "listing mysterious disappearances and appearances, people vanishing under impossible conditions. He thought it was what he called teleportage—carrying to a distant place."

"Our Leaders' doing," said Fran. "They brought many people, by ones and twos, from different parts of your world. They brought machines, and even ships. But usually they killed the crews of those ships. There was one ship whose crew fought so fiercely that they brought no more. It was called the *Cyclops*."

"The *Cyclops*!" said Nick, staring. "The hell you say!"

"That was its name," said Fran. "Its disappearance caused so much comment in this world that our Leaders were alarmed. Because they feared this world. There are more people here—

many more people! And this people believes in rule by itself—democracy—which is a fearful idea to our Leaders.

"For many years they have been terrified lest other scientists duplicate the work of Straussman, who is dead now. For a time they planned to make our world so great in civilization that it could defend itself. But they dared not trust we Underones to learn too much of science, and they are too arrogant and too indolent to labor at research themselves."

"I begin to see," said Steve dryly. "They kept spies here. And recently those spies have been reporting great interest in Straussman's theory. Your Leaders, Fran, have decided that it's only a matter of time before our scientists duplicate his work and we learn about your world. And, being afraid of——"

"They have attacked," said Fran. "Our two civilizations were about to meet. And ours would have been destroyed by the contact. So our Leaders attacked yours first. They propose to shatter your civilization utterly. First they struck Newark, so that all your truly wise men, your scientists, would come to try to understand what had happened. Then they struck at them. Most of your scientists are already victims of what they call the plague, and our Leaders will scatter the rest of your civilization without danger. It will yield them unlimited loot and countless pretty women—and our Leaders will have two worlds in which to swagger!"

"Meanwhile Lucy's father works in their laboratories," said Steve dryly, "and I suggest that he might help you in your proposed revolution. He's no fool, Fran. But neither am I, and your armor is better than our high-frequency packs. I'm going to take it, Fran."

Fran went white.

"That's the same as killing me, Steve. If you do it, you ought to tear up that paper you wrote. Others——"

"I'm giving you a high-frequency pack," said Steve. "Nick, hand me your gun and hold his wrists so he'll draw high frequency from your pack while he slips his armor off. Lucy'll put it on and give him her pack. It's playing a dirty trick on both of you, but Lucy has to be safe."

Fran stared at Steve. Steve's face was absolutely grim.

"I don't want to knock you cold, Fran," he said shortly, "or shoot you, either."

Fran licked his lips. He shrugged. Nick gave Steve his gun. He took hold of Fran's wrists. Fran wriggled out of his armor. Nick suddenly removed his hands. Fran stiffened and started to fall. Nick caught him and he straightened up, biting his lips.

"I just wanted to be sure," said Nick vengefully.

Lucy donned the armor, discarding her skirts behind one of the dismantled cars. She looked slim and very boyish when she came back, carrying the pack for Fran. He slid it over his shoulders.

Nick stepped back. "I'll take my gun again," he said. "I don't trust this guy!"

Steve nodded. "Now," he said coldly to Fran, "we'll be on our way. Nobody else has a listening set to pick up the noise of Nick's pack, which is a great relief. I'll take this flashlight. I think it's going to come in handy. You stay here, Fran. I'll leave your pistol on one of the four corners a block to the east. It'll take you some time to find it, and since you don't know where we're going, you're not likely to track us down."

HE BECKONED to the others. Fran stood ashen white in a queer costume of tunic and leggings which was obviously the national garb of the Invaders.

"But Steve! Fran!" said Lucy. "What will he do? If he appears with-

out his armor and with one of our packs they'll——"

"He knows what I'm going to do!" said Fran harshly. "What I've got to do!"

"He'll knock out one of his countrymen and take his armor. That other man will disappear until all of Newark is revived. But Fran will set to work on his revolution."

Fran clenched his fists. The other three went out of the garage and into the uncanny, horrible silence and darkness of the dead city. It was not a silence nor a blackness to which one could become accustomed. After speech and light—even furtive speech and dimmest light—within a shelter, to come out into the tomblike horror of the city whose inhabitants lay in contorted heaps—— And there was the sensation of being hunted to add to the feeling of horror.

Steve led the way purposefully. A block from the garage he stopped and put down Fran's pistol as he had promised.

"What are we going to do now?" asked Lucy in a whisper.

"The same thing," said Steve. "But this time we can't lose! We've gone shuttling back and forth between the cordon and the town until it's getting silly. And it's especially silly because we could have tried this trick last night, or to-night for that matter, without coming back to town at all. Nick has to do it, though."

"What?" demanded Nick gloomily. "I can't use short waves without those devils picking it up."

"We've both got flashlights," said Steve disgustedly, "and didn't think of using them before. It's certain to work. But it wouldn't be a bad idea to have Fran making a back fire for us anyhow."

Nick exclaimed profanely. Then Lucy said "*Sh-h-h-h!*" and the three of them stopped short, motionless as so

many statues. There was a little rustling somewhere near, presently the purring of a car. It died away.

A thought came to Steve as they tramped through blackness. It was a disturbing, even a terrifying thought. But he fought it back. The Invaders could do one thing to make all his attempts at signaling useless. It would require quick action, almost instant action. It would mean pushing forward all the Invaders' plans. But they could do it.

He told himself that they would not think so quickly. He had to believe that, or he would have had no hope at all.

THEY came out of the town. There were open spaces on either side, stars overhead, and glittering blue-white street lamps, far away. They trudged on heavily. All of them were weary. They trudged on, and on, and the armor tired Lucy greatly. Once she had to stop to rest. But then the long, straight road ahead showed a winking red flame which was a bonfire in the military cordon. It drew nearer and nearer.

"I wonder," said Steve drearily, "if they watch those fires and can see us silhouetted against them?"

The others did not answer. In point of fact, though, if watchers in Newark had seen the fires eclipsed, they would have thought them blotted out by soldiers near by. The trio dragged themselves as near as they dared go. Nick would have gone forward until they were challenged, but Steve would not risk shots at Lucy. He halted quite three hundred yards away. They left the road and Steve had Nick take up a post behind a filling station. The building itself would hide what they might do from Newark.

"Now, it's up to you," he said exhaustedly. "I'm going to rest!"

He flung himself down. He heard

Nick saying to Lucy: "They use lights for signaling in the army. Short-range use, of course. I'll use regular Morse code. It may take a little time."

There was silence for an instant. Steve drifted off toward exhausted slumber.

Nick's voice again: "I'm giving an attention signal. When somebody sees it they'll call a signal corps man who'll flash back to me with another flashlight. Then I can tell them what I please, with no danger of shots or interference by the guys in Newark."

Again silence. Nick was flashing, very patiently, the attention signal in Morse. Sooner or later some one would see it.

Lying on the ground, with every muscle worn out and his brain completely fagged by lack of sleep, Steve went into the comalike slumber of the completely exhausted.

He waked as Lucy protested: "But he's tired! You mustn't wake him, Nick! He needs rest!"

Steve opened his eyes. His head was fairly clear, but his body felt heavy and lethargic.

"What's the matter, Nick? You got them?"

He saw that it was early dawn. The sun would rise at any moment. There were bright colorings in the eastern sky, and the dawn light filled all the world. Nick looked tired and troubled.

"I signaled for half an hour. Then somebody answered with a flashlight. I wanted him not to signal except when he had to, to avoid possible notice from Newark. The light was paling then. I began to give him the stuff as I knew it from you. He gave me check signals twice. He was getting it. Then I finished, and he didn't acknowledge. I can't get any more signals. And—and it's getting light now, and I don't see anybody moving!"

"I told Nick you needed rest," said

Lucy anxiously. "You need to sleep, Steve!"

Steve got to his feet. He stared across the brown grass at the cordon. It was in plain view, now. There was a little group of pyramidal army tents. No one moved in or out of them. No sentry paced. Then Steve saw a figure lying on the ground. He saw another.

He raised his eyes. The light was momentarily stronger. He saw the streets of Jersey City. And—at dawn—those streets were nearly deserted. But Steve saw a few figures. He saw a milk wagon, and the human figures were prone on the sidewalk. The horse which drew the milk wagon had toppled sidewise in its shafts.

Steve stared. Then he shrugged in surpassing weariness.

"Come on," he said tiredly, "we might as well go over."

He started toward the cordon. Lucy caught at his arm.

"Steve! They'll shoot——"

"No," said Steve. "They won't shoot. They're frozen. The 'plague'—the word was all irony as he said it—'has hit Jersey City anyhow. Maybe it's taken New York, too. But it's happened within the past few minutes. Maybe we can do something before Fran's crowd gets organized."

X.

A SENTRY had fallen against a thicket of brushwood, his rifle at right shoulder arms. He looked absurdly like a toy. There were men with unbuttoned blouses in the tent which served as guardhouse; shooting crap on a blanket on a cot. Not one of them had fallen from his position. They looked unreal in part because of the naturalness of their poses.

Steve found the signaler who had been receiving Nick's message. He was seated on the ground, a pencil in his hand, scribbling in his notebook with

his eyes fixed upon the spot from which Nick had ceased to signal some twenty minutes since. A commissioned officer lay absurdly upon his back, his face fixed in a frown. He had evidently been reading the message as the signaler wrote it down.

A little purring sound became audible. Steve moved toward it, the other two with him. They passed a signal-corps truck, parked and with its mast raised and antenna stretched. Nick moved to enter it. Steve checked him.

"Nick! They'll catch your call and scramble your message."

"I know!" said Nick. "But there'll be some dry cells in here. And I'm getting goose flesh wondering when the batteries in my pack are going to give out."

He vanished. A minute or two later he came out with his pockets bulging. Steve had found two men with automatic rifles, evidently in the guard detail on duty when the plague-area extended. The purring noise was that of an idling motor. He indicated the rifles. Nick helped him carry them and a supply of ammunition.

They reached the idling car. It was a khaki-colored Q. M. C. car, a five-passenger sedan. It was empty. Steve opened a door and thrust in the rifles.

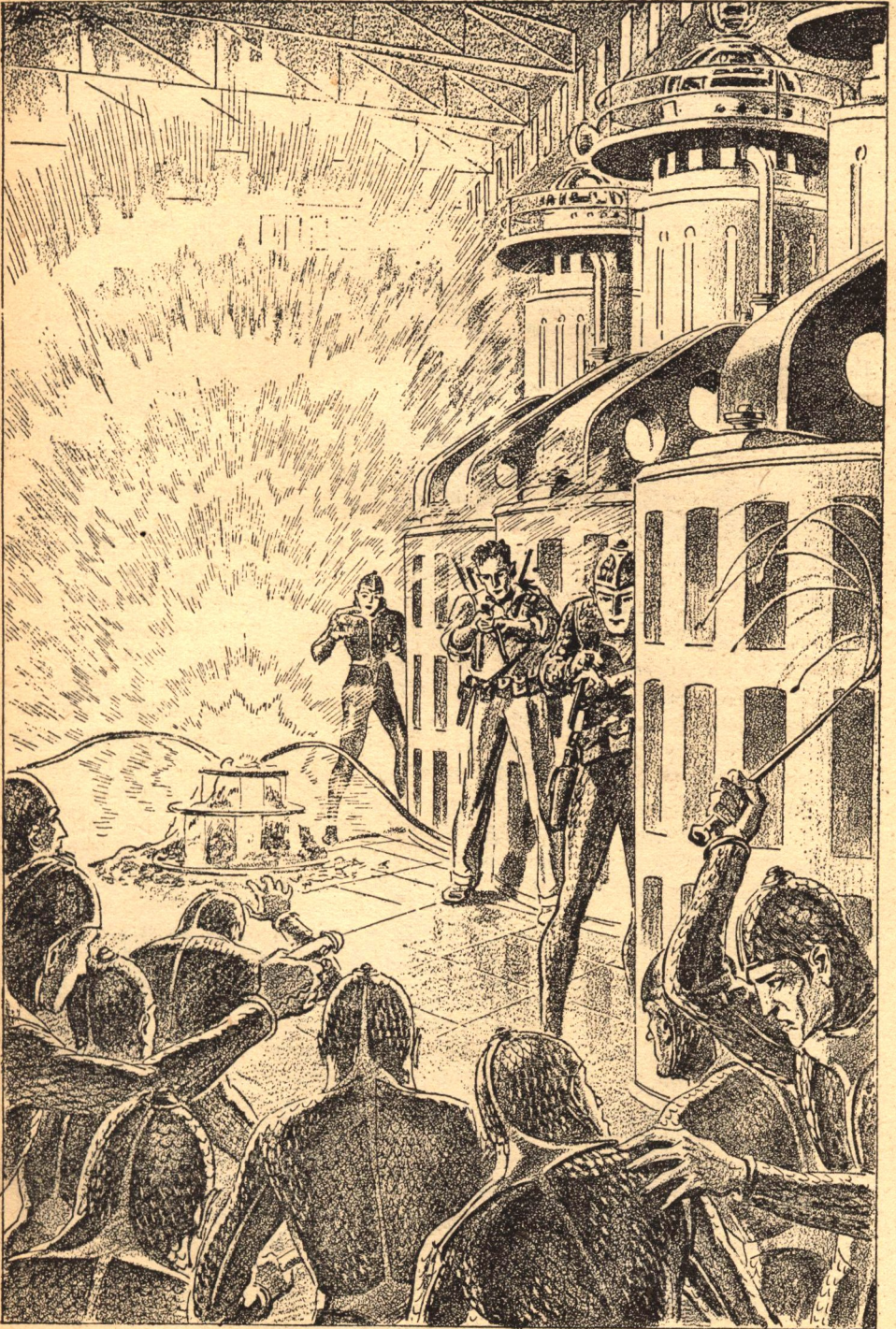
"You can probably clear the rifle to shoot out of some window," he said. "Some extra pistols wouldn't be a bad idea, though."

Lucy moved aside. When Nick came back with three pistols, she had half a dozen complete belts of weapons. She entered the back of the car.

"If there's—fighting," she said, "I'll help shoot, too."

"They can't be organized yet," said Steve. "Only, if they're guarding the mouth of the vehicular tube we'll have to cut and run. Let's go!"

He slid the car into gear. The sun was distinctly up, now. It had been



In the unholy glare of the green flame, Nick and Steve fought savagely—dodging, shooting—

sunrise when they reached the cordon. When they reached Jersey City proper, the tops of all the city's taller buildings were gilded by the sunshine. When they turned off on the boulevard, it was day.

But it was a strange day. Jersey City was utterly still and utterly silent. It was in the same cataleptic trance as Newark. But it did not look the same. Newark had been struck at six thirty in the evening, when its streets were crowded, its trolleys jammed, its highways a-throb with vehicles.

Jersey City had been smitten at five in the morning, when it was a city asleep. Policemen could be seen, grotesquely sprawled on the pavements. Milk wagons appeared, weirdly tilted or toppled over completely by the fall of the horses in their shafts.

NEWARK looked like a city smitten by incredible catastrophe. Jersey City looked like a city depopulated by plague. It was equally strange, but not so gruesome. For one thing, one could drive and not worry—much!—for fear of coming unexpectedly upon a tumbled heap of shattered automobiles, or of feeling one's wheels crunch horribly over something lying in the road—

They swung from the boulevard to the long ramp leading down into the vehicular tube. Quite incredibly, a roadster came slowly up that ramp. Its driver was stiff and stark, staring ahead, with wide-open, sightless eyes. The motor throbbed and labored in second gear. The car, traveling blindly, had edged into the curbing at just such an angle as permitted it to slide slowly forward. It scraped its way, laboring, at the rate of perhaps a mile and a half an hour. The khaki-colored Q. M. C. car went swiftly past it, hovered warily for an instant before the entrance of the tube, and dived in.

The tube was dark. The rows of

glittering electric bulbs which brighten its white-tiled walls were unlighted. The sedan's headlights glared on ahead. They showed emptiness for a long space. Then one of the tunnel police appeared, his legs sticking out absurdly into the roadway as he lay upon the guard walk. An expensive limousine was stalled and emitting dense blue smoke from beneath its hood. They drove through the smoke. It was the reek of hot rubber.

Up and out into the New York of before-dawn, but with golden sunshine playing upon empty streets and closed and silent buildings. It would have been strange to look at, at best. But in the quite impossible silence that hung over the city, it was very much more than strange.

Steve had had some hope of New York. But he saw the ticket-takers immobile in their cooplake boxes. He saw a policeman tumbled to the ground, his hand still upraised in the act of scratching his head. And then he stopped the car—and there was silence. There was no underground rumbling of subways. That is a sound which never ceases in New York. No surface car clattered and banged, however far away, and there was not a motor running anywhere. There was not even the flutter of pigeon's wings, which is a sound quite amazingly characteristic of downtown Manhattan.

There were just empty streets, with piled-up cars both rare and far between, and a stillness which was more than the stillness of night or of the Sabbath—the stillness of death.

Steve even switched off the motor, and there was still no sound.

"We're too late," he said heavily. "Much too late! By the time we could get high-frequency packs made and any number of men waked up and convinced and armed, the Invaders would find us. In empty streets like these

we'll be plainly visible. And I hardly think they'll worry about noise now. If they took over New York they'll have taken over Brooklyn, too. They won't worry about the sound of shots getting out. Nobody is alive within range to hear them."

Nick chewed at his fingers.

"It looks like we're licked," he said dismally. "Damn it, Steve, they'll get us sooner or later. Let's go hunt up those guys and use up this ammunition we've got!"

"I would like to do some damage," said Steve calmly. "They've really got my goat. Look here! This thing isn't half an hour old! They haven't had time to get organized! And if it's only a few minutes old, why—" His eyes glowed suddenly. "Nick! There'd still be steam at the big power plant on the East River. They've got automatic controls on the boilers and stokers over there! Nick! Let's try it! There'll be at least a hundred thousand horse power and—"

STEVE had the car started and in first speed, and was in the act of changing to second before Nick could reply. He raced away toward the east. As they got away from the wide approaches to the tunnel and dived through the narrower streets acrosstown, the uncanniness of the dead city grew more oppressive.

They saw more people, though—an amazing array of shabby human beings turned up, frozen into immobility upon the sidewalks. There were scrub women and janitors, and once a too-richly-dressed woman with a wide, calm forehead. There were bearded men—three of them—fallen beside their empty pushcarts. And once a woman with a gray checked apron, magnificently matronly, lay in the midst of half a dozen bundled-up children, whom for some

inscrutable reason she had been leading no one could guess where.

Down Canal Street they went sweeping past the Bowery, dark beneath its elevated track despite the sunrise, then up, and up, and up in the great sweep of the bridge across the East River.

Down below them, on the water, midget tugs puffed sturdily but aimlessly. Their crews smitten with the Invaders' plague, they would move at random about the harbor until their fires died down or they ran aground. Far over to the left, the multiple chimneys and pale brick bulk of the power house loomed through morning mist. Some smoke still came from the tall and monstrous stacks.

"There'll still be steam," repeated Steve, "but it's pretty probable that we'll run into something. Fran's gang cut off all power to the city, of course. When we go in there, Nick, we'll want to take all our guns."

Now they came to wreckage on the bridge. Cars had met almost head-on and crashed, and from their impact they had swung partly around and blocked the roadway. But some one—spilled gasoline and oil and scratches on the roadway showed it—some one had come along since the crash and shifted one car enough to clear the road again. Which meant that some of the Invaders had crossed the bridge since the city became a dead spot.

Steve noted it, and probably Nick, too. Nick, at any rate, very painstakingly put fresh batteries into his high-frequency pack, and began to sling extra pistol belts about himself until he looked rather like a harness rack. He got one of the two automatic rifles ready to use.

Down the sloping other side of the bridge, they sped to the left and swiftly through streets which were mercifully clear—not altogether clear, of course, but nearly so. Steve gave private thanks that New York and Brooklyn

had been struck before dawn, instead of during the hours when traffic was heavy. These streets were narrow, and had there been piles of débris and mounds of stiffened people, he could not have passed.

As it was, he drove swiftly up to the power house. He coasted—for silence—into the great doorway through which maintenance trucks and such things normally had egress. The car slid to a soundless stop.

HERE the air was not altogether empty of noise. There was an indefinite but sustained humming sound, once a faint, mechanical clanking. Steve slid open the door beside him and got down. He motioned for Lucy to give him one of the automatic rifles. He took it, and extra supplies of shells for it. Nick got cautiously out on his side.

"I don't hear anybody," said Nick in a hushed tone, "but there must be somebody tending the machinery."

His voice echoed cavernously. Lucy stepped to the ground, a quaintly brave and exotic figure in the armor and helmet of the Invaders, yet with the most familiar of weapons slung about her waist.

They went cautiously into the power house. They found the boilers, long rows of insatiable maws to be fed with coal. Here and there the red glitter of their fires came through the front of the furnaces. They saw men here, too, toppled to the floor and frozen in the poses of the moment when the plague struck. One figure lay before the door of an open furnace, and the fire glaring out of it seemed to scorch and shrivel him. They saw no moving figures.

They went to the generator room, in which the hum of many dynamos was clearly audible. The room was monstrous in size and the machinery was gigantic, though not in proportion to

the power it developed. And there was no moving figure anywhere. The only attendants were small, stiffened figures in blue denim, scattered among the generators. And even alive they would have seemed too puny to handle such monsters.

Steve feverishly traced bus bars and power leads. He followed them across the huge hall to the main switchboard, with its maze of glittering conductors.

And there—dwarfed by the sheer size of his surroundings—he said: "The master switch! Somebody threw it! Nick!"

"Right!" said Nick. "We'll want some sheet metal for condensers. We ought to have platinum for the points, but we haven't got it. Nobody has enough for what we want! So we'll build us a flat arc, with crushed porcelain to make walls around the metal when it melts. I think we can use a two-inch gap, Steve."

"Right!" said Steve in his turn. "You get to work on the gap. I'll hack off some bus bar and get tools and sheet metal. Lucy, stand guard."

Lucy climbed to a high walk where she could see every entrance and exit of the huge room. She did not understand what they planned. They had spoken of steam and boilers and horse power by the hundred thousand, of condensers and gaps and melted metal. They seemed to refer with full comprehension to some fully matured plan at which she could not even guess. But Lucy had come to have an extraordinary confidence in Steve. Women do have that confidence in men they intend to marry. And all Steve's failures up to date did no more than fill Lucy with resentment because factors beyond his control had brought his plans to nothing.

Nick knelt on the floor, hammering porcelain insulators to bits and building the fragments into a mound such

as children build on the seashore with sand. Then there was the sound of blows upon metal and Steve came back with ten-and fifteen-foot sections of shining, square bus bar. He staggered under their weight. Nick grinned at him and bent them into desired shapes by inserting them in parts of still machines and heaving on the ends.

Steve came back with more bus bar. He disappeared once more. Lucy watched. Once she thought she saw a movement through one of the open windows, but she could not be sure.

"It's all right," said Nick, when she told him. "We'll either win or lose this time, and no draw is possible. Let 'em look!"

THERE WAS a shot, then two more. Nick sprang to his feet and ran for the sound, tugging with both hands at the apparently innumerable holsters dangling from his body. Lucy turned white and darted for the steps to the floor.

But Steve came into the huge room, dripping big sheets of thin sheet metal as he came.

"Only one man," he said calmly, "and I killed him. But we'd better hurry. Nick, are these all right for your condensers?"

Nick grabbed them.

"Get me some panes of glass from the windows. Big ones!"

Steve shattered a windowpane and strained at the muntins which held the others. Lucy carried the glass to Nick. He built up highly improbable condensers, sacrificing capacity, neatness and efficiency for speed and a reasonable chance that they would not arc. There were only two plates to each condenser, but they had to do.

A man in the scaly armor of the Invaders stormed into the huge room. He carried one of the canelike whips

with metal studs that Steve had seen on Market Street, in Newark. He saw Lucy first, and Lucy looked like one of the Invaders herself. He rasped a savage and wholly unintelligible sentence at her.

Steve shot him dead with one of the automatic rifles and said: "Better speed up, Nick."

Nick worked like a madman. Two more men dashed in. A burst of shots brought down one. The other tripped over him and fell. But he saw Steve and screamed, in the cryptic syllables of the Invaders' speech. He crawled behind a dynamo and continued to scream shrill warning.

A man poked his arm around a door. A queer, pistollike device was in his hand. It looked familiar to Steve. But, very quaintly, the man used the door as a shield instead of the sturdier building wall. Steve filled the door with holes, and the man with lead. The pistollike weapon dropped to the concrete floor, heated up, and melted.

There were running footsteps and babbling voices.

"Watch the doors on that side, Lucy," said Steve.

Nick stood up, panting.

"I think I've got it," he wheezed. "I think so!"

He ran to the great master switch. He jammed it home. There was a flash of blue-white flame, then another, then a harsh, unbearable glare.

Nick had built a sort of flat-topped mound very much like a sand castle on the concrete floor. It was made out of pounded porcelain insulators, and its top contained two shallow depressions filled with scrap metal and separated by a dyke of the pounded stuff. To each of the depressions ran one of the huge bus bars, and the two heaps of metal were temporarily connected by thin scraps of fine wire.

With the switch thrown, sixty-six hundred volts of electricity, and nobody knows how many amperes of current, tried to go through the tiny, temporary connections. They heated and exploded—and started a giant arc. The current leaped between the two heaps of scrap metal.

At first the arc was blue-white. Then it became tinged with the ghastly hue of vaporized copper. It threw an unbearable glow, an intolerable glare, upon the ceiling. The heaped-up scrap smoked fugitively and then began to glow a dull red. In seconds it was white-hot. It verged upon blue-white and abruptly slumped down. Blocks of incandescent copper melted down into more than incandescent pools on either side of the central dyke of powdered porcelain.

ON THE FLOOR of the great generator room there flared an electric flame like the surface of a blue-white star, smoking, flickering, crackling, spitting—

Men in scaly armor flung their hands before their eyes and drew back, fearful of what seemed to be unfamiliar to them. Harsh voices from shelter lashed them on. But Nick and Steve set grimly to work with their automatic rifles.

And then noises began in the city outside!

The sixty-six-hundred-volt arc was, of necessity, a producer of high-frequency current. The condensers Nick had improvised served after a fashion to increase that output. The arc itself, as far as the power lines were concerned, was a resistance which cut down the voltage reaching power transformers and hence the voltage reaching lamps and motors. But that was all the damage done to the power lines. The benefits were greater.

The inductive capacity of the line was

—naturally—high. Its resonance period was far below radio frequency. Surges of high-frequency but not radio-frequency current went out through all the feeder lines of the city. Automatic switches cut in the lines normally allotted to the other power houses, and automatically synchronized alternators cut in the enormous reserves of storage-battery power to take care of the unquestionable failure of the dynamos to hold up their output with untended fires.

Every feeder line in the city became filled with the mighty surges of high-frequency current of the period dictated by the capacity of the lines. And every human being in the city had small, high-frequency currents induced in his body!

There were many, many thousands of horse power in the arc now flaming between pools of melted metal. There was more power in the arc, producing high-frequency current, than in the apparatus which had thrown some millions of people into a cataleptic condition. And trivial as was the current induced in each person in the feeder lines' field, it was enough to neutralize the paralyzing force and something over. It was enough to start the process of revival—and finish it!

The life in the city had been that of before-dawn. But New York and Brooklyn are not silent at any hour. And there had been many clocks set for alarm in the hour during which the city had slept. The sunlight wakened many more, because to sleepers who had been "frozen" as they slept, their revival brought daylight into their eyes with the seeming suddenness of the turning on of an electric switch.

All over the city, by thousands, men and women started awake. By other thousands, people saw smashed cars and other signs of catastrophe and hastened to report them. Some few even guessed what had happened to them, from the

fact of finding themselves suddenly tumbled upon the ground. Rather quaintly, it was the occupants of the plague spot about the Mayfair Hotel who raised the greatest commotion. They were fully dressed and upon the street. They saw condensed catastrophe about them in the wrecked cars of what—at that place—had been mid-morning traffic when the plague spot came into existence. But the rest of the city made commotion enough.

The noise came even into the power house, and Steve and Nick Bannerman heard it in between the cracklings and roarings of their own guns. The Invaders attacked with a queer helplessness, driven on by whip crackings and raging voices behind them. They did not know how to take advantage of the cover of the machines. When, presently, they began to use firearms they were clumsy and unskilled in their management.

THE GREAT HALL rang with the roaring of the automatic rifles, and with the poppings of revolvers. Nick and Steve defended their unholy flame with insensate savagery, while noises grew in the city about them.

A bedlam arose upon the river. Tugs and steamers found themselves suddenly violating all rules and customs of navigation. They got their high-frequency current through the fact of earth return to the power house. They whistled furiously at each other to straighten out the tangle in which they found themselves. Those which had collided with each other or had run aground, or had rammed the docks which lined the river banks emitted the mournful, wailing blasts which called for immediate assistance. There were frantic ringings of engine-room bells, the hectic blowing of whistles, and the deep-toned groan of fog horns. In combination, the water fronts made a

tumult which would wake New York and Brooklyn from slumber.

But there was more. Policemen everywhere found themselves prone upon the ground. They scrambled to their feet again to see wreckage all about them—crashed cars, smashed windows. Their whistles shrilled. They raced to their beat telephones to report tragedies, or else competently smashed in the doors of the nearest stores to call ambulances with the minimum loss of time. Police whistles alone would have waked New York.

And then there were the other sounds. Between the time of the coming of catalepsy and the time of the shutting off of power to the city, the elevated trains had run wild. Three cars of the uptown elevated lines had jumped their tracks at curves and buried their noses in convenient apartment houses. There was a rear-end collision in midtown, with splintered cars flung sidewise of the entire elevated structure, and one car dangling—very much like a link of sausage—almost to the ground. Trolleys at Columbus Circle had gone amuck and one was jammed in a subway entrance as if it had become panic-stricken and had tried to take refuge below ground.

Downtown, the East Side el had made a shambles of a tenement house where Delancey Street crossed it. The tools of a repair crew on the track were responsible for that. And all of these tragedies produced calls for ambulances and for fire engines, whose screeching progress through the streets waked up any human beings yet unaroused.

And besides these things, there was Brooklyn. And, if possible, in Brooklyn conditions were worse. There were elevated lines in Brooklyn, too. There was, at this early hour, considerably more automobile traffic than in Manhattan, especially along the traffic routes into Manhattan. A bedlam arose in

Brooklyn composed of human voices screaming, and sirens shrieking, and bells clanging. It joined to the bedlam of New York, wherein ambulances and growling subways and police whistles and much greater shrieking made another din. All joined the water fronts, which were a monstrous, braying, bellowing ululation.

There was uproar everywhere—save above a Hundred and Tenth Street in New York, where the feeder lines Steve and Nick had charged did not run. An irregular boundary remained there, between the quick and the seemingly dead. But elsewhere—

Elsewhere New York cried out tumultuously.

STEVE AND NICK fought savagely. They dodged about among the generators, sending bursts of shots at every attempt of the Invaders to get enough men inside the great room to overwhelm them by sheer numbers. The attackers were of that cringing, cowed class Steve knew as Underones. They were not good fighting men. For leaders to remain safely under cover and try to threaten their men into bravery does not bring out the highest type of combativeness, somehow. So that Steve and Nick held the space about their ghastly green flame. It flickered and flared and filled the great room with an unholy glare. The crackling echoes of shots stung their eardrums. The light blinded their eyes when they glanced at it.

Lucy had climbed aloft again and from her observation post called down warnings of other attempts to gather and to rush. The dynamos hummed and hummed. The two men fought des-

perately, and even more desperately wondered when this uproar would bring police and, consequently, help to them—and the police worked like madmen to cope with the emergencies they knew of, and did not dream of this.

Then a pilot light went out, before one of the giant generators. Then another, and another. The droning sound of the dynamos had been a steady, throbbing hum. It became a fainter sound. It degenerated into a whine. The whine grew fainter. More pilot lights flicked out. The ghostly blue glare wavered. It was running exclusively on the great banks of storage cells now, and they had been drawn on heavily for a very long time.

Guns continued to crackle, but the arc which leaped between pools of melted metal grew unstable. It wavered more and more erratically. Then the same hands that had cut off steam from one turbine after another found the switch to the battery banks.

The arc went out.

The noises in the city stopped. The shrieking of sirens cut off to the sound of so many crashes. The whistles upon the river died away, save that far down toward the Battery one lone boat wailed on, and on, and would so continue until the steam in its boiler was finished.

"They cut off the steam from the boilers," said Steve in icy calm. "The city's gone dead again, Nick. But it was a good try, anyhow!"

There came another sudden rush of men. This time some of their Leaders followed them, striking with their whips at the men who were to do the actual fighting. There was the courage of pure desperation in that rush. Revolvers crackled in the front rank.

To Be Concluded.

The Thought Web

*He was free! He could cruise from sun
to sun—from planet to planet—until—*

by Chan Corbett

JOHN WEATHERBY walked down Broadway at his normal gait—that is, neither too slow nor too fast. It was five thirty in the afternoon, and the famous thoroughfare was crowded with home-hurrying New Yorkers. Another block, and the subway would yawn for his slightly stooped, inconspicuous figure as it had done on innumerable days before. His mind was blank of thought or emotion; vaguely concerned only with traffic lights and jostling passers-by.

Thirty-odd years of bookkeeping was not conducive to bold or original thoughts, nor was the prospect of the tiny home in Astoria, well encumbered with mortgages, his stout, somewhat careless wife, his three spoiled children, the inevitable Monday corned-beef hash that always followed the inevitable Sunday corned beef and cabbage, particular excitants to eager hastening. In short, his mind was—well—a blank, a prepared palimpsest on which former writings had faded to an indistinct gray; a mind in which any forceful outer impulse would have but little difficulty in finding lodgment.

The subway was but a block away. Once inside, sheer instinct would guide his habituated feet through the open door of the Long Island train, would emit him at the proper station, and return him to the bosom of his family. He kept on walking.

THE great science web of Minipar glistened with the quivering bodies of

thousands of onlookers. They clung with jointed legs to the outer periphery, to the innumerable spokes and interlacing columns of the famous science web; great, faceted eyes directed toward the common center; hairy, segmented bodies tense with excitement.

The most important scientists of Minipar were gathered in concentric rings at the central interlacement to watch the repetition of an ancient experiment. The fierce green light of binary suns beat down on the angular surface of Minipar, picked out in shining detail the science web that flung its gleaming strands from pinnacle to pinnacle. Other webs, for stored food, for mating periods, for contemplative solitude, for growth and thought transference, dotted the vast, rock-tortured landscape. Long, thin strands flung their slimness across the voids for swift intercommunication.

Heurilu felt himself the cynosure of ten thousand eager eyes. He sat at the very pith and core of the science web, his eight segmented legs trying hard not to tremble as they rested on the raised platform. A web of glistening crystal strands enmeshed him close. He knew that swift currents leaped invisibly through the slender threads in closed circuits, ready at the word to interpenetrate his being.

Korm, the chief scientist of Minipar, and director of the experiment, gazed inscrutably from his bulbous, faceted eyes. "Surely you are not afraid, Heurilu?" he rustled softly.

The young volunteer stiffened his

of Minipar



trembling legs, spoke as scornfully as he could. "Of course not. Fear does not belong to the sons of Minipar. In the cause of true science no one must falter."

The great web swung and danced with responsive applause. It was a proper answer to have made, worthy of a Miniparian. But inwardly Heurilu raged at himself, at the uncontrollable quivering that made him sway on all eight legs. He *was* afraid! Afraid of this experiment, afraid of the far-distant unknown to which he would soon be transferred, perhaps never to return. There had been cases like that.

Korm's eyes softened. "It is a brave thing you are doing, Heurilu," he rustled. "Poor Zel never came back. His body still wanders the strands of Minipar, but an alien entity—a disconsolate, uncomprehending spirit from a hidden galaxy across the universe—inhabits his proud, and erstwhile shining form."

A whispering moan arose from the spectators.

"It was with the utmost difficulty," resumed Korm, "that we were able to study the dim thought processes of this inferior being. He comes from a tiny globe that revolves sadly about a modest single Sun. His race knows but little science, their life spans are but pitifully short. His body is a stunted, awkward thing—a shapeless mass of soft, defenseless flesh, with two short legs that move with dreary slowness, and eyes of simple semiblindness that detect only a narrow band of the visible spectrum. Worst of all, these low forms of evolution must depend on the outer elements of their world, painfully excavated and more painfully fashioned, for the low-grade machines of their limited science."

A shudder passed over the audience.

HEURILU straightened himself, held his sensitive antennæ erect. "I realize the dangers of the experiment," he said very low. "I know that I, even as poor

Zel, may be condemned to inhabit a transitory, indescribably ugly form in a remote corner of a distant universe, but I shall not flinch. Martyrdom in the cause of science is a noble doom. The knowledge of Minipar must be extended beyond the bounds of the visible universe. We must study and examine these strange life forms that inhabit the reaches of inter-galactical space. Even if the immortality that is mine should darken within the limited flesh of an alien being, I shall not draw back."

Korm's antennæ caressed him gently. "You are a true son of Minipar," he approved. "You may rest assured that all the mighty science at my command will be invoked to bring you back safely across the gulf. The case of Zel was an unusual one. Somewhere, in the space threads of transference, contact was snapped, condemning him to a lowly, dreadful fate, leaving with us this alien, limited intelligence in the body that once was his. It shall not happen again."

He turned to the clinging scientists. "You see," he explained, "the transference is a delicate process. Pure thought, the motivating impulse that clothes the universe in visible form, is an enmeshing web of infinite strands, bound by no finite circumscription, obeying the laws of material relativity and limiting speeds. Tiny, residual threads of the universal thought inhere in our beings—call their limited complex our spirits, souls, if you wish—and create the entity that is us. Similar segments, grosser, it appears, and clouded by the enveloping brute forms, inhere in all the manifold life forms that spawn the endless universe. That is not to say," he added with a little rustling chuckle, "that there may not be somewhere, somehow, beings of a superior order even to ourselves."

Amusement rippled over the antennæ of his listeners. Korm always had been a modest fellow.

"These strands," he continued, "being but part of the universal web, it was

comparatively simple in theory, if not in actual practice, to induce, by synchronized vibrational beats, an opening of the thought synopsis, a surge of being along the interrelated web that spans the void, and an induction into the residual termini that inhabit another bodily form in an alien universe."

Heurilu kept his voice steady. As the subject of the experiment he had a right to know. "Is it possible to direct the transference to a definite segment of the universe?" He shrank from the possibility that he might find himself on that minor planet of a minor single Sun, clad in a bestial body similar to that in which poor Zel was condemned to a brief mortality.

"That," acknowledged Korm, "is impossible. We have no way of determining into which of the infinite number of thought strands that encompass the void your particular entity will be projected. Only when the rebeat of the vibratory impulse brings back into the induced vacuity of your body the dispossessed thought spirit of the alien form, and it is examined in the thought analyzer, are we able to determine to which particular area you have been sent.

"But do not worry," he added hastily, "the connecting strands maintain a higher difference of potential because of the induction transference; and a reversal of the current at this end reverses the entire process. There have been no mishaps on *that* score."

Heurilu thought of Zel and dozens of others, doomed to incredible exiles, and smiled wanly. It was better, no doubt, to think only of the many hundreds who had volunteered for the mighty experiment, and returned, none the worse for the tremendous experience, brimming with strange tales of the far reaches of a universe of infinite variety.

"I am ready," he said quietly.

Korm nodded, spraddled stiffly on all eight legs. A long black antenna contacted a nodule on the inclosing web.

The assembled spectators clung feverishly to the great science web, straining, hissing their excitement. Blinding green flashes played over the crystalline threads, hid the hairy, segmented body of the dauntless adventurer within.

AN imperceptible tremor rippled over the form of John Weatherby. His stooped shoulders straightened a trifle; his eyes, dulled with the weary round of humdrum toil, stared with a new incomprehension at what should have been the thrice-familiar scene of Broadway. The Sun gilded the tops of the midtown towers; fantastic figures danced in daytime static array along blatant advertising signs; autos crawled fender to fender, honking feverish horns; the sidewalks were black with hurrying humanity, and midstreet with agile, dodging jaywalkers; policemen, red-faced and angry, bawled raucously at motorists and pedestrians alike—in short, New York!

But John Weatherby stumbled over feet that suddenly seemed not his, found difficulty in coördinating muscles, glanced with fresh astonishment at Sun and lofty towers and his fellow men. Mechanically, his legs carried him along, up to the very mouth of the subway into whose depths for years he had plunged exactly at five thirty-two each afternoon.

This eventful day, however, there was no break in his stride, no side swerve. He kept on walking—

Stout Clara Weatherby slapped a pestering urchin with one broad hand, yanked viciously at the handle of the oven door with the other for the dozenth time. The corned-beef-hash, *pièce de résistance* of the evening meal, was not only brown; it was positively scorched.

"You hush up, Junior," she snapped. "I'll slam you if you keep up that caterwauling. I know you're hungry. So'm I." Her lips compressed in a tight, ugly line. "Wait'll I get my hands on that good-for-nothing father of yours. He should 'a' been home an hour ago." She

sniffed. "Him gallivanting around, I'll be bound, while his poor family worries themselves sick, and starves into the bargain! Let him just wait!"

At seven thirty her muttered threats had become open outcries, in the course of which the neighbors, both near and far, were regaled to juicy titbits in the former history of the unoffending *paterfamilias*—a history, which, by eight o'clock, when the shorn family finally sat down to burned hash and stale coffee had extended backward into the unsavory antiquity of the still missing head of the family's relations, near relations, and forbears.

By nine o'clock Clara Weatherby was still declaiming volubly to a sympathetic circle of similarly slattern women, released from their evening labors by the accustomed arrival of their lords and masters. By nine thirty some one conjured up a dramatic vision of hospital and morgue, with appropriate gory details; whereupon Clara promptly fainted. At ten the police were notified, and a tracer issued by the bureau of missing persons.

But John Weatherby was gone, vanished, swallowed up in the great unknown.

IT WAS not until two days later that John Weatherby, or what was indubitably the form and lineaments of John Weatherby, was taken into custody within the precincts of one of the plants at Schenectady. A slight, inconspicuous man, gray at the temples, stooped of shoulder, had haunted the vast reaches of that mighty plant all morning staring at the great dynamos, watching the endless winding of armatures, observing the manufacture of electric-light bulbs, without remark from the busy workmen. But when he penetrated the research laboratories the stranger was accosted, and his business demanded. He answered with a spew of thick, unintelligible sounds. Whereupon the police were

called, and recognized in the intruder the missing man.

He was brought back to New York and confronted with his wife. That lady promptly cast fleshy arms around the spindly neck of her erring lord and master, mingling copious tears and voluble language in equal proportions. But John Weatherby stared at her with blank and repellent eyes, disengaged himself hastily, and, with a certain distaste, from the smothering embrace. He made certain sounds, which were neither human nor animal, yet somehow indicative that he neither knew the lady formerly, nor, if the truth must be told, did he wish to make her acquaintance now.

They brought his three children before him, striving vainly to excite the recognition signals in his wandering brain. He stared at the three offspring, dressed hastily in their Sunday best, faces for once clean-scrubbed, listened to their shrill pipings: "Daddy! Daddy!" and turned away with that same pitiful attempt to coordinate speech muscles to the uses of recognizable sound.

"A clear case of amnesia," said the police wisely.

"Right!" agreed the doctors in the hospital to which he was finally removed.

Dr. Lionel Gruening surveyed him with interest. "Rather unusual affair," he told his assistant. "For once the popular term of these impairments of memory is correctly used. The ordinary case of complete forgetfulness of the past is really an aphasia, in which the patient is able to begin a new life with unimpaired faculties from the date of the hiatus. The case of John Weatherby, however"—and he turned interested eyes on the patient—"is in fact that rarer form, a true case of amnesia, in which not only is the former personality forgotten, but the victim has also lost the power of intelligible speech or hearing."

"A blow on the head," said the assistant confidently, with the brashness of the young. "It affected not only the

memory areas, but injured the motor speech areas as well."

Dr. Gruening did not answer immediately. His eyes clung with a strange, far-away look to the meek-appearing figure of John Weatherby. That worthy was sitting quietly in his chair, his eyes curious, alert, drinking in the details of the hospital, the cabinets of shining instruments, the artificial lighting, even the white smocks of the doctors themselves, with a fresh, greedy avidity, as if he were storing up new and strange sensations against a future day. John Weatherby, the former, had never, in forty-eight years of existence, looked upon the world with such a frank awareness.

"Your diagnosis," commented Dr. Gruening finally, "is, of course, the standard and accepted one. But I sometimes wonder. There is such a complete severance of personalities, and such an obvious inability to speak the language of human beings, though definite sounds can be formed without difficulty, that it has struck me before, and in this case, with even greater force, that there might be another, a very fantastic explanation in back of the phenomenon.

"Who knows but that the medieval idea of the insane being inhabited by devils may not have a certain substratum of truth! Perhaps beings of another planet, or another system, are farther advanced in science and the study of mental phenomena than we are: perhaps they have even accomplished the difficult task of thought transference; or an even greater task, that of the transference of personalities across the void.

"We are ourselves only on the threshold of the study of the mind and its processes. Perhaps amnesia cases, with their awareness of Earthly conditions and speech, without any memory of their former existence, may be, in fact, alien personalities transferred into the repositories of human bodies. Perhaps——"

In his growing excitement Dr. Gruen-

ing had forgotten he had an audience. He looked up in time to see his assistant staring at him as if he, the famous psychiatrist, had suddenly gone crazy. He stopped short, bit his tongue, and muttered a confused apology. He had his reputation to consider.

JOHN WEATHERBY felt strange. There was something wrong with him, but for the moment he could not localize the weird sensation. He had been walking on Broadway, intent only on reaching the subway, following the accustomed groove of years, when there had been an attack of dizziness, a fainting spell, a sudden blinking out of Sun and streets and people. His heart, no doubt—the doctor had long ago told him it was not functioning properly.

But the attack had evidently passed quickly. He was quite all right now. Lucky that he hadn't been run over in that momentary darkness.

But was he all right? His brain was unclouded—singularly unclouded, in fact—but obviously he was suffering from hallucinations. For, as he opened his eyes, he found himself gaping at a scene of incredible nightmare, a scene such as he, John Weatherby, even in his wildest, most unbuttoned dreams, had never dared to imagine.

A vast, incredible landscape stretched before him, interminable, alien. Jagged pinnacles darted tremendous distances upward into a virescent bath of vibratory light, themselves black and needled. High overhead, two strange green balls of fire moved slowly about each other in majestic orbit. Then, suddenly, John Weatherby screamed. At least he had tried to scream. But a thin, rustling sound was all that he could emit from a mouth that was curiously stiff and alien. He had seen the monsters of this terrific nightmare. They ringed him round, spraddling with swaying, jointed legs on what seemed the strands of a gigantic spider web.

Their hairy, monstrous bodies were those of magnified spiders, their black, chitinous jaws champed with rustling sounds queerly like those he himself had just emitted. Their huge, faceted eyes glared at him with a speculative luster, just as though he were a strange specimen brought to them for scientific examination. Far beyond them, to his horrified eyes, were webs on webs, of tremendous size, huge as all New York, stretching in endless array to the uttermost limits of vision.

He tried to fling himself backward, to escape this vision of his own contriving. Sharp, stabbing pains lanced his brain. He was jerked back by immovable bands. His cowering gaze went upward, saw the tough, gleaming strands that jutted inward from the spokes of the web, disappeared seemingly into his own head. He flung himself forward with a thin, rustling cry. Pain blasted through him.

"Oh, Lord!" he moaned. "Make me to wake up, in my own bed. I know this is only a dream. It's that damned corned-beef hash. I've told Clara time and again——"

For the first time he saw his legs. There were eight of them, incredibly thin and jointed, blackly hairy, clinging desperately to the swaying cradle of the enmeshing web. He screamed again—and fainted——

Dr. Gruening said to his assistant: "Give him another hypo. Perhaps the sedative, a period of induced sleep, will relieve the pressure on the affected areas of his brain, bring back speech and memory."

The glistening needle plunged. John Weatherby slept. But the psychiatrist was not so sure. The number of such cases had multiplied recently. There was the case of Edward Gore, for instance, similarly attacked. The most that medical science could do had not availed. True, the speech faculty had gradually come back to normal, and

Gore had learned to talk again, but only as a child learning a new language. Gore professed no memory of his last life, though he had been a biologist of attainments. Furthermore, the new Gore was strangely reserved, unwilling to talk, to lay his soul bare, so to speak, to the expert offices of psychiatrists and psychoanalysts alike.

Yet his brain had been sharpened, made more razor-keen, by his lapse of all former memories. More, all of his traits, characteristics, had changed. Mechanical contrivances interested him most—railroads, bridges, airplanes.

Gruening stared speculatively at the sleeping John Weatherby, who had once been a routine bookkeeper, a mere minor cog in the vast wheel of human affairs. What manifestation would the course of the disease—if it *were* disease—take in him?

JOHN WEATHERBY awoke from his faint to find himself bathed in an orange glow. It penetrated his being, insinuated itself gently into the remotest corners of his brain. His faculties expanded, basked in the grateful warmth.

He knew now where he was. The monstrous spiders who ringed him round, watching him as though he were a curious animalculæ under the microscope, were no longer strange. Their mandibles opened, spewed forth dry, rustling noises. But now he understood them. They were words, familiar to him as though they were the bones of his native English.

"You have awakened, stranger from an alien universe," the largest of the spiders said, "within the bath of the thought analyzer. I am Korm, chief scientist of Minipar, mightiest planet of the galaxy. We have brought you along the thought threads of the void to inhabit the body of our fellow, Heurilu. He is now within your form, treading disconsolately the paths of your native

unknown planet, an exile in the cause of science. Tell us your name, and from what corner of the universe you come."

The bookkeeper stirred, reared fumblingly on his eight jointed legs, and answered through stiff, chitinous mandibles. "I'm not sure I understand all you say," he rustled haltingly. "This talk of planets, thought threads; what not, sounds crazy to me. I'm John Weatherby and I want to go home. Yes," he added as an afterthought, "even to Astoria and Clara. She's my wife, you know," he explained lamely.

"You can't go home yet, John Weatherby," Korm told him. "Later, when we have received all the scientific information you can impart to us, you shall be returned. Poor Heurilu will be waiting impatiently for the rebeat of the thought strands. Now answer our questions. What manner of planet do you inhabit? What is the nature of your civilization, if any? What knowledge of the universe do you possess?"

The Miniparian who had once been Heurilu, and was now John Weatherby, gasped feebly. These were questions it was almost impossible for him to answer.

"Gentlemen!" he protested incongruously to these huge enringing spiders. "I am only a bookkeeper. I never troubled my head with matters like that. You see, I left school before I finished the grades. I had to make a living. All that stuff you're asking me about had nothing to do with bookkeeping. All I had to know was to add figures properly and write a fair hand. Thank Heaven I was able to raise a family and own my own home without bothering about all that bunk about science and philosophy and what not."

Korm stared at his fellow Miniparians in amazement. If what he had told John Weatherby was slightly incomprehensible, what John Weatherby had just told *him* was even more baffling. His

antennæ gesticulated with excitement and a certain contemptuous disgust.

"What!" he exclaimed. "You lived what you call a life without pondering on scientific matters, without troubling to gain for yourself even the limited awareness of the universe about you that was available to your fellows?"

Weatherby reared higher on his jointed legs in some bewilderment. "Of course!" he answered defensively. "What good would it have been for a bookkeeper to know what some nut thought about Mars and Venus, for instance? Suppose I *did* find out that people lived on Mars, or that they had canals. (He was rather proud of this; only the Sunday before his strange metamorphosis, the magazine section of his favorite Sunday newspaper, had run an article, with illustrations in color, captioned, "What Chance Would Even A Martian Have Against A Gorilla?") My boss wouldn't have given me a nickel more salary. You don't know my boss. He's suspicious of fellows that read books. He's a self-made man, you see."

THE COUNCIL of Miniparian scientists rustled softly. For all their efforts and labors, for all the brave adventurings of Heurilu into the unknown, their web had brought this poorest of specimens out of the illimitable ocean of space. Never, in all their experiments, had they found such a primitive, barren intelligence—not even the last one, in whose behalf poor Zel had been martyred to a hideous doom.

Nevertheless, they did not give up, but went to work. Patiently, they examined John Weatherby's thought processes, sought out all the meager information that he possessed. To their great astoundment they discovered that by some freak of chance he, too, was a denizen of that inferior, remote planet called Earth, in a universe a billion light years away from their own.

This discovery created a sensation. For it meant two things: First, that the thought channels of the void made a synapse with that tiny primitive world; second, that Heurilu was now walking Earth in the monstrously deformed and inefficient body of a human being, subject to accidents, pain, and brief mortality, even as the doomed Zel. Which led to a third consideration which caused them to hasten their studies. If the strand of transference had snapped along the line of Zel, might it not happen as well to Heurilu?

Slowly, John Weatherby grew familiar with his new form and being. Korm conducted him along the webs of Minipar, expatiating on their civilization, their mode of life, their immortality, subject to no pain, no disease, no accident, discoursed to him on the wonders of infinity, the marvels of the galaxy, as well as the strange variousness of outer universes.

At first Weatherby had been horribly homesick. Even the homely smell of cooking corned beef and cabbage would have been ambrosia and nectar to him. The slattern features of Clara softened, became idealized in his memory. His three children swiftly grew angelic wings, and even the heavy jowls of his boss took on a certain nostalgic glamour.

It was difficult, too, to think of himself as a gigantic spider, a creature of eight legs and hairy black body. Gradually these things changed.

The fascination of swift locomotion along the swinging webs of Minipar grew exhilarating; his faceted eyes drank in new colors, new sights invisible to petty human eyes. He could leap from the loftiest pinnacle, secure in the endless cable that spun from his pointed rear. The binary suns overhead were an endless source of delight.

And when, under the tutelage of Korm, he finally evolved from his own body a spun machine that could trap

etheric waves in the intricacies of its mesh, and harness them to mighty uses, his exultation knew no bounds. Every day he learned something new, something infinitely thrilling. The bovine bookkeeper was fast on the road to becoming a philosopher, an ardent searcher after truth.

With this inner change came a different orientation of past consciousness. Korm became a beloved teacher, a kind friend. Weatherby no longer thought of him, or of the other Miniparians, as monstrous spiders. Somehow their forms were normal, proper, more graceful, more efficient, more beautiful in every line than the hideous body of John Weatherby, Earthman, which, most fortunately, he had discarded. He tried to hide its very memory, along with the memory of other things on a dim, half-forgotten Earth which now seemed sordid and repellent.

Meanwhile the Miniparians were completing their researches into the physical constitution of Earth and the mentality of its inhabitants, as they glimmered dimly in the consciousness of John Weatherby.

"BUT, DOCTOR," implored Clara, her rouged cheeks streaked with crying, "you've got to do something to get John out of this state of his. He's just being stubborn, that's all, refusing to recognize his own wife. Me, that slaved for him all these years, worked my poor hands to the bone to make him a comfortable home."

The recalcitrant Weatherby sat comfortably in his chair, viewing her with a most unusual sardonic amusement, seeming to study her as if she were some new species of spider. He was gradually regaining his speech, though, like Edward Gore, English seemed to be a new language that he must master. He was surveying everything with that sardonic air, thought Dr. Gruening to himself.

To the bereaved wife he said gently, "It is not that he refuses to recognize you, Mrs. Weatherby. It is simply that he *cannot*. That is the essence of all forms of aphasia. We must be patient. Time alone may heal the injury to his brain, or some untoward excitement, a blow on the head, may snap him back to his former self. We must wait—and hope."

Mere words, he commented bitterly to himself. The medical profession had made very little progress in the study of these strange cases; knew nothing of the inducing mechanism. His own surmises were too radical even for himself to think out properly. As for revealing them to his fellow physicians—

JOHN WEATHERBY was swinging happily along the great science web of Minipar. He had just fashioned from his inwards a space mesh, and he was inordinately proud of it. He dreamed of excursions through the galaxy of which Minipar was a member, such as others of the Miniparians took at regular intervals. He stared at its shining exterior as a newly made father stares fatuously at his hairless, shapeless offspring.

There was a rustling beneath him, a slight swaying of the strands which his keen tactile senses at once detected and ascribed to the approach of Korm. He swung around on all eight legs, grasping the web firmly as if to the manner born.

His voice whispered dryly. "Look, Korm, what I have made. A space mesh! Think of it, I'll be able to join you the next time you——"

Korm was not listening, did not even trouble to look at the rather crude inclosure. His faceted eyes were preoccupied.

"I have news for you, John Weatherby," he announced, "which doubtless you will be glad to hear."

"Eh, what's that?" Weatherby was rather startled.

"We've completed our researches into your limited intelligence," Korm pursued, "though the results, I must confess, have been rather disappointing. The council has therefore decided not to leave Heurilu in his odious exile any longer, but to return him forthwith to Minipar and his own proper body.

"That requires, of course, that you be transferred as well to that planet Earth from which you came, and to the society of those finite beings from which you were wrested rather unwillingly. They include, I believe, a certain creature whom you called Clara, and spoke of rather amusingly as your wife."

The spider form of John Weatherby sagged on all eight legs. In the rush of events he had completely forgotten that he inhabited the body of an alien, a Miniparian whom he had never seen. He had forgotten even that he was once an Earthman. And now the blow had fallen with crushing force.

"But I don't want to go back to that petty planet," he cried feebly. "I want to stay here always, with you, with Minipar. This is my home, my being." He actually retched at the thought of the ugly body that had once housed John Weatherby.

"There is no alternative," Korm pointed out kindly but firmly. "Heurilu is in exile, awaiting impatiently the resurgence of the thought web. The council's decision has been made. You must come with me."

The universe crashed and roared around Weatherby. He did not want to go back! He wouldn't! With a quick backward thrust he sprang into the space mesh, touched certain strands desperately with his antennæ. There was a swift upward surge, and he was far above the pinnacles of Minipar, heading outward into the vast unknown of the galaxy. Behind him, faintly heard, was the shrill warning piping of Korm.

He did not care. He was free, free to do as he pleased. The universe spread before him invitingly. He would cruise from sun to sun, from planet to planet, until—

Something whined alongside of him, drew parallel with tremendous acceleration. Long strands, thin as silk, stronger than the strongest steel, drew his space mesh inexorably tight to the pursuing fabric of Korm.

A great despair overwhelmed him. Now he must go back to Earth, to all the finite ugliness that it connoted, to a body that was weak flesh, supported feebly on two bare legs. He offered no resistance. Back to Minipar they sped, back to the science web, back to the thought-transference machine.

JOHN WEATHERBY opened his eyes, looked around him blankly. Strange faces, ugly, distorted, peered anxiously down at him. Then there was a cry—a human cry—and a bulky body hurtled toward him, wet his uplifted face with spatters of fluid. "John! John! Are you hurt?"

"Hello, Clara," he said weakly, and struggled to a sitting position.

"He recognizes me," she shrieked to the bending doctors. "He's cured!"

The brash assistant said confidentially, "He fell out of the window. No one saw him fall. It's just as Dr. Gruening said. A sudden blow, a concussion, would jar his memory back to the normal synapses. It worked just now."

Weatherby looked again at his wife, at the doctors, at the petty crudeness of the hospital, with an inward shudder of disgust. How ugly, how primitive, compared to the beautiful symmetry and

mighty science of Minipar! He opened his mouth to express his revulsion, thought better of it. He was back on Earth irrevocably; Heurilu, whose form he had inhabited, was once more back in that infinitely remote galaxy.

If he said anything, if he even hinted of his marvelous transference through the void, these dolts, with their limited minds, would consider him crazy, would lock him up in a madhouse. He must be careful!

They kept him in the hospital for a month, so as to permit his broken arm to mend, and his wits to grow strong. They charitably laid to his recent amnesia the weird remarks that occasionally escaped his unwary lips. Then they discharged him as cured, and sent him back to the bosom of his family.

In fact, by that time, he *was* cured. That is, the memory of his tremendous experiences on Minipar slowly faded, like the surface texture of a dream. Slowly he slipped back into the accustomed groove of normal Earth existence. Once more he became an inconspicuous, routine bookkeeper, leaving his desk promptly at five, entering the subway, journeying to his home, eating corned beef and cabbage on Sunday and hash on Monday. The glamour faded, until it was a dream, a hallucination of his sickness, something that had never happened. Still, it mustn't do to talk about it to any one, for fear of the asylum.

Thus it was that all of Dr. Gruening's efforts to draw him out met with a stubborn wall of silence. The psychiatrist retired, more baffled than ever, in the reluctant belief that his own wild surmises were just that. So he, too, said nothing.

Next month:

The Fourth Dynasty

by R. R. WINTERBOTHAM

Science Discussions

We're going to take another step after long and careful consideration, and it will tend to move *Astounding Stories* up one more notch as a worthwhile medium.

You who have been steady supporters of science-fiction have noted the tendency of letters in Brass Tacks to become monotonously alike. I have tried to encourage Science Discussions in the letters and there has been some response. But for the most part they still repeat a formula which serves as an excellent guide for me—but which does not create a sparkling department. I have come to recognize certain stock phrases, written dramatically to be sure—but not always original. "This story was passable, but how did that one escape your wastebasket?" That is one expression which is used to emphasize individual likes and dislikes.

Now I know that I buy good stories. *Astounding* has bought the best science-fiction available for three years. And these stories have brought, on the whole, very fine reactions from our readers. The percentage of approval has overwhelmed the disapproval, except in a very few instances.

I keep, and shall continue to keep, a tabulation of these letters showing reader-reaction. But, strange as it seems, there are less than fifteen hundred names on the list of contributors to Brass Tacks in the last year. We receive hundreds of letters each month—but they represent less than two per cent of the reading audience. Why? To me, after careful thought, the answer seems obvious: Only a very small group is interested in Brass Tacks as it now stands.

And that being the case we're going to do something about it. We want reader contributions—and we want those contributions to be of interest to the entire reading audience. Some readers have suggested a short-short story department. They are groping after the same thought. But that is not the solution.

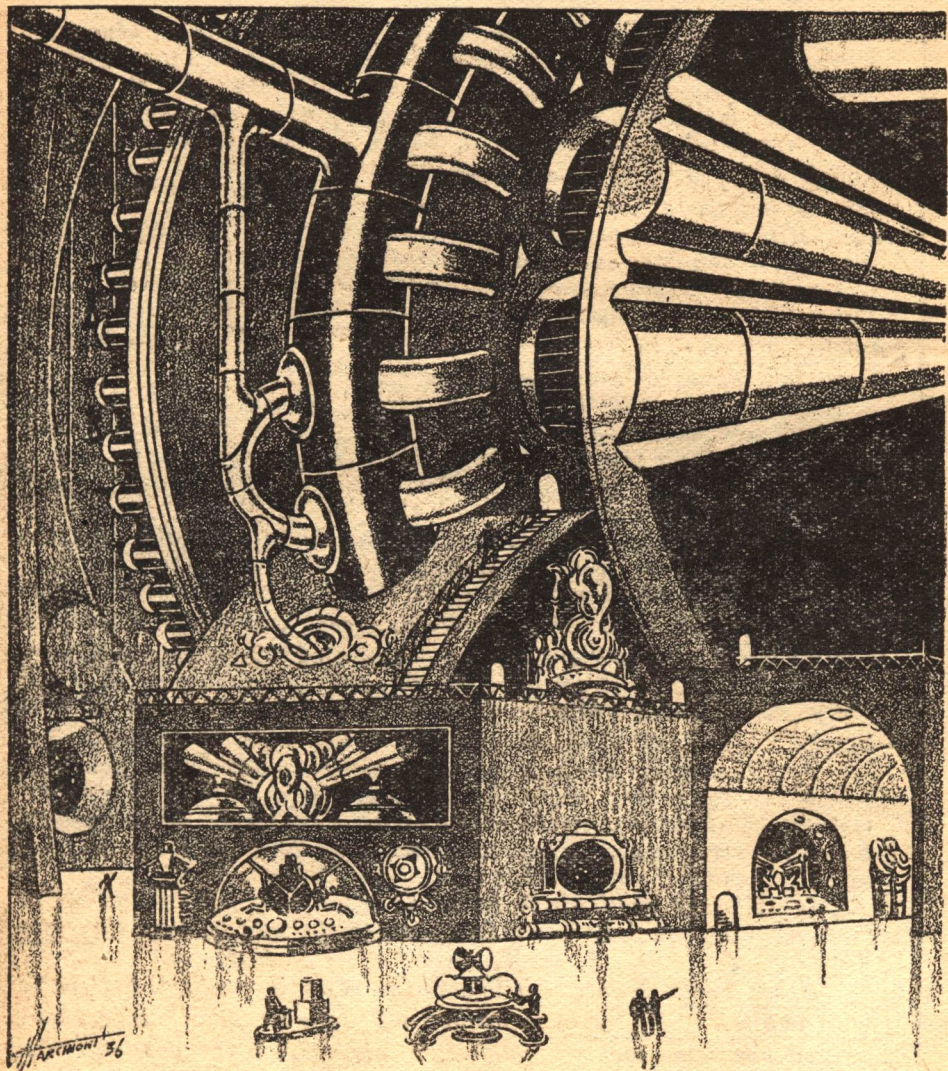
It will take about three issues to make the change—but we're starting with a nucleus which has become the best feature of Brass Tacks.

Brass Tacks department is about to grow into something really worthwhile. "Science Discussions" will take its place. Every one of you has some idea which veers slightly from the conventional. That is why the world progresses scientifically. We are going to give you an open forum in which to present these thoughts and defend them. *Astounding Stories* is again going to pioneer in a new field.

Next month I will continue this preliminary discussion. The change is coming. I expect next month's letters will discuss it. And I really hope to hear from the vast circle which has, up to now, taken a little interest in Brass Tacks. Think it over, will you?

The Editor.

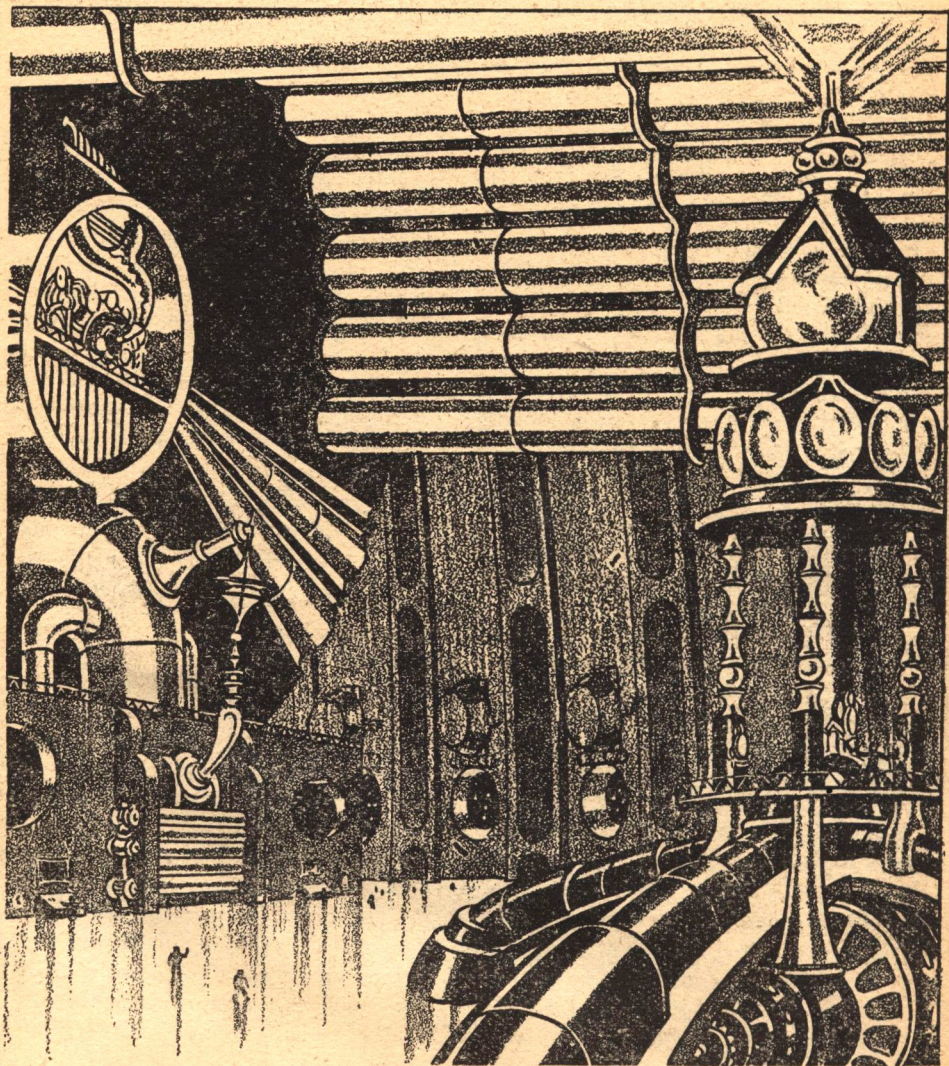
ANTON MOVES



*The cold black of interstellar space—
the misty curtain of stars and nebulae
—distances that seemed incredible—*

A great science novel by Ross Rocklyne

THE EARTH



ON MAY 17, 2676, Anton Larval, pirate extraordinary, was captured. It had been no fault of his own, for his ship was undefeatable. The carelessness of a pilot had foundered it on the barren crags of a planetoid and there, with his force fields down, and his attention rooted to things which drove out caution, the black crui-

Within the White Dwarf's gigantic form reposed titanic forces.

sers of the Interplanetary Police Force swooped down upon him.

At a later date he stood on a platform ringed round with televisors. Every eye in the world was on him. He stood six

feet two, straight as a column of smoke in still air. His green-trousered legs were braced apart; his arms hung easily at his sides; his great shoulders were thrown back. He had a huge chest, well fitted to any demands an alien atmosphere might make upon it, and it was thrown out for all the world to see.

He was handsome, was Anton Larval, and his laughing blue eyes gave electric force to his whole finely molded face. His hair was a mass of yellow gold, and it fell down to his shoulders, caressing the green of his jacket.

Also limned in the glare of the televisors was the president of the World Union, an old man, flowing of beard, kindly yet stern of eye. He was looking across at Anton with a singularly detached gaze. In fact, he hardly seemed to be looking at Anton at all, but at a point in the air halfway between—which to Anton made him look a little cross-eyed.

The world was listening. Preliminaries had been gone through with.

The president said evenly: "Anton Larval, for your piratical activities you have been sentenced to death. This is a penalty not often administered in our present world, since crime has been erased by psycho-analogical methods. But your case cannot be treated as such, for you are that rare type which works outside the law, not because of a mental disorder, but for the plain love of excitement and adventure."

His face became grave and accusing, as he shifted a little in his stance.

"You have had the callousness to play around in space, looting defenseless merchant ships, holding passengers for ransom, and in other ways making yourself a pest to a world which will be buried in fire before the year is done. It was within your power to assist the world against the strange doom that overhangs it. But you chose, rather, to satisfy your own petty desires!"

Anton's eyes flashed defiantly. "I

didn't," he said coldly, "know a thing about it."

"You've said that already," the president said quietly. "Perhaps we should believe you. We *will* believe you!" he added with vehemence.

"Anton," his voice seemed to fade away into a weary whisper, "the world gives you freedom, freedom such as no man has ever known, on the one condition that you devote yourself to its salvation. You built a ship. She was invincible. She was a creature of your own intellect. Now the world asks you to devote that vast intellect to something which should certainly seem worthwhile, even to such a rebellious mind as yours."

Anton's yellow brows lowered, and his thin lips curled up in a snarl. He turned a slow circle, glaring into each televisor. Well enough the president saw the strategy of forcing an answer from him with the eyes of the world on him—to shame him into consent!

SUDDENLY Anton raised an arm in a disgusted, threatening gesture. "Ah-h!" he growled at the billions of Earth's inhabitants. "I'll save your old world! I'll save her if it takes every waking moment of the next year! That's what I'll do!

"But there's to be freedom at the end of it!"

"There will be freedom, Anton, freedom at the beginning of it, freedom to pursue any course you may wish, freedom such as no man has dreamed of!" The president revealed his strong old teeth and laughed. His kindly eyes twinkled. He nodded once at the televisors, and raised an arm. The televisors went blank. The broadcast was off.

Anton was a free man at that moment, for the president waved his hand at two armed guards standing in corners of the room. They sheathed their projectors and walked away.

Anton couldn't believe it for a mo-

ment. "Free?" he exclaimed suspiciously.

"From now on, Anton. Perhaps I should impress on you that you are our last hope, for other scientists are at a loss."

Anton looked around the empty room, then back at the other man, a certain implication in his blue eyes.

"You could murder me now," the old man shrugged in agreement. "But remember to save the world afterward."

"Eh?" Anton blinked, regarded the bearded man strangely. "Well, somehow I never feel like that." He started walking rapidly up and down the room, his head tossing, his yellow locks slapping against his shoulders.

"Freedom such as no man ever had!" he growled. "Well, you captured a round dozen of my men—set them free! But bring me Riss Taylor!"

"Riss Taylor?"

"My senior pilot. We'll save your old world!"

"Not the one that——"

"My pilot, you mean? No, he's dead, thank Heaven! So bring me Riss! And," he snapped, "send me somebody who knows what's menacing this Earth of yours. I have to know what I'm fighting."

"All shall be done," murmured the world president.

"And you might reconstruct my ship the way she was before disaster came! That'll be all for the time being!"

This happened in the New York of 2676.

II.

ANTON stared into the four-vision plates above the instrument board of his reconstructed pirate ship. That ship was at present stationary between Mars' orbit and the asteroidal belt.

Out there, against the ebon backdrop of remote space, burned a fire, a varicolored phenomenon composed of leaping tongues of flames and sparks—

sparks which leaped, died, and leaped again, a little like sparks from an anvil! But it was pure heat which radiated from them, almost sunheat; indeed, it looked as if some celestial giant had scooped up some sun stuff in the palm of his hand and flung it out into space. The whole conflagration raged over not more than ten square miles, but a sensation of implacable ruthlessness leaped from the furious area along with its blinding light.

"Anvil sparks!" Anton rumbled in contempt.

He swung around in a jointed chair, and stared at the mannishly clad girl who stood by his shoulder. Zala! Even yet he hadn't got over the shock the president had imparted by sending a mere girl to detail the nature of the danger that threatened Earth. But the slim-shouldered girl had calmly told him that she knew as much, if not more, than any one else.

"I've spent a long time getting science degrees," she had told him, "and I've gone to universities on Mars and Ganymede as well as some on Earth."

Now she seemed unperturbed by his scowl.

"Well," she returned evenly, "the first news commentator to broadcast some of the facts about them compared them rather poorly to the sparks that leap up from an anvil. An easy phrase like that is infinitely preferable to some fool term the scientists might think up."

"That fellow must have been reading a historical romance," growled Anton. "There aren't any more horses. What do you call them?"

"What everybody else does, Anton."

Anton looked disgusted. "And you pretend to understand them! What do you think of that, Riss?"

Riss, a tall, angular fellow with a red face, and shoots of red hair sprouting from various widely separated portions of his almost bald head, was staring

nervously at the anvil sparks. He jerked abruptly when Anton spoke.

"Why, I think that's the craziest thing I ever heard of!" he said, looking uncertainly at Zala and then back at Anton.

"Certain it's crazy," replied Anton, keeping the corners of his mouth straight.

Zala looked from one to the other and smiled. "All right, Anton, you win. But I want to tell you about the anvil sparks.

"They compose a hyperspatial sun."

"They?"

"Oh, yes; they're connected, all right. Now I want you to take up a position below this one—on the other side of the flames, that is. I want you to take a photograph of it, and then we'll skip across to point 790 in the Mars orbit, and take that one, too."

She met his stare calmly. He said nothing and finally complied. He shot the ship below the infected area, and turned her nose up. A sheet of opalescent light ten miles square, and gently wavy at the edges, stared down at them from the sea of faint starlight that surrounded it. Of leaping flames and sparks there were no signs. "Just a smooth plane of light, jumping out of nothing. Now take an exposure."

Anton did so, and then turned the ship in the direction of the adjacent anvil spark, some million miles from a point in Mars' orbit. Arrived there after some hours, he subsequently took an exposure of a slightly smaller section of the strange phenomenon. Over a period of days to follow, then, a dozen prints were taken, all at right angles to the smooth areas of apparently sourceless light. Riss took the negatives to the print room on C Deck and washed them, brought them up. At Zala's request he laid them out on the chart table in the order of their taking, which had also been in the order of their positions in space.

Pointing out two adjacent ones, the

tall girl asked, "See any similarity in outline?"

"Not a bit!"

"Watch."

SHE took the two films, one in each hand, and arranged her fingers in such a manner that each negative was curved several times down its length. Then, closely regarding them, she distorted them until they apparently met her satisfaction. She spoke to Anton, who arose with a look of scorn, and turned the printed side of a solar chart to the wall, leaving a blank, white surface facing them.

Zala held the distorted negatives not far from this surface, and Anton flashed a bright beam of white light through them, projecting them apparently uncurved onto the white surface.

"You see, now?" asked Zala.

Anton *did* see. "May heavens fall and stars crash!" he muttered. "Zala—you've got something."

She moved the projections closer, so that their adjacent edges touched, fitted snugly into each other, like the ragged edges of a sheet of paper torn in two. She carelessly threw the negatives on to the table, put her fingers in small pockets on the front of her many-colored coat, and sauntered across the control room, to look out again at the strange raging phenomenon.

"That's a point I discovered myself, Anton, and the others are all the same. Those patches of flame are distorted in the first place—like your shadow, maybe.

"But they really are projections," she went on. "They came from hyperspace, you understand, a universe co-existent with ours but removed from it by one extra dimension. Well, one dimension twists things up considerably, and I don't think that what we'd call a circle here would be a circle over there at all. It's no wonder that when this sun—just a small one—ripped through the barrier consequent upon some space

strain, that it found itself unable to exist in a single place in this universe. And the pieces came through as projections from that twisted universe to this one. Result: the widely scattered anvil sparks, so-called.

"So they are connected, but on the other side. That's why they seem to leap from nothing."

Anton snorted. "Nth-power stuff," he said. "Zala, I'm not much on that sort of stuff. My meat is solid, understandable mechanics. You people who deal with infinity, hyperspace, and so on, think in circles, and you couldn't draw a straight line with an end to it to save your lives. Well, go on. Oh," he added slowly, "I'm beginning to see. Suppose there was a sort of adjustment going on, an adjustment to the geometry of this space. And suppose that Earth happened to be where the adjustment is finally complete! That's it—eh?"

Her eyes showed approval.

ANTON leaned back and laughed disgustedly. He finally let his eyes rest on Riss. Riss' red sprouts of hair were waving a little in the breeze from the ventilators. He waved his arms nervously.

"That's the craziest thing I ever heard of!" Riss complained.

"Just so!" Anton's eyes seemed resting on something not in sight. "I begin to see, again," he muttered softly. He said almost derisively, "You can't, of course, deflect it from its path or destroy any anvil spark?"

"Tried; can't!" She met his glance defiantly.

"You knew all along then what the Earth was asking of me." He smiled twistedly, in grim humor.

"Certainly I did. But nobody else knows how to go about it. That's why they asked you."

Anton looked at Riss.

"Riss," said Anton, "how would you go about moving the Earth?"

"Moving the Earth?" gasped Riss, his red moon of a face suddenly working. "Anton, that's crazy! You can't move the Earth!"

"Indeed!" remarked Anton politely. "Well, the fact is, I've got to move it. You know, I'm under a contract. Freedom if I save the Earth, and I have to move it to do that, you see."

"But you don't know what you're up against, Anton! Why"—Riss' hands groped expressively—"the Earth moves through space with terrific velocity! And it's heavy! You couldn't apply the power to give it a new orbit without breaking it up! You'd have to do it smoothly, handle it gently. It's crazy!"

Anton waved a scornful hand at him, turned around, and applied power to the rockets. The stars of space did a somersault.

"We'll return to Earth," he decided. "I've found out all I wanted to—mainly, that I've taken a big bite and don't see yet how I'll swallow it." He grinned at Zala.

"But you *will* move it?" she asked, suddenly seating herself beside him, and studying his hard profile with an unconscious wistfulness.

"Certainly I'll move it," declared the outlaw, suddenly swerving the ship. A dully shining body swung past in the port plate.

"But how?"

"Haven't the least idea—none at all."

She was laughing. "But you'll have to give it a new orbit."

"Well, that seems natural. Don't worry about it, Zala."

She arose and walked the room, absently fingering the shiny surface of instruments. She stopped and sighed. "I agree with Riss, all right. It's simply crazy! But you'll be a hero."

"I don't demand hero worship," Anton said, turning his head. "They promised me freedom, and that's all I'm look-

ing for! I'm not a native son of Earth, so you can't expect more of me."

"You know," she murmured dreamily. "I can tell you what will happen. You'll save the Earth, and you'll go back to your piracy. But you'll come back to Earth again, and stay as one of her leading men of science."

Anton adequately showed that he disbelieved her utterly.

"Because," she went on, "nobody, especially you, gets any fun out of fighting empty air!"

She flung him a dazzling smile from lips that were naturally red, and left the control cabin for her own quarters.

The ship flung itself through space, toward Earth, for some few days. The planet grew into a fascinating green disk. Finally the first trace of atmosphere enveloped the ship. Anton's senior pilot, Riss, landed it softly in the court adjacent to the building housing the outlaw's large, private experimental laboratory.

III.

ZALA entered this laboratory one day, directly from an elevator, walked through a hall and into a plainly furnished room. Through an open door she caught the whine of a dynamo, felt the twang of ozone in her nostrils; Riss was in there, an anomalous-looking contrivance rigged up to a power source.

Several times he made adjustments in the positions of anode, cathode and anticathode. A hazy aura would surround the machine, shift back to invisibility.

Riss would carefully train a projecting arm of the apparatus at an object sitting on a pedestal, switch in the power, then quickly cut it off. Too late this time, for an iron sphere came sailing across the room, with a crash capsizeed the machine, breaking its fragile glass parts with a raucous tinkle.

Riss cursed desperately, ran his hand

distractedly across his bald head. With a sigh, he uprighted the remains of the contrivance, wheeled it across the room.

Zala turned to Anton, who sat stooped over a table littered with sheets of paper scribbled on profusely.

"A whole month has passed," said the girl, having a hard time keeping the note of hopelessness out of her voice. She undid the catch that held her short, brightly checked cape to her shoulders. "Can you see a solution yet?"

"Well, of course I can't," the outlaw replied irritably. "Don't feel the bite of a single idea. But I've figured how it can't be done.

"You couldn't do it by causing an unbalanced condition on Earth—make her top-heavy by draining the Arctic, for instance—as that would just change the inclination of the axis. And huge rockets are out, too. The Earth revolves, and it'd be silliness itself to attempt the construction of relatively motionless rockets. We haven't got enough time for something like that, either.

"Again, the use of such rockets would cause more damage than we'd ever be able to extricate ourselves from. Jerky motion would bring the buildings of all cities tumbling down. That would eradicate the human race just as surely as the anvil sparks. When I move the Earth it's going to be done so smoothly nobody'll know it."

"When you move the Earth," she repeated, as if the words were magic. Then suddenly, worriedly, "Anton, are you being too confident? You know, you simply can't fail."

"Correct! I *can't* fail, because I've learned that the only limit of possibility is that of a man's imagination. I'll find a way."

Silence fell. Anton's brows drew down in a frown. How to move the Earth? Suddenly he looked up, and found Zala's eyes on him. They were a woman's eyes. Anton's own eyes

could not draw away. Something unknown coursed through him. Then he shifted his gaze, his face holding a disturbed expression. Finally he arose, crossed to her and laid his hands on her shoulders. She sighed a little.

"Zala——" Anton started, then stopped. For a while he didn't see Zala. He saw space, and stars swinging in terrific circles as his pirate ship scraped the belly of some huge transport. He saw the stab of force beams, the flash of heat rays, felt a body hurled against him, felt it rise up and grapple with him. Forcefully, his former care-free life, standing up suddenly in his mind, beckoned to him. He turned away from Zala, and started to pace up and down the room.

"Riss insists it can't be done," he said at last, when some of the tension had worn off. "But I'm wondering about the use of the magnetic beam—projected from a ship——"

"Won't work," cut in Zala. "You can't move the Earth that way; you'd just move the ship."

"Oh, certain. But you could use thousands of ships, but even then—— The thing is, we've got plenty of power, all we need—the atom, you know. But you can't use it fast enough to do the job.

"And I couldn't project such a beam from another planet, either—too much crazy motion to contend with."

He walked across to the window, displaying a supple, animal grace. The Moon rode low; it was night. His lips absently formed the names of some of those dark areas on the Moon's surface.

"Tycho, Sea of Serenity, Archimedes and——"

He turned back from the window, paused in midstride. His blue eyes snapped; an expression of revelation crossed his hardened features. Zala sensed triumph in his eyes.

"It could be done," he muttered.

"What is it?" Zala breathed.

"Quiet," Anton said, his face intensely speculative. "I'm straddling an idea," he murmured, then softly, "and I've got its shoulders to the ground!"

At this time, Anton had eleven months in which to give the Earth its new orbit.

THE WORLD of 2676 boasted a well-groomed race of people; thus, the mutterings of what seemed certain doom sounded in calm ears. That the dreaded anvil sparks, apparently sourceless areas of space infection, were to sweep down out of the void and bury the Earth in a holocaust of fire, was common knowledge. Ever since they had appeared at fifty varied points between the orbits of Mars and the asteroidal belt, men of science had not taken pains to misinform the world concerning the fact of their steady convergence on Earth; indeed, they had frankly stated that they knew of no means by which they might combat the menace.

From the mysterious depths of space had come tales of a yellow-haired pirate with a wealth of scientific genius. The powers of the whole Interplanetary Police Force had been centered on the one object of dragging in Anton Larval.

Anton had been captured. His strange contract with humanity put new energy into its hopes of survival. A month had passed. No word had come from Anton. And then once more Anton stood before the televisions, the yellow-haired, handsome giant whose principles the world abhorred, but whose electric personality was wired up with every human heart.

Anton's brows were down. In the rôle of hero he felt ill at ease. But here he was, and he had to say something.

"I'll save your old world," he roared into the televisions, tossing his head. "I've found a way! I've found a way to rip this old Earth of yours from her orbit and give her an entirely new one. I haven't got anything else to say at

present, except that I'll do it so smoothly you won't have to endure anything more than a loss of comfort due to the failure of all electrical devices for as long as I take to flip the Earth's orbit. But when the anvil sparks meet, the Earth won't be there!"

He stepped from the glaring lights of the televisors, and Zala came toward him, smiling radiantly.

"But you wouldn't tell them how you were going to do it, Anton. Won't you even tell me?"

"Rather keep it to myself for a while, Zala. Too many cooks and so forth. But I want you to work with me, all the way through—and you can have the credit if you want it."

She stared at him, and then blinked rapidly. "No, of course not."

"Well, I've got a task. Riss and I are going to have to invent the incredible beam! It'll have to be so tight that it won't leak even over billions of miles!"

She started to shake her head doubtfully.

"You think it's impossible, do you? Remember what I said—man is capable of anything he can imagine. Riss and I'll get that beam, and we'll make it sit up and do tricks. When we get through with it, we'll not only have a tight beam, but we'll be able to control its length. And anything it touches will be held in a grip that can't be broken. That's what I had Riss working on the other day, trying to take the attractive force of my magnetic beam, but leave it with a grip.

"Anyway, I *have* to have that beam! Necessity, as the old saying goes, gives birth to invention.

"Well, let's go back to the laboratory."

BACK in the laboratory, Anton called Riss. Riss came into the room.

"I listened to your broadcast," he said, his hands nervously washing over each other. "Have you still got that

crazy idea, Anton? You can't move the Earth!"

"Quiet!" Anton admonished. "Now, have you washed the magnetism out of that beam?"

"Certainly I have, but you can't project it from a plan——"

"I'm not going to, Riss. I want you to get started at something else in that line. Over what distance can you keep leakage in a beam down almost to zero?"

"Well, theoretically, any distance, if you could keep it from diverging. Maybe put a thin tubing of high-frequency radio waves——"

"Certainly, that's it! You have to control its length, but that'll be a simple matter of perfect interference, won't it? You can do that, can't you? I'll help you on the hard points."

Riss said, "Certainly I can do it! But what's the use, Anton! You can't move the Earth!"

"Well, I will, and it may interest you to know I got my idea from an old Greek philosopher named Archimedes. Go on, what are you standing there for?"

"It's those damned atomic motors we have to use—95 per cent inefficient!"

"Yes, I know," replied Anton contemptuously. "Zala, haven't you scientists on Earth figured that instead of using the 5 per-cent energy they can get from the atom, and letting the other 95 per cent escape, that they should concentrate on capturing the escaping 95 per cent and letting the other 5 per cent go?"

"We can't figure out things that complex," she answered patronizingly.

"Well, I'll have some plans drawn up, and we'll have to have some of those motors installed. Another secret gone. So many inquisitive scientists were poking their noses in places around my ship that I've hardly any secrets to myself—the Interplanetary Police Force will nab me first thing."

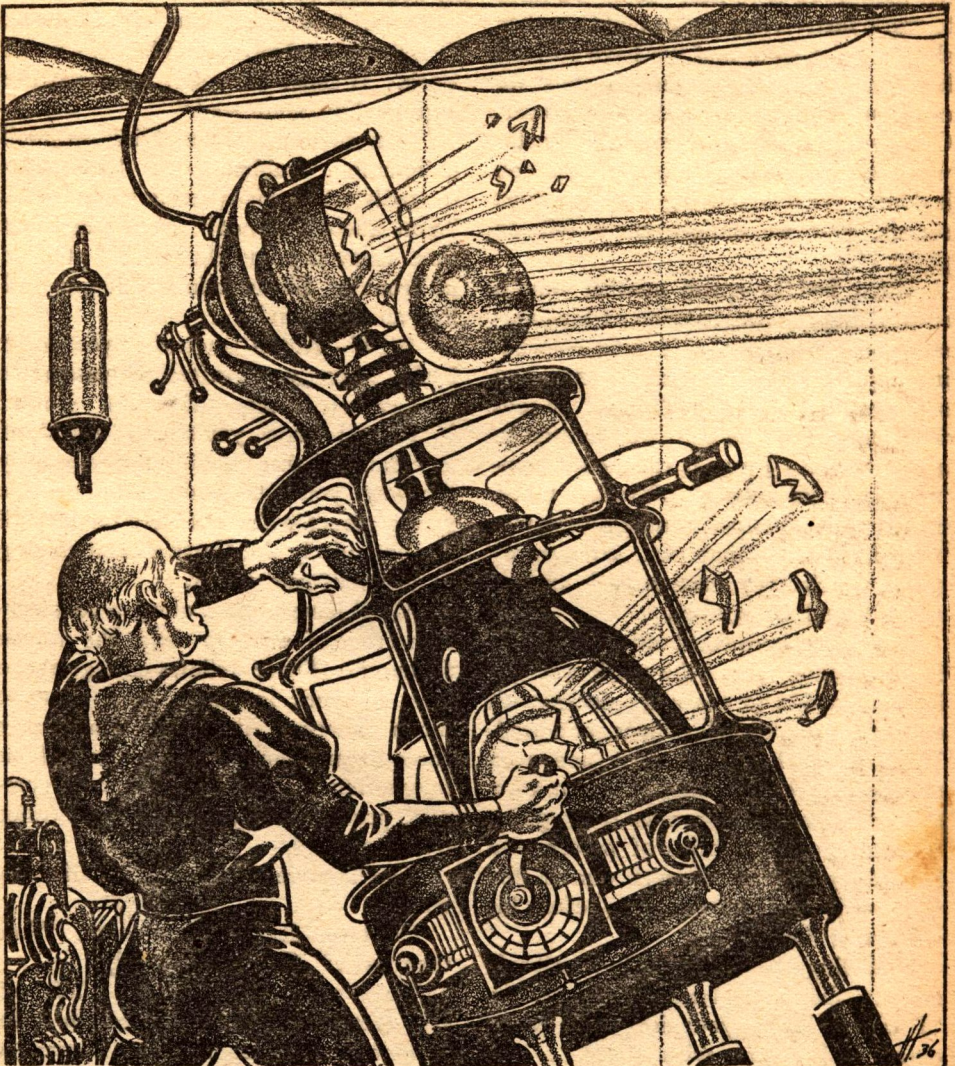
"Oh, they won't be able to."

Anton looked at her curiously. This was another of her veiled allusions, but he could think of absolutely nothing that might give her grounds for her statement.

IV.

"CAN'T," said Anton, "is the worst word ever spoken. It's done more harm than slander and lies. Riss says I can't

move the Earth. You say no beam can be tight over a distance of billions of miles. Well, I've got a small model of the latter, and I'll do that former soon. I've got that beam within half a mile of that asteroid out there. I can control its length; and it's not action at a distance, either, as the ancient scientists said of gravitation. I'm going to send it that extra half mile, so grab your own personal momentum and sit tight."



Riss would carefully train a projecting arm of the apparatus at an object sitting on a pedestal, switch in the power, cut it off. But too late—

Immediately the ship jerked, took on additional speed and a new direction.

"The beam grabbed the asteroid, but the asteroid simply dragged us along with it. Now, with a solid foundation to hold it down, this beam could jerk a close comet out of the sky.

"Well, that's that," he said in deep satisfaction. "Riss, we did a good job. By Heaven, the Earth is as good as saved, but it'll take the whole remaining ten months to save her. Now we have to work fast. We have to build another ship, a huge ship, and we have to load her down with the densest metals we can find, to give us unlimited power. Once we get started saving the Earth, we won't be able to stop until the job is done. We'll be moving at tremendous speeds, and we simply can't fail on power!"

Anton had to spend another month supervising the construction of his monster ship. And it was a monster—being a quarter of a mile in diameter, and spherical in shape. The "brain," or control portion, of the ship was located in a tiny sector. From it radiated a complex, intricate network of rocket tubes, coated with asbestos. And asbestos was needed, for into that vast, now empty space which they crisscrossed, molten metal would be poured.

Freighters were constantly landing on the compound where the work was going on, loaded to the after decks with meteoric iron, nickel, copper, and lead. There was a huge pile of it, and even now kilns were melting it down to a molten state. Anton was truly going to need great quantities of power, and he was going to convert almost the whole ship itself into energy, before his work was done.

Watching the scene of indescribable activity, Zala looked searchingly at him. "I wish I knew your idea, but whatever it is, I'm going with you."

"Yes, of course." He took a step toward her, his eyes suddenly losing their

habitually fierce expression. He hesitated, shook his head, took a deep breath. "Yes, I'm taking you, and I'm taking Riss."

Riss was nervously rubbing his hands over each other. "Anton," he said desperately, "you must be crazy! You don't understand the terrible kinetic energy the Earth possesses. You don't understand how heavy it is, and how fast it goes! And you're going to move it, with this tiny ship!"

Anton looked at him speculatively. "Riss, you're always afraid things won't work. It must be a sort of cowardice ingrained in your soul."

"I, a coward!" cried Riss, in high indignation, rubbing his hand distractedly across his sparsely haired head. "You know I'm not! Remember that time I saved your life when I stepped in front of Silvastrado's heat gun? I lost an ear then."

"Well"—Anton laughed—"you got it back, when we grafted Silvastrado's own ear on in place of yours. Forget it, Riss, I know you're not afraid of any damned thing under the sun. By the way, you'll be senior pilot on this young planet we've got here, and you'll see how nicely the Earth's orbit's going to do a half somersault.

"We'll have to take along a considerable crew of men, to stoke the atomic furnaces. Those fellows are going to have to work in shifts, we'll need so much power. And we'll grab up a force of mathematicians, too, to aid the integrating machines in the most complex problems they've ever been called upon to solve.

"We'll move the Earth, old lieutenant."

He stared dreamily into space. "And then what?" Zala asked softly.

"Back again, right where I left off. By Heaven!" he exclaimed in awe. "There's no other life for a man—a hand-to-hand fight in the companion-way of some merchanter, with gems

stacked in her holds like fish in the bottom of a dory! Zala, you must understand that this business of moving the Earth is just an interlude. I mean, it's a contract I've got to fill. And then——" He turned suddenly and met her eyes. "I'm kind of sorry I like that life so well."

Strangely, her eyes misted. "I am, too. I'm afraid the president is really playing a mean——"

"What?"

"Oh, never mind. Look, Anton! They've begun to pour. It'll take them a week to fill that space with molten ore, and another week to cool, and then we'll be off!"

ON ITS METAL CRADLE, the great spherical vessel, already christened the *White Dwarf*, looked imposing and magnificent: it blazed with the splendor of a star. Within reposed titanic forces which could shoot sheets of repelling flame from any one, or all, of the thousand rocket jets dotting the exterior of the ship; but the main purpose of that energy, created from the dissolution of dense metals into the original building stuff of the universe, was to feed a beam that could flash out from the ship to any controlled length within billions of miles, leakage being so small that it would prove no difficulty at all. That beam, once it stabbed through a planet or any other celestial matter, would never let go until it was cut off at the source.

It was this colossal beam—flashing from the great shining "eye" of the ship—that was to move the Earth. Externally it was evidenced by a large circular area lying in a plane perpendicular to that in which the controlling mechanisms lay, and it was composed of thousands of tiny orifices, each shooting forth high-frequency rays of Anton's devising.

The *White Dwarf* was the strangest sky ship ever built, for only a fraction

of her bulk would remain after Anton's "contract" was filled. When that ship returned to Earth it would be an empty shell, with a tiny space on its perimeter used for steering gear, generative devices and human occupancy.

Anton sat in a tiny room in that space, his yellow brows frowning as to his ears came the muted roar of thousands of people down below in the compound, waiting for the *White Dwarf* to take off.

Sitting in that same room, tensed with the excitement of departure, was Zala, clad in the clashing colors of that day. Anton was dressed as he always dressed—green and nothing but green, for that was the traditional color of his kind.

There were a dozen vision plates arranged circularly before him. Six were calculated to give him a complete view of the whole celestial sphere. The rest presented the ship's interior in every detail: the engine room, where even now the atomic furnaces, stoked to the brim by men who used hot pencil beams to cut away great cubes of metal, activated generators which in turn fed immense accumulator coils; there was the pilot room, with Riss sitting before the control panel, nervously inspecting every switch and meter and reaction control button; there was a special room where four mathematical experts fed problems it would have taken them years to solve into the mouths of integrating machines so complex they almost thought for themselves.

Elsewhere and everywhere was bustling activity, but, principally, there was a corps of beam experts—they were called luminologists—who gingerly inspected every wire, reflector, and connection of that immense device which was to send the beam tearing through a space inconceivable to the human brain.

Anton watched all this with some satisfaction. He felt a throbbing of emotions he could not define, but it was the

sensation of the unimaginable power he controlled. It seemed glorious, suddenly, and not so trivial now, that he had been selected to perform this incredible task.

He held a stop watch in one hand. He had everything planned out in the nicest detail—a certain time for this—down to the second—and a certain time for that.

THE SECOND STRUCK. A gong rang through the ship, and Anton murmured in the pilot-room phone, "Hit heaven, Riss, and you know your objective—a point in space on the other side of the Sun and a million miles from it, in the ecliptic plane."

Riss pushed in a plunger. A shuddering ran through the craft, as furious streams of flames strove to lift her from the confining bonds of gravitation. There was a sense of swift motion. In one of the vision plates the Earth rushed away, faster, faster, faster. Her landscape telescoped. Minutes passed. She became a flat disk, finally a globe. The Moon rushed up to join her. They receded.

Hours passed. The Sun swung slowly from the fore starboard vision plate, edged over into the fore plate. It rushed up, growing bigger, bigger. They had been "in heaven" for some seven hours, and at terrific speed had flashed across some 100,000,000 miles of space.

The Sun was a vicious mass of flame, little whirlpools swirling on her surface. There were vortexes of fire which clashed together, spouted up like locomotives meeting head-on. Little tongues of pure heat leaped and danced on its surface, and made its perimeter ragged. Titanic seas of violet gases gyrated dizzily, and executed Terpsichorean transitions, like sentient beings. Sun spots—huge, shadowy cavities—were numerous over the whole face of the disk.

Zala stared in fascination at the wildly erupting star. She had never been this near the Sun before. She asked, "Won't the heat leak through?"

"Not at all. I've got the same screens out that made the force beams of the Interplanetary Police Force useless." He laughed whimsically, in reminiscence. "Those screens were useful! I used to drive near the Sun a good deal. The Interplanetary Police Force couldn't hurt me any, but they could be damned annoying. They can't get near the Sun, and that gave me a short cut they could never take. It'll be useful again, unless they've stolen the idea from me."

"They haven't taken it," she assured him. She started to say something else, but only smiled.

Anton continued to snap orders into his phones, chiefly to his mathematicians. They would feed his problems to the integrating machines, relay them back. Anton would use them to instruct Riss in the position the ship was to take.

"We're motionless, now, in the plane of the ecliptic, and with Sun and Earth we make an angle of one second of arc less than 180° . In exactly sixty seconds, Zala, the beam will be snapped on, straight for the Sun.

"We're exactly motionless. You can check that by using the Sun spots as a reference. On the Sun's equator one makes a complete revolution at the end of twenty-eight days, and that's the Sun's speed of rotation. That's how they discovered it in the first place—Sun spots."

She sat silent in speculation. Her chin rested on the palm of her hand. Her gray eyes were intense with thought. Then she looked up.

"I see part of it, Anton. In other words, in some eight or nine minutes, allowing for light velocity, the beam will connect the masses of ship, Earth, and Sun. But how can it go through the Sun? Won't there be a terrific loss of energy?"

"Well, Zala, the Sun is only 1.4 times as dense as water, and my beam has a good deal of penetrative power behind it. The Sun won't bother it a whole lot—but, of course, that's going to cause more absorption of power than anything else. We can handle it, all right."

Her eyes widened, and, suddenly, she jumped to her feet. "If we're motionless, there's going to be a sudden acceleration when that beam grabs Earth! Why——" She sat down again. "No, there won't," she muttered.

"There won't," agreed Anton in amusement. "The Earth has a speed of about nineteen miles around the Sun, per second, but it's situated 93,000,000 miles from the Sun. Well, when the Earth moves into the tip of the beam, we *are* going to be jerked, but we're so close to the Sun we'll be able to stand it. While the Earth moves through a second of time, and nineteen miles, we'll be moving only a ninety-third of that distance. Just like a wheel."

He was watching her closely. "Figure it out, Zala. You've got the whole thing on the tip of your tongue. I didn't tell anybody about it at all, even you. I was afraid it would leak out, and that at the last minute some scientist with oversize apprehensions would have me certified insane."

She was searching his eyes as if she wished to go beyond and probe into his thoughts. Her eyes flashed suddenly.

"Archimedes!" she breathed. "Didn't he say that if he had a suitable fulcrum for a lever, he could move the world?"

"Certainly," said Anton easily. "He did! I'm applying that ancient principle, and the Sun was the best damned fulcrum for a first-class lever that I could think up!"

"But," Zala said uncertainly, "the rotation——"

"Won't be affected," Anton snapped. "We're moving mass, and our lever is based on energy, not rock."

V.

NINETY-FOUR MILLION miles away a celestial globe some 8,000 miles in diameter moved into the waiting tip of an invisible beam of pure force, that held her tight like a giant fist. Immediately, the Earth was assailed with a magnetic storm unparalleled in history. All electrical instruments ceased to function. Cities went dark. Candles, oil stoves, and steam engines took over the burden that electricity had formerly handled.

It was weeks, however, before things were in comparative order, even though the Earth had certainly not been unprepared for something in the nature of what had actually occurred.

But nine minutes after the beam grasped Earth, the impulse of her kinetic energy traveled back to Anton's ship. For a moment the *White Dwarf's* inertia held her motionless; then she rapidly built up to a velocity that culminated in approximately the speed of sound. All the occupants of that ship were at that time strapped in cushioned chairs placed in grooves a hundred feet in length, and in each groove was a tube of compressed air, which absorbed the greater part of the shock.

It was over in a second, as the *White Dwarf* had now attained constant speed. Anton's space-hardened frame withstood the shock, but Zala was lying limp, as was the coterie of four mathematicians. The corps of luminologists was in the same condition. In the engine room men were already rising groggily to their feet, and putting away the acceleration chairs in view of the strenuous work awaiting them.

Anton rose to his feet, got a container of water, and forced some between Zala's lips. She stirred, sat up, smiled brightly, jumped to her feet, unbuckling her cape, and shaking down her auburn hair. "I'm all right."

Riss moved after a while, and went

back to his instrument board. Anton went down into the plotting room and massaged the mathematicians into wakefulness, and then went into the luminologists' quarters. They were moving, pained expressions on their faces. Anton laughed, and went up to his work again.

In a few moments things were going correctly. Anton spent more moments giving instructions. An acceleration in the *White Dwarf's* speed became evident. The great, brilliant disk of the Sun began to shrink. Then Anton sat back and turned to the plainly curious, but unquestioning girl.

"From now on, everything should be easy," he remarked, and yielded to an old habit by pacing the length of the room. "But it's complex. The Sun's getting smaller. Well, at present we're a negative torque on the short arm of the lever, and the Earth's moving us, instead of us moving her. Not much strain on the Earth, since the vector we've got on her is practically zero. It takes less energy for her to move us now than if we were on Earth itself. You know, the law of moments—multiply the length of the long arm by the weight of Earth, and compare it to the product of the length of the short arm and the weight of this ship. No comparison, you see.

"BUT we have to get on the *long* arm of the lever. That means we have to go out and out and still out! We have to get a mechanical advantage. We could never apply enough force to move the Earth when we're only this far from the Sun. We've got plenty of power, but can't use it fast enough. We simply have to apply that same force by using it over a much greater distance than the Earth herself can move in the same length of time.

"That's the whole idea of the first-class lever, and almost every mechanical contrivance, for you can't make any

machine without using the principle of the lever. The human arm is a lever in itself—first, second and third class.

"For a while we can give the Earth the burden of moving us. We'll concentrate on getting beyond the orbits of the minor planets. After that we have to apply our own power to get a forward movement. The strain might tell on the Earth. Remember that our speed is going to be directly proportional to the length of the long arm, but our kinetic energy is going to increase as the square of our velocity."

Zala nodded in understanding and put in, "Kinetic energy of a body is equal to one half the product of the mass and the velocity squared."

"So," Anton continued, "we have to get one thousand astronomical units out, one thousand times the distance from Earth to Sun."

She started pacing up and down beside him, her head reaching just about to his green-clad shoulder. "But have you calculated everything? The planets, for instance. If the beam should hit them they'd apply a torque you never could compensate for."

"That's figured in," he declared. "At present all the minor planets are playing tag on the other side of the Sun, and none of them lie in the plane of the ecliptic anyway. The majors are so distant from each other that when the beam starts dipping down at our end and raising the Earth at the other, it won't possibly collide with them.

"There's a possibility I may hit a cross section of the asteroids, though. But they revolve around the Sun in the same direction we will. They'll apply positive torques and help us. Not to say we won't have to adjust the number of rocket tubes we keep going. At all costs our velocity must remain constant, or the Earth'll stagger.

"But if a comet hits the beam, negative, it will be a problem. But we could overcome that, too. Unless it hits the

beam near the ship," he added, "then it might be too bad."

"And you said you'd move Earth smoothly." She smiled.

"Well, I'd dislike very much losing your respect for my honesty, Zala." He grinned down at her. "I'll do it the way I said."

TWO WEEKS PASSED. The *White Dwarf* flashed at frightful speed through space in two directions approximately right angled to each other, which made her resultant path a long, even curve. Past the orbit of Mercury, trailing the beam, past that of Earth, and Mars, and over the asteroidal belt. Jupiter, 10,000,000 miles below, swiftly receded until it resembled a tiny, unhealthy looking orange. Uranus was elsewhere; they did not sight it. Saturn was far away, also. Then came Neptune, that aged, creeping old planet that makes a round trip of the Sun in 165 years flat! Pluto was too tiny and black and far away to make out at all.

And finally the cold black of interstellar space, with the misty curtain of stars and nebulae seeming so unbelievably far away.

Out, out, to distances that seemed incredible. Back stretched the beam, paid out like the rope attached to the harpoon attached to the whale, a tenuous link between ship and Earth. Stokers worked like mad to feed that colossal evidence of man's superiority over his universe. Tons and more tons of dense metal went into the atomic furnaces, were bombarded ceaselessly by billions of neutrons which, thanks to man's ingenuity, no longer operated on the principle of chance. Each particle did a definite job and a good one.

No one, except Anton and Riss, believed that that beam would hold without breaking up, but it did. It held true, slicing through the cold of space,

through the heart of the Sun, through the heart of the Earth. The most delicate problems had to be solved with a degree of finesse which would never have been possible to mathematicians of an earlier era. Exactness down to the fraction of a mile was necessary.

But one month after the beam had arrested the Earth, outward motion ceased. The long arm had a length of one thousand astronomical units; the short arm had a length of one astronomical unit.

And now Anton had his leverage, all the leverage he wanted.

"It's done!" he exulted, as the *White Dwarf* cut out the rocket jets which had been steadily thrusting them beyond the confines of the solar system. "I mean it's as good as done!" Zala smiled, as she caught the contagion of enthusiasm. He turned to her, lifted her far above his head, her small feet kicking against his chest. "By Heaven, Zala!"

He brought her down. She sank into his arms easily. He kissed her; she sighed wholeheartedly. Then he flung her from him, a snarl contorting his face.

But his expression softened, and he took her in his arms again. He could feel the beat of her heart against his chest.

"It's this way," he said gently. "I'm a pirate. My father was a pirate before me. He brought me up in those traditions. I owe love to no country or planet. I'm not helping the Earth out of any feeling of patriotism; it's just that I hate to see a perfectly good planet, and millions of years of evolution, go to waste. That's why I'm helping Earth, principally.

"Now I love you, Zala, you understand that. But I'm a pirate, and I've got bad instincts in me. So nothing like that would work. I'll die with a heat ray burning my heart out."

He released her, as if that were final.

She shook her head mutely, laughing. Then said, "You'll die on Earth, the greatest man and scientist of all history."

ANTON forced himself to smile at that, though his thoughts flamed at her frequent repetition of these allusions. What was she driving at? He growled to himself, and suddenly heard a dry, wheezing chuckle come from the pilot room.

"I heard all that, Anton," said Riss, grinning twistedly up at them in the vision plate. He turned his eyes to Zala. "Anton can move the Earth, I'll say that now, but you can't even dream of reforming him! That," said Riss, chuckling uncontrollably, "is the craziest thing I ever heard of!"

Then his narrow, red-shot eyes switched to Anton, and he shouted in a sudden spasm of apprehension, "Don't let her talk you into anything! You'll be making some crazy promise!"

"I've got my wits about me, Riss." Anton grinned and left Zala, went down a companionway, gathered together his mathematicians, engineers, and beam tenders, and conferred with them for an hour.

When Anton came up again, he said, "Twenty-four hours from now real operations start. All the planets will be in the most favorable position then—the beam'll weave right through them. We're going to lift the Earth right out of the plane of the ecliptic—well, no, the Earth's orbit *is* the plane of the ecliptic! Anyway, its orbit will be perpendicular to the present one."

She nodded gravely. "You can't," she asserted, "avoid errors."

"Doesn't matter. We can keep our errors down to the fraction of a mile, and with Earth on the short arm, that won't make any difference at all.

Mathematicians are plotting a curve now, which the Earth will follow in miniature. It's like a pantograph, you understand."

"How about the anvil sparks?"

"All figured in. The Earth will zoom out of them with about a week margin of escape, and where we're going to put the Earth that accursed hyperspatial sun of yours will never bother her.

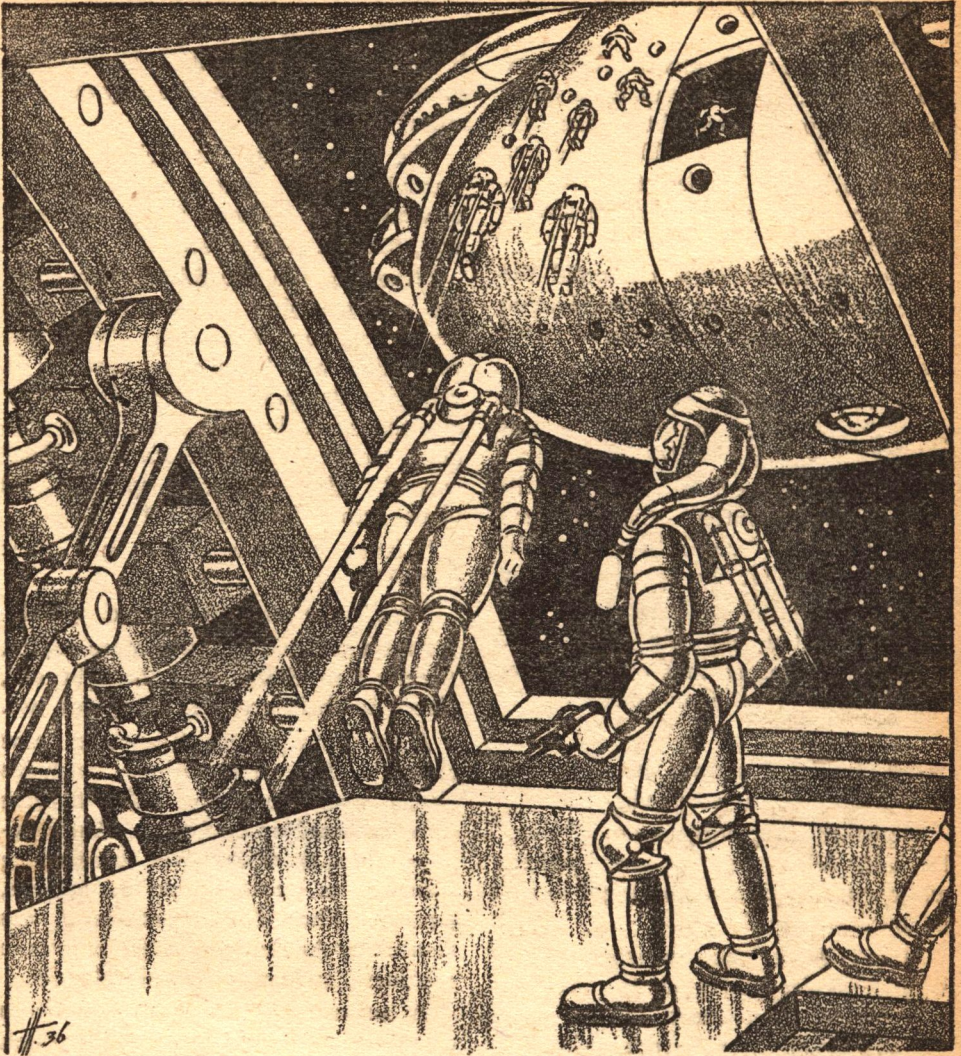
"And it'll be smooth," he added a few moments later. "The Earth will have to take on some acceleration, entirely due to change of direction, but it's going to occur so gradually that it'll be like sliding along a greased groove."

VI.

FOR NINE MONTHS to follow, Anton's great beam stabbed through blackness, down through an almost invisible Sun, through the totally invisible Earth, urged onward by inexhaustible power. The *White Dwarf*, moving with far greater velocity than any white dwarf had ever moved, and blazing like one from the reflections of all the stars in heaven on her smooth, white exterior, had such vast kinetic energy that, had she collided with some unseen wanderer from the infinity that stretched beyond the system, the bodies of all on board, together with humanity's hopes, would have been shattered.

She followed a long, arching curve, each component of which, however, had a different radius. For nine months she followed, and every day it became seconds of arc steeper. At the end of four months, half the fuel in stock had disappeared; the remaining half must suffice to displace Earth's orbit.

The Sun could not be distinguished, to say nothing of the planets. It was just another star, no different from any of the billion others which spangled the fantastic black of ancient space. A



A score of figures, rocket flames shooting, were vomited from the ship.

thing alien, a thing unknown to this true interstellar space, the *White Dwarf* knifed her way. It seemed incredible that it was she, and she alone, which controlled the motions of that tiny speck of matter known as Earth.

But the orbit of the Earth was being altered!

Now and then there were tremors in the ship as the kinetic energy of meteors and other celestial flotsam striking the

beam traveled up its length. Most of the collisions occurred near the Sun; the shock was quite negligible. Others struck farther out, but most applied positive rather than negative torques. The asteroids were a notable example; they merely supplied Anton with an extra source of power. But there had to be compensations, anyway, for above all the velocity and acceleration of the *White Dwarf* must remain things de-

terminated only by the will of the human beings within her.

It was in the ninth month when near disaster came, in the form of a giant comet, plunging in toward the solar system—at a velocity of 1,000 miles per second! Riss saw his detector disks excited into fluorescence, and immediately called Anton.

Anton as immediately contacted the telescope room, asking for verification and details. Back came the dreaded answer.

"A comet, Anton. Gigantic." He gave the distance, in round figures 75,000,000 miles. "Velocity, about 1,000 miles per second. I've got the hair lines on it, Anton"—the observer's voice trembled—"and it won't hit the ship. But it'll hit the beam, a million miles out."

"So." Anton suddenly grayed, and fingered the long strands of his yellow hair. "That gives us an hour."

HE jerked forward; his lean jaw hardened; his eyes snapped.

He called the plotting room. "You," he said deliberately to the suddenly white mathematicians, "have got to give us another curve."

"Can't do it," one whispered, eyes wide. "We're taking all the acceleration we can stand now. If we make our downward curve sharper, we'll all be crushed. If we increase it enough to escape the comet," he added, trembling.

"Be a good thing for you!" Anton snapped, and then jumped up, wrath transfiguring his face. "Do it!" he thundered. "By Heaven, haven't you got your senses about you, to question me? Do you know what will happen if the comet strikes that beam? Do you?"

"It'll apply a negative torque that'll smash you to pulp! The *White Dwarf* will tear herself into free molecules!

Going at 19,000 miles per second, aren't we? Then imagine what would happen if we'd stop stock still! How's that compare with your damned silly acceleration?"

The man's lips trembled. "The Earth'll stagger some if we apply it," he whispered. "I know it's on the short arm, but it'll stagger some."

"And what do you think'll happen if the comet strikes the beam?" Anton thundered, pounding a fist. "What do you think will happen to Earth? It will give the same effect as if a body one thousand times as massive as this giant comet struck the Earth! Tidal waves! Huge fissures, splitting the planet into a dozen chunks!

"Listen, now—will you plot that curve?"

"Yes," the man whispered weakly.

Anton sat back and gave more orders. Acceleration chairs were brought out, placed in their grooves, ready for use.

A half hour passed. The comet came closer. The integrating machines clicked away furiously. The answers came jabbered up to Anton. Anton relayed them to Riss, after interpreting them. Riss excitedly set his controls, strapped himself into his chair, was assured by Anton that everything was in readiness, and pushed in his plunger.

A pressure set in. There was a creaking and groaning of metal plates. Zala's eyes grew big. Something was crushing in her chest, breaking her bones, she was sure.

Anton turned his eyes to her, mutely offering help he could not give. Riss made a choking sound. A roaring came and went, like the wash of surf on the Atlantic. The acceleration chairs were sliding back, slowly, slowly, swiftly.

Zala cried out; the cry was throttled in her throat. Specks began to dance in panoramic array before Anton's eyes. Somehow he thought he heard beauti-

ful, aching music, but it was only imagination.

He forced himself back to consciousness, but he dared not turn his head to look at Zala, suffering mutely—had he, he might never have been able to get it back to its original position; the spinal column would have been wrenched beyond repair. One must sit straight, face the line of acceleration; that was the rule.

But now he could not even move his head. Something was holding it firmly against the cushioned back of his chair, which slid swiftly backward. And the whole universe was sliding, moving, shifting. He could see stars unnumbered. What was happening in the rest of the ship? Was the beam holding? A nebulae wreathed about. No longer. He couldn't hold on any longer. The whole universe slid away from his mind in a long string of swiftly unwinding stars. And then there was nothing—blackness.

EONS PASSED, and then there was a ringing. Things seemed to work in reverse order. He saw all those things, and heard that mind music. A roaring. Specks. He jerked. Consciousness came back. He dragged his eyes to the vision plates, looked for the comet. It was gone. Setting his teeth, he undid the straps that bound him, and rose unsteadily to his feet. There was no more acceleration.

He crossed swiftly to Zala, chafed her arms, unloosed her, was gratified to see the flush of returning life. He got some water for her, and then left her, rushing down to Riss. But it was many moments before Riss revived. Anton left him, also, and went into the luminologists' quarters. There had been four—now there were two—alive.

Subsequently, Anton went in to his mathematicians, and choked angrily. Their chief, who had objected in the

first place, had expired. Anton went down to the engine room, where some men, with powerful bones, and huge chests with strong hearts in them, were already moving, tending to their fellows. All were alive.

Anton went up with a heart heavy as lead. Somehow he wanted Zala in his arms. He kissed her, met her eyes for a moment, and sat down to his job again.

The comet had disappeared. They never saw it again. It was gone, and with it one hour fraught with terrible danger—and the lives of three men.

There was no more danger. All planets and asteroids lie more or less in the ecliptic plane. Anton's beam had skipped the superior planets, avoided the minors by hairbreadths. And now the *White Dwarf* blazed through space on its changed path, the ecliptic plane far above—or below.

The Earth continued to rise over its orbit for a few short days. Then it steadied, as the course of the *White Dwarf* steadied. Anton was not changing her orbit now, for that was done; he was putting her new one on a firm basis with the Sun.

Anton finally said to the remaining beam tenders: "Snap her off." And that was all. Anton's monster lever had done its work.

IT WAS a relieved world which listened to the pronouncements of the men who knew. Zooming along at something over nineteen miles per second, she slowly showed evidence of taking on a slant. Constellations now began to set whole seconds behind time. The Sun settled whole minutes behind time, but the Moon faithfully followed her age-old path. It was not that Earth's rotational rate was changing, but merely that she was rising above her old orbit.

Dreadful festers of fire, the anvil

sparks, came closer. Toward the close of the eleventh month of the year prescribed, they could be seen with the naked eye, a celestial vise which would crush the Earth in clamps of fire.

But they, too, began to set later. Each night they were displaced, but still they came on, strange sun fragments which yet were not fragments, undeniably plural, yet somehow singular. Panic rippled over the surface of the Earth; what if Anton Larval failed?

The Earth, however, rose higher, as if her orbit had of itself executed a half flip in midspace. The strange anvil sparks fell below, until all were flaming in the western skies. That fearful vise had been avoided, and now its teeth were clamping down on nothingness!

Uncounted telescopes were trained on that meeting, watching day and night. Crowds thronged streets unlighted save for that sinister glow. Calmly, the anvil sparks went on their ways, areas of vagrant fire separated from their blood brothers by the crazy laws of a crazy universe. They did not hurry. They never changed pace. Even when only a few miles of space separated them they showed no disposition to exert a gravitational attraction on each other.

But they changed shapes, subtly, as if each was preparing to fit snugly into the niche reserved for it. Distortions from hyperspace they had been, and now they were accustoming themselves to the geometry of an alien universe, in which straight lines seemed unbearably crooked, in which circles took on the characteristics of squares, in which every possible plane figure was distorted to an impossible shape.

They met—May 21, 2677 A. D., but it was disappointing. There were no wildly erupting gases, no blinding halo of flames. There was nothing. The anvil sparks fitted quietly into each other, as if each knew beyond a shadow of doubt its individual cubby hole. Their

individual edges dovetailed with an incredible nicety.

It was then that the startling thing happened. As if some terrible force had slapped that tiny, young sun out there, it leaped into instantaneous speed, streaked out away from the Sun, past the orbits of the inferior planets, past those of all the majors, and away out into space.

It passed Anton's ship as it crossed the orbit of Jupiter, and Zala stared at it with wide eyes.

"It must have been moving at terrific velocity when it broke from the confines of its own space," she said. "It didn't have any place to discard that momentum, just used part of it to squeeze through into this universe. The rest of it gave it that awful speed."

Anton watched it for a while, and then sat down, his eyes gleaming. He had forgotten the anvil sparks; he had forgotten Earth. He was thinking of the sheer excitement of a snap gun fight in midspace; of the blinding flash that heralded the blasting open of the ports of some stubborn freighter; of a rough-and-tumble fight in her companionways, heat rays punctuating the darkness; and lastly, of the treasures of which he would ransack her holds. He was thinking of these things intensely, so that when he suddenly met Zala's studying eyes, he let forth a whole-hearted curse.

"Zala!" He jumped to his feet, pacing the room, shaking his head from side to side, his long hair slapping forcefully against his shoulders. "Zala," he said tensely, "I've done my job. Earth has her new orbit. Our first-class lever has done its work. The whole plane of the ecliptic is turned around. Scientists will have to change all their methods of figuring. They'll have to change the length of the astronomical unit, if they want it true. They'll have to draw new maps of the celestial sphere. They'll

have to institute new hours, new minutes, new months, new New Years, new everything. Every scientific textbook in the world will have to be revised. I've saved the Earth, but I can't vouch for the size or shape of her new orbit.

"So ends a chapter.

"I drifted into your life, is what I'm getting at, and I think I love you, but all the same I'm going to be drifting out, and you're going to be drifting out of mine the same way."

He came up behind her, a disturbed expression on his face. "We aren't going to give way to our emotions like a couple of lovesick kids, are we? We know that nothing like that would work. That's so, isn't it? That's the best way—eh?"

"No, Anton," she returned, calmly, and turned around. She smiled bewitchingly. "You'll be back, Anton, and soon. I'll swear to that!"

Anton was suddenly furious. He grabbed a phone and snarled, "Riss! Rip space, old lieutenant, and get to Earth. And you can shave the Sun if you want to!"

ANTON'S huge shell of a ship landed on the plaza which gaped up from the heart of New York like the footprint of a clumsy giant.

One hour later he was face to face with the president of the World Union, who smiled, shook hands, and asked Anton several curious questions.

Anton felt obliged to answer them, and then said, "I'm free?"

"To do what you wish."

Anton laughed. "But you wish I'd stay on Earth, devote myself to something worthwhile. Well, sorry, but it's impossible." He started pacing the room in that nervous way of his. "Send out a call for my men. Every last one! We hit heaven at eight."

They "hit heaven" at eight. Anton's

AST—10

pirate ship lay in her cradle. Every man was at his post. Rocket jets had been inspected, repaired, cleaned. Metal work had been shined. Steering gear was ready for the touch of a man's hand. In a few moments she would leap like a live, shining thing into space.

Anton paid no attention to the shouting crowds. He stood in the airlock and said to Zala, "I'll be back sometime to stay a short while, Zala."

She smiled gravely and gave him her hand. "All right, Anton."

"Well, then," said Anton, "good-by!"

The airlock valve swung to with a groan and a whine. Five minutes later Anton's pirate ship soared upward with a belch of rosy flames.

VII.

IT HAPPENED in the Mars-Pluto Route.

Anton's ship had cut through spatial night for a few days, and finally landed on Titan, in a teeming pirate city in the densest, most inaccessible part of the jungled planet, a city much like the pirate-ridden Porto Bello of ancient Spanish Main days.

For some days Anton and his crew renewed old acquaintances, and made new ones. Having thus established their place in the true scheme of things, they left the little moon, and lay in wait in the ever-shifting Mars-Pluto Route; Anton had heard tales of diamond-bearing clay on the little outpost of the solar system, and he meant to take some of the uncut gems for his own.

They hung there for several days, exhibiting iron patience. Once the shadowy hulk of an Interplanetary Police Force cruiser occulted a patch of stars; but apparently they did not sight Anton's ship. This seemed rather incredible to the outlaw, but he at last attributed it to negligence on the part of the

watch. But somehow it annoyed him. Later his spirits were buoyed up by what the detector disks in his cabin were telling him.

His rumbling voice echoed through the intership communication phones.

"Telescope, verify signs of approach of merchanter, radiant point Aries."

"She's coming, all right," spoke up the observer in the turret.

"Then, to posts!" Anton roared. "Harnesses on! My detectors tell me a thing or two of interest: she's big, and she ought to have a mess of jewels in her holds."

Anton's orderly came in, helped him on with a space suit, buckling a flame pistol around his waist. There was a tingling in Anton's veins, a glorious foretaste of adventure and battle to come. His eyes gleamed. "Bismarck, ready the ten-incher. A blow to the fore plates of a ship is enough to send her inmates spinning into confusion.

"Later, Johnson, we may have to slice her propellants away from the rest of the ship, so see that the generating equipment's in good order. These burly freighter captains have a resistance in the face of overwhelming odds that sometimes makes a man sit up! Boarding crew, airlocks! They'll be playing force beams on us, but the moment I let the screens down, you have to beat it across—that's when they can do their worst. But if you go at comet speed, they'll no more than take the ship's skin. Comet speed!"

Anton watched a vision plate, in which a tiny speck of light was growing with startling speed. He watched closely, and when it suddenly started to lose in size, which indicated its apprehensive retreat, Anton barked joyously to Riss. The ship quivered down her entire length, as she let out a fusillade of rocket flares that drove her into swift speed. Anton's grooved chair slid

down on its compressed air cushion for several seconds as acceleration continued.

Rapidly the retreating speck grew in apparent size.

Not long after, Anton hailed the cornered freighter, and later was gloating into a vision plate which showed him the interior of a control cabin, a huge man with a captain's dirty uniform staring back at him. Behind him fidgeted several officers, hands tightening on flame pistols.

"Well?" bellowed the man in the plate, his lips curled. "You damned dirty pirate, what do you think you want? By all the stars in heaven, I'll slice you down your main beams!"

Anton replied laughingly, "What do I think I want? I think I want to inspect your holds!"

"Hah! That will be difficult, indeed! There are certain things one must do to——"

HE SUDDENLY PAUSED, his eyes widened. "You," he said in a different tone, "are Anton Larval."

Anton inclined his head. "My hair," he agreed sadly, "marks me."

"Then come aboard!" The captain's face underwent a startling transformation. His bellicose manner was lost in a sudden flood of joviality. "Anton Larval! By all the stars in space, why didn't you say so! Come on, come on! You!" He jerked a finger at an officer. "It's Anton! You know what that means? Open all ports, and make Anton welcome!"

"Anton," he exclaimed, "you wouldn't believe it! My hulls are loaded with stuff that blazes like the heart of a star!"

Anton smiled derisively, and carelessly watched the flanks of the other ship. A row of ports opened inward, revealing lighted, inviting interiors.

"Don't be a crazy fool!" Riss snapped excitedly. "It's a trap!"

"Maybe it is, but since when couldn't I handle a trap?"

"It's not a trap, Anton!" retorted the man whose vast bulk filled the vision plate. "By Heaven, you come aboard!"

Anton frowned, looked at him for a long moment.

He said calmly, "You must be part jellyfish."

"By all the stars of space, Anton! You're welcome!"

Anton sat very still, then said quietly, "Airlocks, open! Ready! Screens off! Flare!"

A score of figures, rocket flames shooting from the shoulders of their suits, were vomited from the ship, like a cluster of fire flies. Anton tensed, smiling to himself, and ordered the screens on again. Nothing happened.

Anton's men disappeared into the freighter's interior.

Still he waited. Something sickening, some horrible premonition, flashed through his mind. He whitened, clutching the arm of his chair, as if he were clutching at a last hope.

"Coward!" he said softly. "I'll be across, commander, and I'll tell all the boys on Titan about the man whose blood turned to water."

He thought that would anger the man, make him flare in white-hot ire.

But the other merely bellowed, "Come across, Anton, come across! Not a thing to fear! Take what you want, and bless you!"

Into view came one of Anton's men, smiling coldly, a flame pistol bearing on the little group in the control room.

"Sure, come across, Anton," he said carelessly. "You won't find much resistance here. This fellow's ancestors were all women."

Anton rose slowly. He heavily left

the room, descended a ramp, entered an airlock. A few moments later the screens went off long enough to allow him access to space. He floated across to the merchanter.

A deck hand met him and led the way, finally debouching into the control room, a dozen carelessly garbed officers and their captain facing him.

THE CAPTAIN came across and held out his hand, which Anton ignored. He carelessly threw a glance about the room, then met the other man's eyes.

"In all truth," he murmured, "it tears my heart to see a man in your condition. Those scars must have been got from your wife?"

"Not at all, not at all. I got 'em at one time or another, beating off pirates. I've done some fighting in my day, Anton. So you saved the Earth, and for a pretty fee, too! By all the stars in space, it's the life for a buccaneer! I've half a mind to join you, I'll swear!"

"Wouldn't have you," Anton rejoined shortly, then painfully, "What's the answer? Isn't there a man among you who'd fight a damned stinking pirate? Has all the red blood run out of you? Speak up!" he thundered in sudden fury.

"Now, listen, Anton, I'm certainly not the kind of fellow that runs when the stars begin to split! But the president send out this interdict: 'Leave Anton Larval alone,' he says. 'Anton,' he goes on, 'saved the Earth, and it's the least thing we can do to show our appreciation: to give him freedom unlimited! What you have, if he wants it, is his.'

"That's what he said, Anton, or something like it, and you sure can't blame me!"

The outlaw suddenly seemed gray. He absently plucked at a lock of his long hair, and his shoulders suddenly drooped. "See if there's anything of

value," he told his men. "Just pick up the big stuff."

"Take it all!" expostulated the other. "It's yours, Anton, believe me!"

Anton smiled coldly. "Who's this charged to?"

"World government, of course."

"Certainly, and you'll fake accounts, mix in with the right officials, and rake in a few thousands for yourself!"

The other man reddened, cast a swift glance at his officers, and then back at Anton. A choking fury contorted the ropelike muscles of his throat.

"You—you——" he bellowed.

"Yes, yes, go on?" Anton urged him politely.

A hairy fist suddenly clotted into a knot, and with a snarl of animal ferocity, the captain lunged across at Anton, murder in his fists.

Anton carelessly side-stepped the swinging mallets, and put his own not inconsiderable weight, plus a vast swiftness of motion, into his clenched hand. There was a crack, a sickening crunch of bone. The recipient of the sledgehammer blow sprawled backward, fell with a thud to the metal floor.

"That," Anton decided aloud, "was just what I wanted."

He threw a casual glance around at the other men in the room, walked from it, down a companionway, thence across the void to his ship. He stood in the airlock a long moment, thinking.

That was *not* what he had wanted. He had wanted something else. Jewels had been secondary. While he had been moving Earth, with his monstrous variation of the lever, he had dreamed of this first assault. Heat guns spitting, men grappling, stars whirling dizzily, and victory! Well, here he was—Anton Larval, a name to send fear into a man's heart! But now they were instructed to treat this bold bad man with utmost courtesy and respect.

IT WAS some weeks later. Anton sat in a chair in the lounge; around him were Riss and the other officers.

"You wouldn't believe it, Anton," cried Riss in a desperate voice. "The holds are stacked! A lead tube of radium, even. If you want to quit for a while, all right. We can live like gods, and then come back to it."

"We have to give that radium back to Earth, Riss; they need it. But divide the rest up amongst yourselves. You can live like gods; but I like to fight for what I get, and—the damned stuff's tainted. I won't touch it.

"You have to listen to me. I saved the Earth, and in return the president gave me freedom. He said, 'Freedom such as no man ever dreamed of!' Those were his wits working, when he promised that, I may say! Look how it is. That last freighter—there was an Interplanetary Police Force cruiser not a unit distant, and she knew what was happening. But did she show her teeth? She did not! 'Hands off Anton Larval,' says the world president, and that's how it stands.

"The second a merchanter sights us, she'll halt, the commander will establish vision, he'll doff his cap respectfully, bow politely, and say, 'Hello, Anton! By the way, there are a few millions in uncut gems stacked in my holds, yours for the taking!' That's how it stands."

"A filthy trick," muttered Riss angrily.

"So I say, take my ship, and go your own way. With me gone, you'll drift back. Fight, that's what you like. But me? I'll go back to Earth, and do what the president wants me to do—reform."

There was a concerted gasp of incredulity.

"You reform?" gasped Riss. "You can't do that!"

Anton rose, and sneered at him. "You're always saying I can't do things!

I turned the Earth's orbit upside down, didn't I?"

"Certainly, I know, but——" Riss waved his hands helplessly, and brushed his few strands of red hair with a distracted hand. "But that's something a man can do; I never said it was impossible, but—it's the craziest thing I ever heard of!" he exploded.

"Hyphenate yourself, Riss," Anton said softly. He stroked his long hair abstractedly. "I'll reform, and I'll do what the president wants me to do—put my abilities to some account. And by Heaven!" he exclaimed, "I begin to work up some interest in the task!"

"You're thinking of that girl," said Riss bitterly.

"Thinking of her?" Anton's eyes were speculative. "Riss, you don't know the part of it. There's a print of her on the sensible fraction of my brain, and her eyes just keep on boring into mine. So I'm going to lead this new life; but she's worth it!

"Now rip space, old lieutenant, and put Earth on your course!"

Riss bowed his head mutely.

Anton jumped up, and clapped him on the shoulder with some force.

"You heard me, Riss! Now who is commander around here, I should like to know!"

Riss raised his head, a shine in his eyes. "You are," he whispered huskily.

"Certainly I am! But you seem to forget it. Now listen, Riss, are you going to put Earth on your course?" He tried to say more, but the words wouldn't come.

Riss nodded mutely, and left the room, the other men trailing slowly behind him.

Anton sat down, suddenly pensive. He looked at Earth, a bright dot. Somehow or other—he couldn't for the life of him understand why—there was a lump in his throat. He finally decided that he was thinking of Earth and the new life it held for him, and nothing else at all.

Statement of the Ownership, Management, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Astounding Stories, published monthly, at New York, N. Y., for October 1, 1936.

State of New York, County of New York (ss.)

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared George C. Smith, Jr., who, having been duly sworn according to law, deposes and says that he is President of Street & Smith Publications, Inc., publishers of *Astounding Stories*, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

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GEORGE C. SMITH, Jr., President,
Of Street & Smith Publications, Inc., publishers.

Sworn to and subscribed before me this 30th day of September, 1936. De Witt C. Van Valkenburgh, Notary Public No. 16, New York County. (My commission expires March 30, 1938.)

Let's Get Down to BRASS TACKS



AN OPEN FORUM of CONTROVERSIAL OPINION

Sometime Put a Good Razor Edge Under a High-Powered Microscope.

Dear Editor:

I have a few ideas that I must get off my chest, hence this letter.

First: *The Return of the Murians*, Page 75. Quote: "Sparks crackled blue from the plane's aerial." Sparks do not crackle from the antenna of a transmitter. It takes considerable power to produce even a faint corona discharge.

Second: I disagree with the Brass Tackers who advise you to print one sort of story and throw another sort in the wastebasket. They forget that there might be two people who read *Astounding Stories*. They forget that taste differs. Personally, I'm very much surprised when I like all the stories in any one issue, but that doesn't mean that the stories I didn't like are not good stories. On the contrary, in many cases they may be better stories. But I leave them, happily, to those who like them.

Third: *Mathematica Plus* intrigues me. I can understand the infinite expansion of a given term but, assuming the expansion regular and according to given laws, how does one account for imperfections and failures such as are found in this world?

Another thing: I understand the expansion of an identity, but what results when you set up an equation having a real, finite, numerical solution? How can that be expanded? I should think the tendency would be to solve it, not expand it.—Robert A. Langevin, 411 Carthage Road, Toledo, Ohio.

Says Skylark Stories Not So Good.

Dear Editor:

I have intended to write for some time, but never could think of anything to write. But now I think it is time I voiced my opinions. I have read *Astounding* for almost three years and I think the best story ever to appear in it was *I Am Not God* by Nat Schachner. Second best was *Twelve Eighty-seven*. Many writers have commented on how good the Skylark stories were. I don't think they were so hot. Probably the worst story was *The Machine*.

Spawn of Eternal Thought was swell. So was

Mathematica Plus. *The Cometeers* was very good, but couldn't rank with *The Legion of Space*. But I think that *The Red Peri* was great. Please get a sequel for it. How about a quarterly or semimonthly? Congrats on the trimmed edges.—R. L. Primoff, R. F. D. 2, Peekskill, New York.

He Doesn't Like Serials.

Dear Editor:

For a long time I have intended to write you, but never seemed to get around to it. Ever since a friend handed me a copy of *Astounding Stories* about a year ago, I have been one of your silent readers. The magazine has pleased me very much, and when I am satisfied I prefer to remain quiet.

But when *At the Mountains of Madness* by H. P. Lovecraft was published, I was very much disillusioned, disappointed and disgusted. The endless description and monotonous repetition was more horrible and more hideous than his monsters. It taxed my patience to the limit, but somehow I managed to drag through to the finish. A story to be good, in my estimation, must grip the interest of the reader from beginning to the end. And if it is all description, or most of it, I cannot even class it as a story, and it certainly holds no interest for me.

Lovecraft reminds me of a politician who loves to hear himself talk and tries to impress his public with his knowledge of something they do not understand. And when I read in the previous issue that Lovecraft would have another story in the June issue, I did not even purchase it. I would rather miss the whole issue than drag through another of his "masterpieces."

But since then I have read the July and August issues and am happy again. I've just finished reading *The Cometeers* and I think it was an excellent story, although four months seems like a long time to run one story through. Two months should be enough. Have less short stories if necessary. Most all of your serials, novels, novelettes have been superb, so will not mention any others in particular.

As for the covers, drawings, smooth edges,

etc., I will let others praise or criticize them; they do not bother me.

And, in closing, I wish to add my voice in praise of one whom we all miss. Stanley Weinbaum was truly a great writer of science-fiction and he has left a void in the pages of *Astounding Stories* that will be hard to fill.—A. J. Pisila, Box 324, Mason City, Washington.

Another Analysis.

Dear Mr. Tremaine:

Just a line to let you know I'm still alive and kicking. The July issue was one of the best yet. Lorne is improving; *Australano* was intriguing. A possible successor to Stanley G. Weinbaum, although I still think that Manning is the logical one.

Just a trifle too much description in *Pacifica*. I think it was to cover up a weak—for Schachner—plot. The basic idea was good but rather pulled out.

Frictional Losses: A splendid tale and splendidly worked out in the best Stuart manner. Don't you agree with me that double-page illustrations improve the look of a story?

The Train That Vanished: Why did you not term this a thought-variant? Splendid mathematics which I hope gives a fillip to discussions, though not of the type that typified the conversion of energy theories. That was undignified—very.

Permit this humble scribe to say that he could not see the basic idea behind *The Time Decelerator*. I think a letter from the author explaining more fully would be in order. What do you say, umpire?

The Virus: Splendid yarn; could have well stood being a nice long novelette. The idea made shivers run up my back, though.

The Cometeers: coming on nicely. Williamson has kept up the character of Giles splendidly.

For goodness' sake, drown Dold, Saaty, and Brown. Get Paul to do the cover and some of the mechanical drawings. Leave the figure illustrations to Wesso and the extra terrestrial scenes to Marchioni, with an occasional one by Thompson for relief.

Jack Darrow: How could you? You've gone down two points since that amazing statement. I liked *At the Mountains of Madness*. Come, point out to this poor brain the science in it. I usually think you are the most sane contributor to discussions, but this time don't you think you've slipped?—L. Chester, 12 Amberlyten, Leeds, England.

few issues have been really poor, but all of Gallun's former stories that I have read, with the exception of *The Weapon*, have been a hundred times better.

Black Light: Tales of enemy nations making their agents, spies or armies visible only to infra-red or ultra-violet light are old in science-fiction, but that picture is new.

Mercury: This article and its predecessors were one of the best things in their respective issues. I hope and think that the rest will be as good.

Proteus Island: I am sorry that this is Weinbaum's last story; it was very good. I like most biological stories.

The Cometeers: The best installment yet, and that's saying plenty.

Kenneth Sterling: I will miss Daniels, though I read only one of his stories.

Andy Aprea: *The Chrysalis* was no more "fantastic" than the average science-fiction story. If you are referring to the unsolved mystery, let me remind you that some mysteries of science—and especially archaeology—remain unsolved.

J. H. Pfnsohl: It is not known whether the temperature on Jupiter is very high or very low. In any case, no human could live on its surface as in *Blue Magic*.

Before I close, let me congratulate you on the progress *Astounding* is making.—Robert G. Thompson, 240 Barrington Road, Upper Darby, Pennsylvania.

We're Looking for Smith in 1937.

Dear Mr. Tremaine:

For once a word of praise: The July issue was practically perfect, the best this year. August issue nearly as good. Don A. Stuart is a top-notch. Give us more of him. He hasn't written a poor story yet, and I don't believe he ever will. Also glad to see articles by the one and only John W. Campbell, Jr.

Say, those Wesso illustrations are swell. After seeing the August issue, I don't see why people rave so over Dold. Wesso is tops! Give him more work to do; he improves with use.

Lovecraft's stories are masterpieces. It is a pleasure to read something that is well written instead of slam-bang action.

Three cheers for the return of Murray Leinster. Now give us E. E. Smith, Ph. D. You're hitting the best pace now since 1934.—Milton Harles, 233 Perry Street, San Francisco, California.

Pleased With "Our" Magazine.

Dear Editor:

With the August edition of *Astounding Stories* I have completed five years of pleasurable science-fiction reading. The first time I ever entered the enticing realm of imaginative fiction was through the pages of the old *Astounding*.

Since that time science-fiction has had its ups and downs, and it is with a great deal of pleasure that I note your magazine to be still going strong. When publication was stopped I feared that I had lost my old friend, but with its resumption some years ago, my fears seemed to be groundless.

The quality of stories appearing in *Astounding* is, in my estimation, the best of "all three," and though at times some of the stories fall below par, the average is sufficiently high to maintain a keen interest.

In reading the August issue of "our" magazine, I was pleased to find one of the best balanced editions in some time. Stories of the type of *The Return of the Murians* are extremely interesting, although the amount of science is nil. *Proteus Island* is an example, on the other hand, of the predominantly scientific. Stories like *A Leak in the Fountain of Youth* should appear more often, as they lend

Astounding Progress.

Dear Editor:

Some time ago I promised you that my next letter would contain a new idea. Much as I believe in keeping promises, I am dying to comment on your wonderful August issue, and I can think of no idea to go with it. I may think of one later, so don't give up hope.

Meanwhile, the impressions of the August issue:

The Incredible Invasion: Fairly good, but don't think it can ever compare with *Blue Magic*, *Spawn of Eternal Thought* or *The Cometeers*.

En Route to Pluto: An interesting speculation on how Martians and Earthians would get along together.

A Leak in the Fountain of Youth: What I like best about it is the way the title fits with the story. Outside of that, the story can only be praised for the fact that it is amusing.

The Return of the Murians: With the possible exception of *Proteus Island*, the best story in the issue. It cannot be denied, though, that it needs a sequel.

The Scarab: None of your stories in the last

a certain spice to the magazine that is highly desirable.

I agree with the Evanston reader that more editorial comment should appear in Brass Tacks. And, in conclusion, might I add my voice to the throng now clamoring for a quarterly?—Bill Parry, Box 96, Pacific Palisades, California.

A Discussion of Speed.

Dear Editor:

I was so pleased by the appearance of your August issue that, for the first time in a long while, I read the magazine through from cover to cover without omitting a single thing. Here are the features which pleased me most:

There were nine drawings by Wesso in the issue! Whoopee! It's beginning to seem as if our wildest dreams were coming true. I notice that nearly all the other readers like him also.

Brown's cover is the best he's done this year. If you leave out his black-and-whites, I may even learn to like his work.

The list of authors contributing to this issue is magnificent! A story by Murray Leinster illustrated by Wesso! The combination proved irresistible, and, contrary to my custom, I started a serial before having all the parts. I thought *The Incredible Invasion* by far the best in the issue.

Proteus Island was second-best, and was written in the good, old Weinbaum style. *The Return of the Marians* was merely a new twist to an age-old plot, but was fairly well written. It was about on a par with the conclusion of *The Cometeers*. A *Leak in the Fountain of Youth* was an excellent humorous story. *The Scarab* was good, as was *Black Light*. *En Route to Pluto* was a bit too asinine and mildewed and ridiculous to be very interesting. However, it wasn't exactly poor. John W. Campbell, Jr.'s articles are very interesting.

I notice letters in Brass Tacks saying that Marchioni can draw machinery. I wish to disagree. A second look at Marchioni's "machinery" shows them to consist of exactly nothing. A mass of bulbous tubes and eye-rending angles is not machinery. Never, in any of Marchioni's machinery can one recognize a single piece of rational, scientific apparatus. Neither can Marchioni draw architecture. His depictions of cities are almost nauseating. If all detail were ignored, and only the vague general effect considered, Marchioni would pass as a good artist, but not otherwise.

Mr. Cameron D. Lewis criticizes Stanley Coblentz's physics, but I believe Mr. Coblentz is still right. To get away from the Earth's attraction without using more power an object would have to have a speed of about seven miles per second at its starting point, the Earth's surface. But this speed would constantly diminish as it rose higher, reaching zero at a point just beyond the feeblest attraction of the Earth. But its average speed would be much less than seven miles per second. Dividing the distance of 600,000 miles by the time, 45 hours gives us the average velocity and not the starting speed.

Perhaps, Mr. Editor, I've already taken up too much of your time, so I'll close now by saying that the schedule for next month looks good—especially Neil R. Jones.—Oliver E. Saari, 1427 Logan Avenue North, Minneapolis, Minnesota.

From South Africa.

Editor, Astounding Stories:

More gurglings from fanatics writing for the first time. We think only one letter has been received from Africa before. In the past year the best story was *Mathematica*. What about a sequel to *Derehict*? *Spawn of Eternal Thought* was excellent.

The April and June covers were Howard V.

Brown's masterpieces. But wrap your tentacles around this: for inside illustrations he is not so hot and he does not even trouble to read the text thoroughly. Unpardonable!

Marchioni is definitely your best illustrator. This can be proved by comparing his drawings in *Mathematica* with those in the sequel by Schneeman. Wesso is the next in excellence. While we're speaking of illustrating, wouldn't it be a good idea to tell us the artists' names who do the pictures, as some don't sign. Also, in the little spaces at the end, why not put in a drawing relevant to the story?

Your magazine is definitely in the lead now, especially after the coming of the smooth edges. All we need to be perfect is an answer to the letters. Come on, boys, yell for it. Our magazine is high-class—even the ads. Let's make it top-class.

The best authors are Van Lorne, Coblentz, Fearn, Binder, Stuart, and the late king of them all—Weinbaum! Lovecraft isn't as good as he's cracked up to be. We like stories with themes dealing with chemistry best. The best stories, of course, are the thought-provoking ones, such as *Mathematica*. It's always interesting to hear from Darrow or Willis Conover, so print all letters by them, please. Try also to print a few humorous stories. Well, we hope you grant some of our petitions.—S. Stein, C. Kaplan, R. Smith, 297 Cato Road, Durban, South Africa.

We Set the Pace—We Don't Follow Others.

Dear Editor:

The best rating I can give the August issue of *Astounding Stories* is "good." The best story in the issue by far was *The Scarab*, which I found most interesting. Having finished *The Cometeers* I pronounce it good, but it is not half the story that *The Legion of Space* was. I want to thank Willis Conover, Jr., for his kind letter and information contained therein, for which I am very grateful.

I notice that science-fiction is being pulled down to the class of dime thrillers by one of our so-called rivals. This is a very regrettable occurrence, as science-fiction belongs on a pinnacle and should not be allowed to be dragged down by a falling brother. Hoping that *Astounding* will never drop so low.—Lyman Martin, 65 Howe Street, Marlboro, Massachusetts.

Another Tribute to Weinbaum.

Dear Mr. Tremaine:

Thanks lots for publishing my letter in the August Brass Tacks. Here's hoping this one goes there, too.

But I want to thank you more than ever for letting Wesso illustrate seventy-five per cent of the issue. He used to draw silly tight pants on his men, but now I can't tell any difference between his characters' clothes and real, everyday ones. I surely wish you would let him paint a cover picture soon, even though Brown's cover picture this issue wasn't so bad. But I'm sure Wesso could do better than Brown does.

Proteus Island, by Weinbaum, was a fitting conclusion to this unfortunate author's career. I hope you do all you can in the way of unearthing any unpublished manuscripts of his. In my estimation, he was one of the very best scientific-fiction authors. It seemed that he wrote like Wesso draws. That two-page picture for the story just fitted it perfectly, and both story and picture were typical of the "good old days."

The Cometeers ended beautifully. Please don't have another sequel in this series, as it would spoil the whole works.

By the way, I think Thompson is better than Brown on inside pictures. Well, the August issue was the best yet. Hurry up with the

September issue. I hope *The Incredible Invasion* concludes next month, as I can't wait to finish it.—Morris S. Dollens, 126 12th Avenue, North St. Paul, Minnesota.

Science Articles Find Favor.

Dear Editor:

Up to date I have written a number of letters to you and intend to try and send you one each month, giving my thoughts on each issue. I certainly wish you would answer the letters in a little paragraph below each letter. To the readers: If you want your editor to do this, why don't you give your opinion, and perhaps he will.

Upon getting the August issue of *Astounding*, I turned through the magazine and mentally selected the stories that I thought would be best, and they turned out just like I figured.

The Incredible Invasion is going to be a whopper of a story. I can hardly wait to read the rest of it. Think I'll just start all over.

I didn't find *En Route to Pluto* such a good science story. As a plain story it was pretty good and even funny in places, but as a serial, as a science story, well—

I think the readers of *Astounding* will find *A Leak in the Fountain of Youth* very good. It is a new kind of story, not a new thought, but the way it was written made it seem so. Let's have more of A. R. Long's stories.

The Return of the Murians is a very good story and provides a base for an equally good sequel. Nat Schachner is getting better and better.

The Scarab: rather good.

Black Light: on the average.

You made a hit when you introduced the series of articles on the solar system, written by John W. Campbell, Jr. Let's have more of them.

With the characteristic fashion of Stanley Weinbaum, *Proteus Island* hit a new high. *Proteus Island* rings down the curtain of one of the most outstanding writers in science-fiction. A few months ago I noticed that Weinbaum's stories were to be put into book form on condition that enough readers wanted it so. Well, I cast my vote for it.

The Cometeers was brought to an ending with a striking climax. The last installment led up to the ending in such a fashion as to fairly take your breath away. Here's to Jack Williamson and long may his flag wave—and that goes for *Astounding Stories* double.—Calvin Fine, Box 441, Kilgore, Texas.

Wants Correspondents.

Dear Editor:

Recent improvements on both the quality of material and the structure of the magazine itself occasion me to express my heartiest congratulations. The trimmed edges greatly facilitate the filing of *Astounding Stories* and add to its character. The illustrations too, are excellent. Wesso did a very fine piece of work in his second illustration for Manley Wade Wellman's *Outlaws on Callisto*. Notice the fire in Hall Tarrant's face, the life in his arms—a vivid picture.

But most superb are the stories themselves. Adventure, science, fantasy, mystery—each plays its part in creating a powerful and gripping yarn. *Spawn of Eternal Thought* was remarkable. H. P. Lovecraft produced a well-written fantasy with *The Shadow Out of Time* and Williamson's *The Cometeers* was one of the best in a long time. Stanley Weinbaum's *Proteus Island* was another chef-d'œuvre.

Stories in which theoretical physics—Lorentz-Fitzgerald contractions, relativity, quanta, etc.—and astronomy provide the scientific basis interest me most. Transdimensional yarns and tales of time and time travel are of this class.

Many readers complain of time-travel stories as being ridiculous but, to use your phrase, "Perhaps we dream—but we do so logically, and science follows in the footsteps of our dreams." Life itself to some persons is ridiculous. To others it is a very serious thing. So with science and with science-fiction.

If, by any chance this letter should reach Brass Tacks, I want to make an appeal for an English- or French-speaking pen pal residing in the West or in any foreign land. I am eighteen years old and am interested in theoretical physics, astronomy, protozoology, photomicrography, and other sciences in general. I am also a collector of United States stamps.—Wilbur James Widmer, 679 Park Avenue, West New York, New Jersey.

Lightning Continues to Strike.

Dear Editor:

I hope this will appear in Brass Tacks soon for the benefit of Mr. Cassius Peacock and many others who have written, deluging me with indignant cries that lightning strikes up. Brothers Peacock & Co. have forgotten one important fact. I should like to remind them of a certain Mr. Benjamin Franklin of the United States who, one stormy night, flew a kite with a damp string. The lightning spark was conducted down the damp string and was earthed through his body. Thus was born the first lightning conductor. If lightning strikes upward, Cassius, how do you account for conductors, and buildings being struck. If you say that lightning runs up the conductor, lots of people are being struck this minute who are carrying steel-shafted umbrellas, golf clubs, etc.

Astounding, I think, is on the down-grade, at least this month. *The Train That Vanished* was the best for July. It had the best drawing, too. Thank you, Mr. Saaty.

Schachner should get a fresh plot. How many of you remember *Revolt of the Scientists and Stratosphere Towers?* Just two years ago.

I join with Jack Darrow of Chicago in asking for Paul; you know, the chap who illustrated science-fiction? By the way, *At the Mountains of Madness* was a trifle reminiscent of Poe's "Arthur Gordon Pym."

A story by Dr. David H. Keller would be useful. I am glad to see you have cut down the number of advertisement pages. I thought that you were going to continue giving next month's stories in advance. Summing up, I can only say *Astounding* is sliding badly. Only one story amusing—and that pretty poor—out of seven or so won't do.—Francis Ellissen, 6 Cardigan Road, Richmond Hill, Surrey, England.

Paradoxical Comment.

Dear Editor:

The major stories in the August issue were all well worth reading. Murray Leinster's *Incredible Invasion* starts out nicely. Leinster can be depended upon to put out first-class tales. I still remember his *Mole Pirate* and *Proxima Centauri*.

Proteus Island, by Stanley G. Weinbaum, was realistic and interesting. It certainly was too bad Weinbaum had to pass on. Within a space of twelve months he became the leading science-fiction writer. What would he have done in two or three years?

Nat Schachner's *Return of the Murians* was good. Schachner has the knack of making most of his yarns entirely plausible and true-to-life.

None of the shorts amounted to much. I disliked particularly Long's *A Leak in the Fountain of Youth* and W. West's *En Route to Pluto* because these tales had a tendency to be silly. If there is anything that doesn't belong in science-fiction it is foolish fantasy.

Jack Williamson's *The Cometeers* can be

summed up as fair. There was nothing wonderful about the novel and neither was it poor.

The articles on the solar system by John W. Campbell are very instructive. Campbell's science is many times better than his fiction ever was.

Howard Brown has another good cover to his credit. The best part of the fifteen inside illustrations was the fact that H. Wesso did nine of them. Wesso should always do most of the drawings because he is the best interior artist Astounding has ever had.

Nearly every science-fiction writer of note is now with Astounding. Only two are missing—Lawrence Manning and John Beynon Harris. Both authors have turned out fine stories, but I haven't seen their work for some time.—Charles Pizzano, 11 Winthrop Street, Dedham, Massachusetts.

A Good Point on "Glagula."

Dear Editor:

I have a bone to pick with the guys who rapped *Glagula* on the following points in the August Brass Tacks:

Charlie Pizzano says that it doesn't seem logical for a being to conquer space and not know anything about fire or frost. But what if, say, he came from a planet where some radio activity maintained a constant temperature? He would not have had any chance to learn of differences in temperature and this might have been his first space trip. And he says that "no space voyager would step out onto a strange planet without first testing the temperature." Now, if he didn't know of such a thing as changes in temperature, he wouldn't have instruments or knowledge to test it.

If these rappers of *Glagula* care to joust a bit, I wish they'd write me at the below address: That is, if you decide to print this, Mr. Editor.

Say, one of your rival "pubs" boasts that it is remarkable how their authors stick with them. After glancing through one of their magazines I conclude that this is true, because that kind of story would be accepted by no other magazine!

I enjoyed the August issue quite a little but will not list the stories in order of merit for various reasons.

Keep on giving us new authors as well as our old favorites, good stories, and good illustrations, and we'll get you new readers. I try to get one new reader per month, and am ahead quite a bit for this month. I always buy two copies every month, use one for lending purposes and one to file away. This is a pretty good idea for those who are reluctant about lending their copies. Give us back Hawk Carse and I'll stand by you always.—Hugh McKenna, Jr., P. O. Box 734, Seaside, Oregon.

Hissing Is Part of the Fun.

Dear Editor:

The Brass Tacks in the September issue of Astounding Stories was quite interesting. Perhaps this was because I seldom read it thoroughly.

It seems as if Kruse is finally being objected to. He has disgraced the pages of Astounding too long already.

Lovecraft is also being hissed at. This I do not understand. I did not read his *The Mountains of Madness* since I had only the first and last installments. However I did read his *The Shadow Out of Time*, and how people can complain about his perfect description and fine writing I do not know.

Now for the September issue: *Finality Unlimited*: fair. *Deserted Universe*: one of Fearn's best. *The House That Walked*: poor. *A Beast of the Void*: good. *Follow the Rocket Trail*: best short story in three issues. *The Song*

From the Dark Star: fair. I'm waiting for all of *The Incredible Invasion*, so cannot judge it. *Little Hercules*: very, very good. If Jones writes this good, keep him. The science features are better and better. Ask Gallun for a sequel to *Derelict*.

As to illustrators, Dold does not look so good to me as Schneeman. His illustration on Page 149 was perfect. Wesso is good, but I don't like Flatos. Whoever illustrated *Follow the Rocket Trail* is very good. Why aren't there more stories like *Mind Over Matter*? *Little Hercules* looks like it needs a sequel. Yours for Lovecraft.—Jack Ryan, 2131 Lake Drive, Grand Rapids, Michigan.

Wandrei Tops!

Dear Editor:

The best story in the issue was Donald Wandrei's story *Finality Unlimited*. This story reminded me of Wandrei's former type of story—thought-variants. It makes me shiver to think of what power one man could have.

Neil R. Jones' debut in Astounding Stories is very successful. At least to me it is. But why did he have to end it that way? Any one can see that the story was broken off. Boy! That story certainly needs a sequel.

When I read the title *Follow the Rocket Trail* I thought for a moment that Van Lorne had followed C. B. Kruse's despicable style of writing. However, I was reassured when I read the story.

Dold's illustrations for *Little Hercules* are superb! And also are Wesso's for *The Incredible Invasion*. If you ask me, I think you should drop all the other artists and let Wesso and Dold do all the illustrations, with an occasional Shneeman thrown in. Lately I have seen a cover by Dold. It was superb. The cover was for the first issue of a magazine that Elliott Dold edited, wrote for, and illustrated. I think Dold is the only artist to ever have a story printed.

Well, I guess I'll sign off with a request for revival of *Strange Tales*, since there is not going to be a quarterly.—John V. Baltadonis, 1700 Frankford Avenue, Philadelphia, Pennsylvania.

Paging Smith, Taine, Campbell.

Dear Mr. Tremaine:

Astounding Stories continues to lead the field. What an issue the August one was! I just finished it. There was one defect, though—the cover again. Brown crowded too many things onto it. Also, I think a cover illustrating a serial should depict a scene from the part of the story that's in the issue. Try Wesso on a cover. Try him just once. That's all we ask.

Speaking of Wesso, I'm delighted with the increased use of his interior work. The most casual glimpse could not fail to note the superiority of his drawings to the others. He's at his best for *The Return of the Murians*. Keep him busy and keep Brown off the interiors.

It's too bad that Weinbaum's last story for Astounding had to be below his standard. *Proteus Island* is good, but far from his best.

All praise to Jack Williamson! I never thought he could do it but he made *The Conquerors* every bit as good as *The Legion of Space*. It's a grand story and I hated to see it end. I'll never forget those characters and I hope to meet them again sometime.

The Incredible Invasion starts out well. It seems to be another of those "mystery-invaders-threaten-world" type of plots, but it's handled in an interesting way and has some new angles. *The Return of the Murians* is another fine tale by a writer I regard as your greatest. I see Fearn's name on the cover but no story by him. Watch yourself, Mr. Editor.

A Leak in the Fountain of Youth is a highly

amusing tale. Such a yarn is quite a relief from the serious business of saving the world. *En Route to Pluto* is told in an appealing way. I enjoyed it very much.

In *The Scarab Gallun* has hit upon an excellent and novel idea. After all, why need a robot be man-shaped? This story is a gem of the first order.

Black Light is an engaging tale and well-written. So, with Campbell's fine article and Brass Tacks, a truly remarkable issue is rounded out.

I've been thinking about that brickbat I presented Brown with in my very first paragraph. That doesn't apply when he does work like the July cover illustrating *Pacific*. That's the sort of cover I like.

Letters and more letters asking for Anthony Gilmore and S. P. Wright. Why not at least tell us why they don't write for you? Glad to see Neil Jones. Too bad a rival beat you to A. Merritt. How about some more of Hamilton's work?

The mortality rate among science-fiction writers seems high. Maybe writing the stuff is too much of a strain. Well, reading it remains my favorite indoor sport, so please keep up the good work of publishing the best. And try to hurry Smith and Taine and Campbell up a little bit.—Donald V. Allgeier, 707 East Madison Street, Springfield, Missouri.

A Definition of Infinity.

Dear Mr. Tremaine:

Astounding Stories, sole supporter of the light of science-fiction in these days of barbarism and ignorance, I salute you. (It looks as though your two principal competitors have, temporarily at least, withdrawn their support, if you see what I mean.) Brown's cover was very good. I think his new style is superior to his old, but it shows signs of needing more development. Several spots in the picture are rather poor, but, on the whole, the effect is quite striking.

Finality Unlimited was well written and entertaining, but it gave me an impression of futility. In spite of this, it was the best story in the issue, except perhaps for Fearn's effort. Even that was below the Fearn par.

As for Mr. Andrew's query about numbers beyond infinity, there obviously can be none because, by definition, infinity is larger than any number that you can name, and if there were a number larger than infinity, infinity would be smaller than that number, and this, by definition is impossible. Zero cannot be looked on as a limit to a mathematical abstraction, which numbers are, when they are not applied to anything. For instance, zero can be looked on as the limit of the cows in a herd, or the number of eggs in a basket, but not to abstract numbers. It is obvious, then, that there is a negative infinity which corresponds to positive infinity, except that it is less than zero, which then becomes just the midpoint between the two infinities.

And now, I wish to close this with a plea for quarterlies, semimonthlies, annuals, or anything else along that line that you might throw our way, and also for the large size which would certainly add distinction to the one and only Astounding Stories.—Frank Driggers, 743 Spruce Street, Berkeley, California.

Keep Van Lorne on Novelettes?

Dear Editor:

There is not much that I can say complementarily about the current issue. I always enjoy reading Astounding more than other science-fiction magazines, and this month's was not any exception.

But, there was not a single story that I would care to reread. Then, too, they showed

a similarity of thought—a tendency toward the one-track.

Finality Unlimited: I always enjoy Wandrei's tales. His style never falters. He has an acceptable basic idea, but every story requires a plot. If his story in next month's Astounding Stories is another drawn-out incident, I shall personally give him the spanking he talked about in *Finality Unlimited*.

Little Hercules: Don't tell me this is to be another series. It has all the earmarks. Can't you have a few completed stories in your magazine?

Deserted Universe: Typical of Fearn. I enjoyed it, even if I didn't have anything when I had finished.

The House That Walked: Somehow it didn't click with me, but it may have been all right.

The stories by Van Lorne and Gallun were good. Gallun always improves an issue. Keep Van Lorne on novelettes, however. He is better on light stories of adventure and science. The ending to his present story is disappointing.

The Song From the Dark Star: We all make mistakes, even editors, it seems. Although unique in that it ends as a story should end, it is the most poorly written one I have seen between your covers in a long time.

I hope you see the point I have been trying to make. We read for entertainment. Stories that end with the hero, or the Earth, or the Universe dying may be thought-provoking, and of excellent merit, but become boring in the long run.

Yours for a more sanely balanced magazine.—Lawrence Miller, 2740 Vincent Avenue, Norfolk, Virginia.

Eye Openers.

Dear Editor:

You are to be congratulated on the inclusion of two eye openers in the excellent September issue. The first is what promises to be one of the finest serials ever to appear between your covers, *The Incredible Invasion*, by Murray Leinster. I have long thought Leinster to be one of your most competent writers. Too many science-fiction authors begin by stuffing themselves with scientific theory and then start to try and write. But Leinster is a writer first, a science-fictioneer, second. As a result he never loses sight of that fundamental to successful writing—the story. And I've never read a Leinster yarn that wasn't interesting.

The second high spot in this issue, for me, was *The House That Walked* by a newcomer, Dave Barnes. I'm afraid there'll be some argument about this one because it's decidedly out of place in Astounding Stories. Yet, where would they print it? It's a remarkable combination of detective, mystery, pseudo-science, and supernatural—an expertly done, strange and compelling story. I shall remember it for a long time.

The rest of the issue is typically good entertainment, some good, some bad. Gallun comes back with a novel concept well-told. He's usually interesting. Van Lorne is the obverse; he also has a new idea, but his clumsy and jerky style spoils the story to some extent. The novelettes are both all that could be desired, while Wandrei, of course, comes through nobly.

This is my first letter to you and I would like to see myself in Brass Tacks if it can be arranged with the powers that be. In closing, let me cast my vote for editorial comments after the letters, providing it doesn't offer difficulty in the make-up.—William Biersach, 1618 Whitley, Hollywood, California.

One for Neil R. Jones.

Dear Editor:

Although I have put this occasion off as long as possible, still I have finally determined to write. I consider the August issue as the best

of the year so far. The cover was great and so were the stories. *A Leak in the Fountain of Youth* was very good. I rate it better than any other short for years.

Now I will go on to the September issue, which was my real purpose in writing. The cover was terrible. A hodgepodge of machinery. And the woman! Purple hair, shoes drawn wrong—altogether not my idea of a beautiful woman. The inside drawings for *Finality Unlimited* were good except for the extreme boyishness and youth of the scientist. The rest of the drawings were good. Elliott Dold's in particular.

Now for the stories: *Finality Unlimited* was fair, although I think it was somewhat like *Mathematica*. *The House That Walked* was fair. *A Beast of the Void*, the same. But *Little Hercules*! Boy! That is a story which I will remember for some time, in spite of its old plot! The rest of the stories are from fair to middling.

Now how about large size? Please tell me, yes or no, whether you will revive the quarterly? I am fourteen years old and wish to correspond with any one my age.—Louis Kuslan, 170 Washington Avenue, West Haven, Connecticut.

"Finality Unlimited."

Dear Editor:

Have just finished the first reading of the September issue and would like to make a few comments while the shock is still fresh in my mind.

I am still trying to get my breath after reading *Finality Unlimited*. Maybe I read it in too much of a hurry. Anyway, it certainly was a swell story, despite some rather chaotic spots during the apparent synchronizing of the six controls.

The smooth edges are looking better and better with each issue I add to the shelf. Thanks again for this improvement. Speaking of improvements, the only one in sight now is the publication of a quarterly with several long stories. I am all for the memorial volume of Weinbaum stories. My order is on the way. I would also like to see "The New Adam" published.

All the stories were up to, or above, par, with the possible exception of *Little Hercules*, which didn't seem to have any ending. How about a sequel to finish up the story? Was *A Beast of the Void* science-fiction or a weird tale? If science-fiction, where does the science come in? Glad to see Dold back. This month's cover is also excellent. Best wishes for continued growth.—Alton W. Mackay, 415 Wheeling Street, Morgantown, West Virginia.

I'll Try to Get That Heading.

Dear Editor:

My thanks and compliments to Donald Wandrei for his *Finality Unlimited*. Although some of his conceptions and effects were outside the bounds of plausibility or even possibility, it provided a great deal of food for thought. Come again, Mr. Wandrei.

The serial novel, *The Incredible Invasion*, has maintained its high standard in this September issue, and the illusion of reality is in this story to a high degree. For this reason alone it would be good, for it is a quality that seems to be difficult to write into a science-fiction story—at least it is a rare article.

The illustrations by Wesso and Dold in this issue are all very good, and Schneeman's work deserves mention. Inasmuch as some artists do not sign their work, will you not print their names with each story? The cover illustrations this year have maintained the highest consistent standard since the first science-fiction magazine was published. Here is something which I requested before. Please have

Wesso or Dold draw a new heading for Brass Tacks.

I notice a number of requests for a quarterly. I have explained before why I do not think it would be a success, but I do believe the market is ready now for you to go semimonthly. If you have the stories on hand, go ahead. If you're ready, we are.

The suggestion by R. W. Parr on short-short stories submitted by readers is a good one. No prize would be necessary. It would be payment enough to know one's efforts were good enough to pass your editorial eye.

I like your policy of keeping editorial comment out of Brass Tacks, but I believe that when a published letter asks you directly two or three questions which are of general interest, they should be answered in brackets.

Neil R. Jones, I know you can do better than *Little Hercules*—an absolutely pointless rambling, interesting while it lasted. All the other stories were good except the one by that outcast, Richard Tooker. Keep him out. The illustration for this last was also the only bad one.

How about it, "Doc"? How are you coming on the new Skylark story? Any more new ideas, or have you gone your limit? And to John W. Campbell, Jr.: where have you been keeping yourself? In between science articles, please try to give us some stories.—L. M. Jensen, Box 35, Cowley, Wyoming.

Mr. Wandrei Please Read This!

Dear Editor:

Finality Unlimited! Of all the incomprehensible, meaningless, stories that I have ever read in the pages of a science-fiction magazine, this one takes the cake. I could see absolutely no plot, and after reading it twice, I was left with nothing but a lot of jumbled thoughts.

It would seem that Mr. Wandrei not only let the life control run wild, but also his mind and pen. The result was sickening. I wonder if the author himself could explain what he wrote. Your magazine, however, with the exception of an occasional lemon like *Finality Unlimited*, is improving. Keep up the good work, but please, no more stories printed only because of the author's name.—George Williams, Hotel Windmere, Chicago, Illinois.

General Summation.

Editor, Astounding Stories:

To thoroughly comment upon a magazine, I suppose one should start with the cover and work inward, so here goes. Mr. Brown's cover this month is, as usual, nothing extraordinary. Why is the girl covered with radiations? Wandrei said that her suit was translucent, not radiant. Surely, Mr. Brown knows the difference.

Finality Unlimited was one of the best stories I have ever read. I was forced to turn back and make sure the author wasn't Fearn, every few pages.

Although slightly hackneyed, *A Beast of the Void* was a good story. I have never read a story by Mr. Gallun that sank below the average. He is a good, consistent, original writer.

Little Hercules was a good story, but I wonder if it is entirely original. Have you ever read *Intrigue on the Upper Level*, by T. T. Hoyne?

Follow the Rocket Trail and *The Song From the Dark Star* were both good ideas and well written, but for some reason they just didn't seem to click. Mr. Campbell's articles are getting better every month. They are a valuable boost to Astounding Stories which heretofore has been totally devoid of departments, poems and regular articles.

In *Deserted Universe* Dr. Calthorpe bases his entire idea on the fact that the intelligence of

people should not be confined in the puny bodies of men during our short life and then die with our physical selves. Dr. Calthorpe points out the narrow range of temperature that the human body can stand, but isn't a chain only as strong as its weakest link? If we are but cells in the brain of some superentity, wouldn't that superentity be subject to the same limitations? If the cells of our body were to die, wouldn't we be dead? Think it over, Mr. Fearn.

In view of the fact that I entered by the cover, I will leave by the same gate with one parting shot. Why don't you let Dold do a cover? I have been reading science-fiction magazines for five years and haven't seen a cover by Dold yet.—Carlisle Hays, Route 4, Box 370, Louisville, Kentucky.

From Montreal.

Dear Editor:

I am not familiar with English writing, but it is after many delays with myself that I write to Brass Tacks.

I wish to tell you that I praise your magazine above all. Yours is the best of the trinity for the present, both in appearance and content.

I am not going to discuss the merits of your artists. I think they all do their best to make Astounding what it is—the very best.

A few words about Lovecraft: I don't like this author because of the madness of his stories, but as many readers like that stuff, I wish you wouldn't print too much of it unless he changes the subject.

Give us more space travel like in the good old time of *Skylark of Space*. I think you should reprint those good stories which have made a hit with the readers of the past. A quarterly is a good idea, but never put Astounding as a bimonthly magazine. Keep it at its standard of quality.—Charles A. Piché, 1326 Guilford, Montreal, Canada.

There Was a Good Story?

Dear Editor:

I have been reading Astounding Stories since its inception, but never have I seen such an issue as the September one! I really don't see how you had to print such trash when, as the best science-fiction magazine, you can procure whatever you want.

Finality Unlimited was a mess. I have never seen a worse hodgepodge of silly facts before. *Little Hercules* was better, but I don't see why it was printed here, for it certainly wasn't scientific. *Deserted Universe* sounded like the avenging wrath of Doom. It is a recognized fact that the brain remains active a short time after death, and just because somebody finds it out is no reason why life should disappear from the Earth.

Follow the Rocket Trail was abysmally absurd. Did the author ever consider the fact that we are constantly being bombarded by meteors and that the planets are tremendously heavy. *The Song From the Dark Star* was a stupid attempt at fantasy, I suppose, but it needs no further comment. *The House That Walked* was a stupid mystery story and Part II of *The Incredible Invasion* was just a thriller. I couldn't find any science in it.

The only good story was *A Beast of the Void*. Mr. Gallun did not choose a common subject, but he wrote his story with the assurance of a good writer. The description of darkness is a good description of what a stranger would feel on Earth. I enjoyed *The Veiled Planet*, but I think it would be better if Mr. Campbell would write us some more of his wonderful stories, as these scientific features are below his talents. Hope you will excuse these brickbats; I usually enjoy your magazine a lot.—Morgan Boyd, Cascade Street, Pittsfield, Massachusetts.

Mr. Van Lorne Please Read This.

Dear Editor:

Just a few words to point out the fact that the story *Follow the Rocket Trail* in the September issue was based on a fallacy of reasoning. The author seems to believe that if the mass of the Earth were increased, it would stray from its orbit and go gallivanting around all over space. I wonder where he gets the idea.

As every one knows, the Earth is kept from falling into the Sun by its centrifugal force, as it never moves around in its orbit at more than eighteen miles per second. It is kept from going outward by the gravity of the Sun; therefore, its fixed orbit is the circle, or ellipse, where these forces neutralize each other, with slight variations caused by the other planets. The formula for centrifugal force is: $C. F. = \frac{mv^2}{r}$

(in dynes) = $\frac{mv^2}{r}$. "M" is mass; "v" is velocity;

and "r" is the radius of the circle. Any one with the slightest knowledge of algebra can see that any increase in "m" would result in a proportionate increase in centrifugal force. If the mass of the Earth were doubled, the formula

would become: $C. F. = \frac{2mv^2}{r}$ and the centrifugal

force would also be doubled, leaving the two forces still equal and balancing the Earth in the same orbit. Something would have to be done to "v" and "r" before the orbit could be changed as much as it is changed in *Follow the Rocket Trail*.

Of course, slight changes might result from the difference in attraction between the planets, but in this case the same amount is added to the mass of the Earth as is subtracted from the others, so the total attraction between them would still be the same. Wesso's drawings in this issue were marvelous.—Oliver E. Saari, 1427 Logan Avenue North, Minneapolis, Minnesota.

More About a Quarterly.

Dear Mr. Tremaine:

Again I must voice my appreciation for the fine science-fiction magazine you have been editing for us readers. Up until a few issues ago, I was undecided as to whether Astounding is the leading magazine of science-fiction. After reading the June, July, August and September issues I was convinced that Astounding is the best science-fiction periodical.

You have given us back all the old-time favorites, plus Wesso and trimmed edges. What next? Have you noticed all the readers asking for a quarterly? I have, and I agree. We must have an Astounding Stories quarterly. Gee! What a thrill it would be to buy the first issue!

Donald Wandrei came back to science-fiction with a bang. *Finality Unlimited* actually makes one think. Although this story was very interesting it did not come up to the standard attained by his *Colossus* and its sequel, *Colossus Eternal*. Wandrei is a master at writing thought-variants. His forthcoming yarn, *Infinity Zero* contains an interest-arousing title.

Little Hercules marked Neil R. Jones' initial appearance in Astounding Stories. One reason why this story appealed to me is because it is, in a way, a sequel to *Escape From Phobos*, which story was contained in the first science-fiction magazine I ever read. After reading *Little Hercules* I came to the following conclusion: there must be a sequel! If Neil R. Jones doesn't oblige, I'll do something drastic. I may even stop reading science-fiction! Think of it—me not reading science-fiction. Why, that could even change the scheme of things!

John Russell Fearn's *Deserted Universe* made interesting reading, even though it was slightly implausible. Some readers don't like Fearn because he doesn't stick to present-day science. I like his work because it gives me food for thought.

The short stories were all fine. When I read the title of Van Lorne's creation, I thought he had pulled a "Clifton B. Kruse." I was greatly relieved to find that he hadn't.

Brown's cover this month was pretty poor. There is too much on it. Furthermore, the features of the characters are blurred. Merl Hudson looks as if she is "going into her dance." Give us covers which are symbolical of science-fiction, such as the April and July cover paintings.

One reader says that there are just as many who like Clifton B. Kruse's wild and woolly yarns as those who don't. I disagree. In the current issue there are seven letters of objection and only one of praise. I guess that decides it. —Robert A. Madle, 333 East Belgrade Street, Philadelphia, Pennsylvania.

Mr. Campbell Please Read This.

Dear Mr. Tremaine:

Received my Astounding on Saturday and have not finished it yet, but have two comments to make:

The Incredible Invasion is A 1—although I got fooled last month by not noticing it was a serial and starting it before I had all the installments.

So much for the roses, but— Please take up that copy of Astounding on your desk and turn to *The Veiled Planet*, Page 102, first paragraph. "—pressure applied to either bromine or iodine immediately restores it to liquid—" Maybe my chemistry teacher was fooling me all the time, huh?

I like John W. Campbell, Jr.—he's a swell author, but as a chemist he's a good astronomer.

This would be inexcusable coming in a story, but in an article—wow! Words are feeble! It can't be expressed.—Randy Vickers, 626 Constance Avenue, Victoria, B. C.

Concise Opinion.

Dear Mr. Tremaine:

I am giving a concise opinion of the September issue.

Cover: inferior to previous covers. Brown should strive to leave humans off the cover.

Finality Unlimited: a masterpiece. I would like to see a story of this type in every issue.

The House That Walked: The Orb of Probability, appearing some time ago, had the same basic idea.

A Beast of the Void: an original idea and well-written.

Little Hercules: the same.

Follow the Rocket Trail: a prediction and a warning to the future.

The Song From the Dark Star: original and different story.

Editorial answers to letters are better than personal answers, as all readers have an answer to important questions.

As it is improving in leaps and bounds, Astounding could do well with a few departments such as its competitors have.—Rudolph Castown, 42 Amity Place, Mar. Harbor, Staten Island, New York.

Mr. Jones Please Read This!

Dear Mr. Tremaine:

In all of my letters so far, where the stories were concerned, I have just told you which story I liked and which story I disliked, but now I am going to tell you why I disliked one story.

Little Hercules is the one I am writing about. Of all the stories to pick from, you had to pick this senseless one. The grammar in the story was all right, but the story itself was not. Mr. Jones starts it swell, begins to build up a climax,

but just as it gets interesting, it ends without a climax. The story had no story! Please do not give us any more stories as incomplete as this one.

The serial is coming along very well. The rest of the stories were good also.

Wesso and Dold did a very good job of the September issue with Schneeman very close behind; but the rest were plain, every-day lousy! When are you going to have Wesso paint the cover?—James Taurasi, William C. Taurasi, 31 West Union Square, Room 1515, New York, New York.

Editorial Comments.

Editor, Astounding Stories:

With the last few issues, Astounding Stories has gained a class and distinction which places it way above the level of the average pulp magazines. First, trimmed edges! Then, the science feature. And now, large-size one- and two-page illustrations by Wesso.

Wesso is without a doubt the best interior illustrator in the entire science-fiction field. And the two-page pictures certainly add a lot to the magazine's appearance! Whatever you do, keep Wesso! If any Astounding Stories readers would like to join a new organization for science-fiction fans, The Fantasy Magazine League, please communicate with me. Membership is free, no dues. I'd appreciate it if you would publish this short missive.

One last plea: editorial comments after letters in Brass Tacks!—Hayward S. Kirby, Great Barrington, Massachusetts.

Question for Mr. Leinster.

My dear Mr. Tremaine:

Like a bad penny I've turned up again in my second attempt to enter the sacred portals of Brass Tacks.

To begin with I can offer no complaint as to the quality of the illustrations, binding, size of print, smooth edges, and paper. The content, or reading matter, is surprisingly good, and I find but few outstanding mistakes—no doubt due to my utter lack of scientific knowledge.

By the way, Mr. Tremaine, the second part of *The Incredible Invasion* has come and gone and I still can't place the August cover.

I beg to differ from Mr. Wandrei. Both matter and energy cannot be "basic factors of the universe," as matter is simply another form of energy.

In *The Beast of the Void* at the time of the illustration, Darkness is supposed to be nine feet in length. The artist—Dold—drew the monster a full twenty feet in diameter.

In *Little Hercules* Grima's body is supposed to be halved by reducing the orbits of the electrons. Now there is a balanced attraction between the nucleus of an atom and its outer electrons. If this balance were disturbed, the two innermost electrons would probably be drawn into the confines of the atom's nucleus. This action would change the nature of Grima's atoms and his body would be a turmoil of minute, conflicting forces. Mr. Jones should have produced his dwarfs by glandular action.

I do not believe that hybrids such as Mr. Jones describes would be possible. An animal, in order to survive, has a complete, continuous circulatory system. Mammals are warm-blooded. Insects are not. I wonder what happened at the junctions of the warm- and cold-blooded streams.

In *The Incredible Invasion*, Mr. Leinster claims the stiffened bodies atoms faced a direction intermediate between normal and those of the Invaders. Now, since the bodies formed matter in our world, would they not also be present in the Invaders? Would the bodies not eventually become a nuisance to the Invaders, who would remove them? And wouldn't the mice Waldron obtained be visible to the Tu-

vaders and therefore be a direct clue to his immediate location? What say, Mr. Leinster?

Stories rating first, second, and third in this issue were *Finality Unlimited*, *Deserted Universe*, and *The Incredible Invasion*. I am actually pleased to observe a conspicuous absence of space wasters, i. e.: interplanetary stories of strife from which science has flown.—I, Edward Chernoff, 45 Hegeman Avenue, Brooklyn, New York.

Remember "Dead Star Station"?

Dear Editor:

Just finished *The Cometeers* and I think it a whale of a story. Good as it was, however, it didn't come up to the standard set by its predecessor, *The Legion of Space*. Jack should stick to his own department, in which he excels, instead of wandering off and dabbling in super-science. His specialty is—or rather two of them are human interest and smash-bang action. He can portray characters most vividly. I shall never forget Giles Habibula, or old Gideon Clev of *Dead Star Station*.

Probably everybody will disagree with me, but I think that *A Leak in the Fountain of Youth* was the best story in the issue, with *The Scarab* second. Why? Just because they were different. *Proteus Island* reminds me somehow of *The Island of Dr. Moreau*. *The Return of the Murians* is old stuff. Breuer's *Fitzgerald Contraction* was much better.

Black Light wasn't so bad as far as the science went, but it wasn't much of a story. What spoiled it for me was the terrible illustration that went with it. Wesso, Brown, Marchioni, Schneeman, Saaty and Dold are plenty of artists for one magazine. The others only clutter it up. The last two, even, could be dispensed with, without any sense of loss. However, I suppose a universal howl would go up for Dold, though I don't know why.

I'm certainly glad you started the science feature, as it is one of the best things that have happened since you went up to one hundred and sixty pages. Wesso is hitting his old stride again and surpassing it, I believe. I and many others would like to see at least one cover by him.

I hear rumors that a quarterly is forthcoming. I certainly hope they're true. Are they? Glad to hear Wandrei is coming back. How about digging up Howard W. Graham again and getting a sequel to *The Other*. Also Breuer and Keller would be welcome.

Best letter in Brass Tacks was by O. M. Davidson. Dollens: good idea. Hoskins: bravo. Pritchard: absolutely right about illustrations.

I know *The Incredible Invasion* will be good, because look who's written it! I hope it's a sequel to *Sidewise in Time*. If it isn't, how about writing one, Mr. Leinster?—Arthur L. Widner, Jr., 119 Co., CCC, Waterbury, Vermont.

He Wants a Quarterly!

Dear Editor:

I have just finished reading the August issue of *Astounding Stories* and all I can say about it is that it's one of the best issues this year. Nat Schachner scored another victory with his four-star story, *Return of the Murians*. I've never been disappointed in him yet. Every story he writes is as good, if not better, than the one before it.

A Leak in the Fountain of Youth, by A. R. Long, is one of the best short stories I've had the pleasure of reading in our magazine. *The Scarab* was very entertaining also. But the other two shorts were not worth the paper they were printed on.

En Route to Pluto was the worst of the issue. I don't think it was as warm on Pluto as the author states. Although Pluto is more than ten times farther away from the Sun than Mars is, it was only slightly colder there. Mr. West's scientific knowledge puzzles me. It's a puzzle

to me why it could be so warm there when it is so far away from its only source of heat. Why, even on our own Earth, the temperature rises higher than 75 below zero, but Pluto is twenty times farther away from the Sun than we are and its temperature—in the story—was 172 below.

I don't know why you ever published such a story as this. It leaves many questions unanswered at the end. Why didn't the heat ray have any effect upon the frost people, and why did the cold ray disagree with them? Where did they come from and what were the reasons for their drastic actions upon the two adventurers? All considered, it was a mighty poor narration, and I hope we don't get any more like it.

Proteus Island was all right—about as good as any of Weinbaum's other stories.

I'm sincerely glad to see Wesso doing most of the art work. Now you have a real artist illustrating the stories.

Some of your readers have very poor literary tastes. I'm talking about Lovecraft's two magnificent stories. Only six letters in Brass Tacks stated that they really enjoyed the stories, while eight letters condemned the two stories. I agree wholeheartedly with W. B. Hoskins, who says Lovecraft is one of the few real authors you have.

This month's cover wasn't so good. Why don't you have Wesso or Dold draw a cover and give Brown a little competition?

I'll keep clamoring for a quarterly until we get one. There were four letters in Brass Tacks asking for a quarterly and many readers don't ask because they think it's a hopeless task to induce a stubborn editor to publish a quarterly. Why don't you have a vote on it?—Alex Konchis, 5606 Harold Street, Detroit, Michigan.

Good News from Leeds.

Dear Mr. Tremaine:

Some years ago I made a vow not to write to you while you were under the *non de plume* of "The Editor." However, at long last, whether by accident or done on purpose, it has leaked out. I hope you will drop the camouflage for good.

On the subject of Mr. Tremaine: He has done what I think must be a record for any editor—he has given the readers what he promised them and more.

Now for the stories themselves: Mr. Tremaine wisely got hold of the most promising of the young authors and allowed them to bloom out under his wing. This policy has been more than successful. Compare Nat Schachner's work of a few years back to the masterpieces he is turning out to-day. Schachner is only one. Others are Fearn, Gallun and Jack Williamson—none of whom gave their best until they came under his banner.

I will now analyze the current number: *Child of the Stars* by Gallun is the best story yet in the series, and that is saying something. *The Chrysalis* is a grand yarn with an unexpected twist at the end. How did *The White Doom* sneak in?

The new serial is grand. Bider has been one of my favorites ever since he began writing. For once we have a scientist who does not use a powerful weapon against society. I think the world could do with a Renouf to-day.

On Weinbaum: I have not once heard a single fan run one of his works down, and I personally, think he was one of the best science-fiction writers ever.

On artists: Glad Dold's gone. I never liked his work. Marchioni and Wesso are the two finest science-fiction artists to-day. If you don't take Brown out of the interior, I can see trouble ahead. His covers are the best I've ever seen, but please don't let him desecrate the interior. I should humbly suggest that you get Manning to try to fill Weinbaum's unfillable place.

What's more, your sales have gone up twenty per cent here since you trimmed the edges.—L. Chester, 2 Amberly Terrace, Leeds, England.

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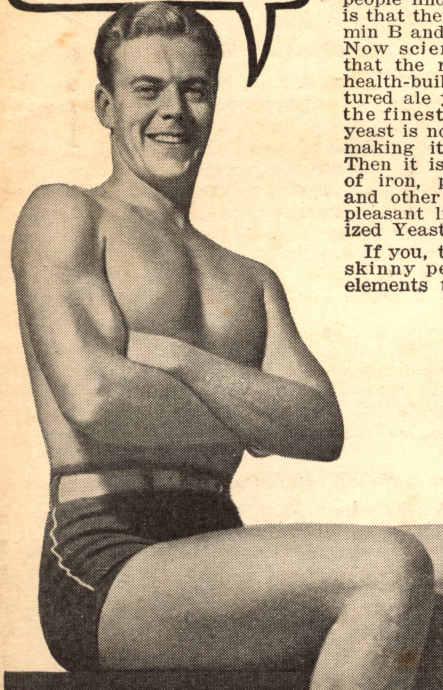
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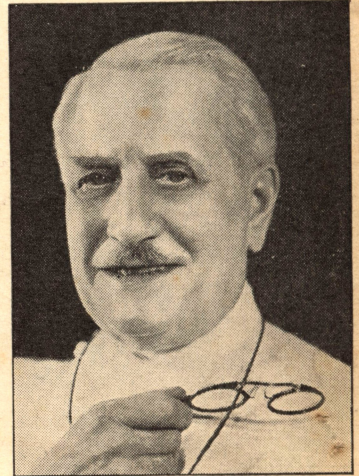
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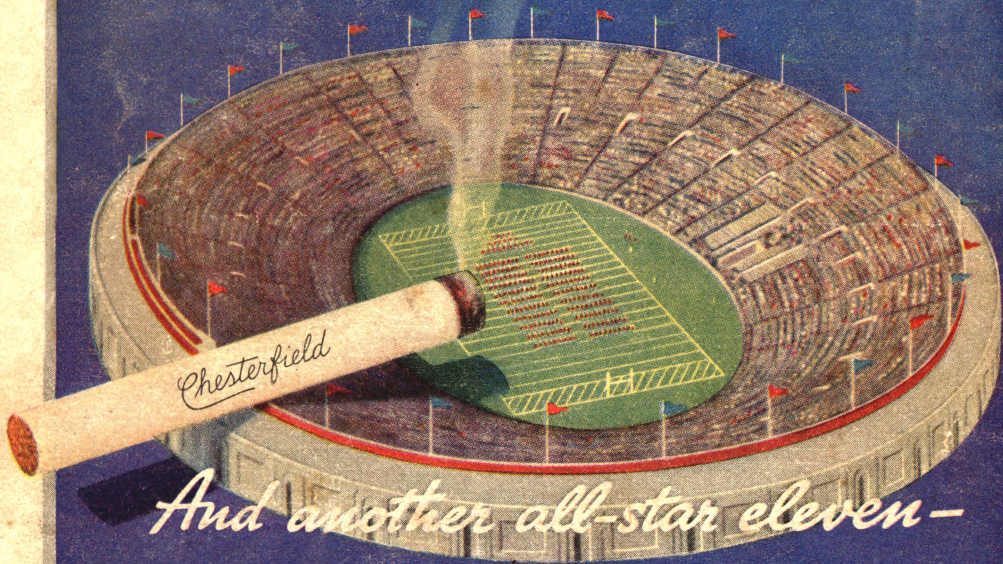
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