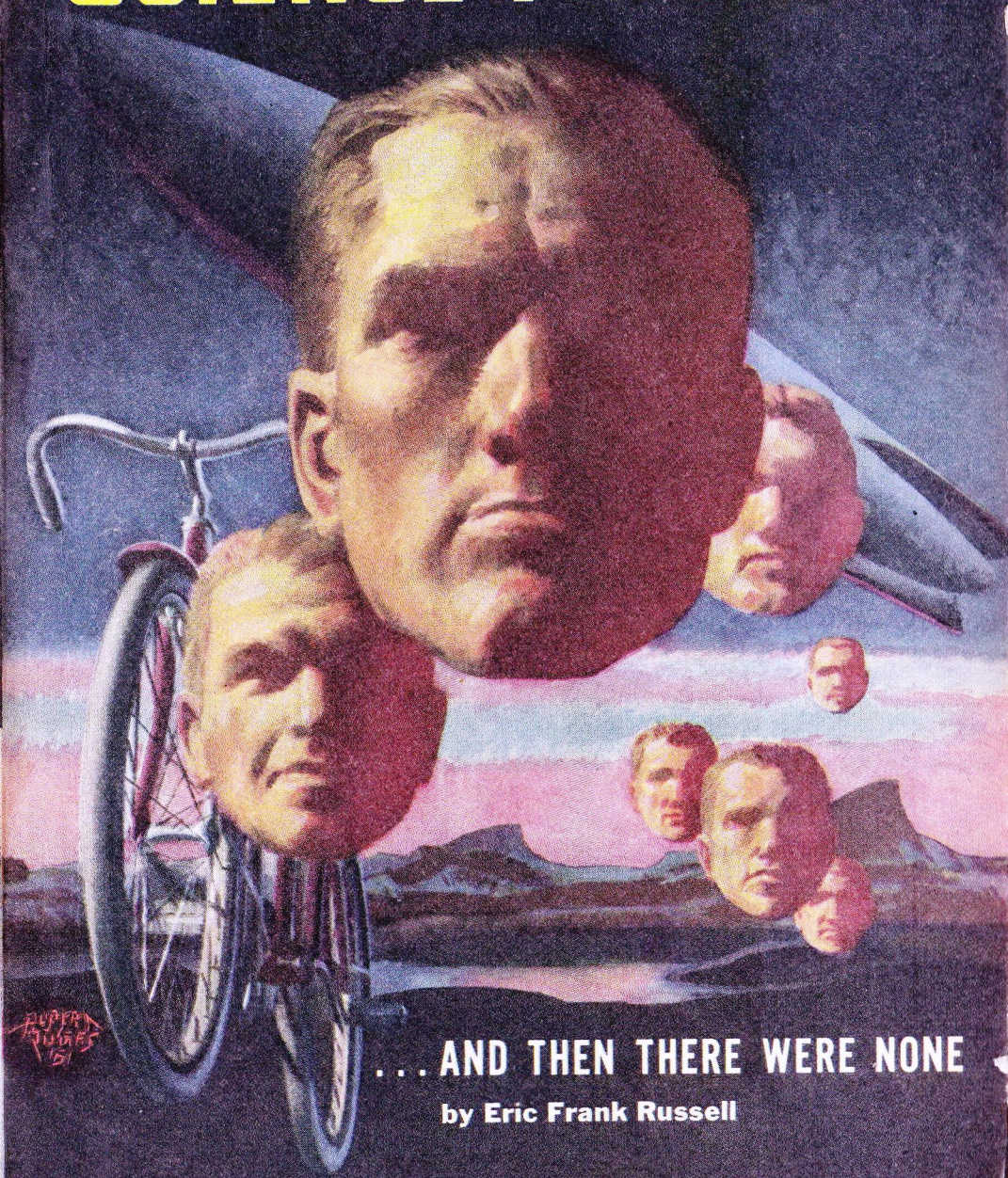
JUNE 1951 • 25 CENTS

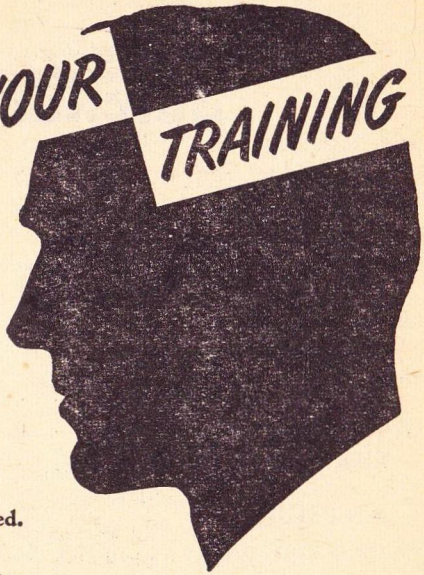
Astounding SCIENCE FICTION



. . . AND THEN THERE WERE NONE

by Eric Frank Russell

FILL THE GAPS IN YOUR TRAINING



No one goes into a job perfectly prepared. Sooner or later the "weak spots" are bound to show up. And when they do, the successful man is quick to recognize them, *quick to fill the gaps.* International Correspondence Schools can help you get whatever training *you* may need. You have some 400 famous, spare-time I.C.S. Courses to choose from. Or, if you wish, brief "refresher" courses, advanced lessons, or special instruction combining one or more specific business or technical subjects can be *tailored* to fit your needs. The coupon below brings full information without obligation. Mark and mail it today!

INTERNATIONAL CORRESPONDENCE SCHOOLS

APPROVED under the G.I. BILL

BOX 1716, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Business and Academic Courses
- ☐ Accounting
- ☐ Advertising
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Bus. Correspondence
- ☐ Bus. Law
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship
- ☐ French
- ☐ Good English
- ☐ High School
- ☐ Higher Mathematics
- ☐ Illustration
- ☐ Industrial Supervision
- ☐ Motor Traffic
- ☐ Postal Civil Service
- ☐ Retailing
- ☐ Retail Bus. Management
- ☐ Salesmanship
- ☐ Secretarial
- ☐ Sign Lettering
- ☐ Stenography
- ☐ Spanish
- ☐ Traffic Management
- ☐ Typing

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating
- ☐ Plumbing
- ☐ Refrigeration
- ☐ Steam Fitting

Chemical Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining
- ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Prac. FM and Television
- ☐ Prac. Telephony
- ☐ Radio Operating
- ☐ Radio, General
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician
- ☐ Power House Electric
- ☐ Ship Electrician

Internal Combustion Engines Courses
- ☐ Auto Technician
- ☐ Aviation
- ☐ Diesel-Electric
- ☐ Diesel Engines
- ☐ Gas Engines

Mechanical Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging
- ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Machine Shop Inspection
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting
- ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake
- ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Locomotive Machinist
- ☐ Railroad Section Foreman
- ☐ Steam and Diesel Loco. Eng.

Stationary Engineering Courses
- ☐ Boilermaking
- ☐ Combus. Engrg.
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Power Plant Engr.
- ☐ Steam Engineer

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Loom Fixing
- ☐ Rayon Weaving
- ☐ Textile Designing
- ☐ Woolen Manufacturing

Name_____ Age_____ Home Address_____

City_____ State_____ Working Hours_____ A.M. to_____ P.M.

Present Position_____ Employed by_____

Length of Service in World War II_____

Enrollment under G.I. Bill approved for World War II Veterans. Special tuition rates to members of the Armed Forces.

Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Astounding
SCIENCE FICTION®

JUNE, 1951 VOL. XLVII, NO. 4

NOVELETTES

SHORT STORIES

ARTICLE

READERS' DEPARTMENTS

Editor JOHN W. CAMPBELL, JR.
Assistant Editor KAY TARRANT
Adv. Mgr. WALTER J. MC BRIDE

Illustrations by Cartier, Orban, Rogers, Ward and Welker

COVER BY ROGERS

Astounding SCIENCE FICTION published monthly by Street & Smith Publications, Incorporated at 575 Madison Avenue, New York 22, New York. Gerald H. Smith, President; Ralph R. Whittaker, Jr., Vice President; Arthur P. Lawler, Vice President and Secretary; Thomas H. Kaiser, Treasurer. Copyright, 1951, in U. S. A. and Great Britain by Street & Smith Publications, Inc. Entered as Second Class matter at the Post Office, New York, N. Y. Subscriptions $2.50 for one year and $4.50 for two years in United States and Possessions; $3.00 for one year and $5.50 for two years in Canada; $3.50 for one year and $6.50 for two years in Pan American Union, Philippine Islands and Spain. Elsewhere $4.00 for one year and $7.00 for two years. When possible, allow four weeks for change of address. Give old address and new address when notifying us. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage.
All subscriptions should be addressed to Subscription Dept., Street & Smith Publications, Incorporated, 304 East 45th Street, New York 17, New York.

$2.50 per Year in U. S. A. Printed in 16 the U.S.A. 25c per Copy

NEXT ISSUE ON SALE JUNE 20, 1951

IMPROBABLE ATMOSPHERE

The most active of all chemical elements seems to be fluorine, which combines with everything except the inert gases, and does so, usually, with violence, vigor and vim. Second on the list is oxygen; it also forms compounds with practically anything in the periodic table. Its compounds are extremely stable, usually, most of the simple inorganic oxides are high-melting solids. Obviously, oxygen can be expected to occur in the rocks of a planet, firmly bound in stable compounds. That the gas could occur free in nature is highly improbable — it's much too active.

Since hydrogen is the most plentiful of all elements in the universe, any planet of moderate size—say five thousand miles diameter and up—can be expected to have plenty of hydrogen. That will mean hydrogen oxide, water, will be present; the combination of oxygen gas and water is exceedingly corrosive. No, there is very little chance of finding free oxygen in an atmosphere . . .

Furthermore, if oxygen did occur free in the atmosphere of a planet at a moderate distance from its sun—a distance such as to keep the planet well above the freezing point of water—it would be exposed to another danger. Most stars radiate a great deal of ultraviolet—any star above the orange temperature range will produce floods of energy in that region of the spectrum. Oxygen has an extremely strong ultraviolet absorption characteristic, which means that the oxygen molecule becomes excited, and forms ozone in an oxygen-rich atmosphere. Ozone, in turn, has a heavy u-v absorption, and leads to production of ionized oxygen. All three—excited oxygen molecules, ozone, and oxygen ions carry surcharges of extra energy. They have available energy over and above their thermal energy. In the uppermost layers of an oxygen-con-

taining atmosphere, the gas is directly exposed to the star's u-v radiation; the level of excitation is relatively high — and there is almost nothing between those upper-level molecules and free space. The gas is so diffuse, so thin, that a molecule may travel several miles before colliding with another molecule.

The thermal velocity of oxygen at the planetary temperature under these conditions is far too low to permit the molecules to escape from the planet's gravity. But—if excited molecules collide, the result is different. Consider it as the collision of two cocked mousetraps; the energy available is not only that of the energy of motion, but there is also available, ready to burst forth, the energy of excitation. And that excitation energy, added to kinetic energy of thermal motion—that can readily exceed the velocity of escape. If an excited oxygen atom, with the unstable stress of energy surcharge, collides with another oxygen molecule, the combined energies can kick one of them violently enough to throw it out of the planet's gravity field.

It appears, therefore, that oxygen atmospheres are highly improbable —except for one factor.

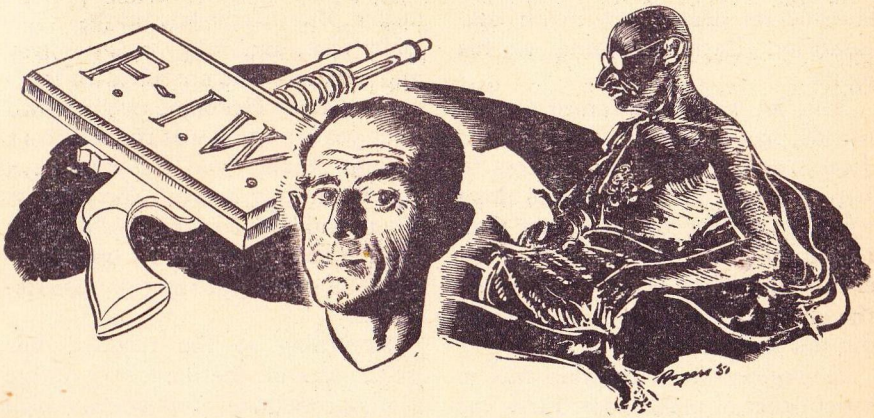
Life forms find the reactions of hydrogen, carbon and oxygen far and away the most suitable for the complex chemical processes of metabolism. Life has a strong preference for oxygen, as a result. Oxides are stable—but they'll yield when life forms use enzymes as fulcrums, and solar energy as the crowbar to pry them apart. Life takes the oxygen from carbon dioxide, and releases that into the atmosphere—and other life forms take the oxygen from the atmosphere and reform the carbon dioxide. There's a life cycle, which is a true cycle, and an inorganic cycle, which is not a closed cycle. The rocks of a planet can, and will, soak up oxygen to form higher oxides; this process life does not reverse. That represents a net loss of oxygen from the plant-animal cycle to the rocks. It's made up for by binding the carbon down as coal and graphite, and taking new supplies of carbon dioxide into the cycle.

The loss to space is, necessarily, made up the same way. On Earth, that is.

But it's highly improbable that a planet of a blue-white sun at a distance giving the same net planetary temperature could long retain an oxygen atmosphere. The flood of u-v would wash it away into space.

THE EDITOR.

★ ★ ★ ★ ★



. . . AND THEN THERE WERE NONE

BY ERIC FRANK RUSSELL

It was a very difficult world to get along on. Not that the people were exactly unfriendly; it wasn't even that they were willful—they were, if anything, won'tfull!

Illustrated by Rogers

The battleship was eight hundred feet in diameter and slightly more than one mile long. Mass like that takes up room and makes a dent. This one sprawled right across one field and halfway through the next. Its weight made a rut twenty feet deep which would be there for keeps.

On board were two thousand people divisible into three distinct types. The tall, lean, crinkly-eyed ones were the crew. The crop-haired, heavy-jowled ones were the troops. Finally, the expressionless, balding and myopic ones were the cargo of bureaucrats.

The first of these types viewed this world with the professional but aloof interest of people everlastingly giving a planet the swift once-over

before chasing along to the next. The troops regarded it with a mixture of tough contempt and boredom. The bureaucrats peered at it with cold authority. Each according to his lights.

This lot were accustomed to new worlds, had dealt with them by the dozens and reduced the process to mere routine. The task before them would have been nothing more than repetition of well-used, smoothly operating technique but for one thing: the entire bunch were in a jam and did not know it.

Emergence from the ship was in strict order of precedence. First, the Imperial Ambassador. Second, the battleship's captain. Third, the officer commanding the ground forces. Fourth, the senior civil servant.

Then, of course, the next grade lower, in the same order: His Excellency's private secretary, the ship's second officer, the deputy commander of troops, the penultimate pen pusher.

Down another grade, then another, until there was left only His Excellency's barber, boot wiper and valet, crew members with the lowly status of O.S.—Ordinary Spaceman—the military nonentities in the ranks, and a few temporary ink-pot fillers dreaming of the day when they would be made permanent and given a desk of their own. This last collection of unfortunates remained aboard to clean ship and refrain from smoking, by command.

Had this world been alien, hostile and well-armed, the order of exit would have been reversed, exemplifying the Biblical promise that the last shall be first and the first shall be last. But this planet, although officially new, unofficially was not new and certainly was not alien. In ledgers and dusty files some two hundred light-years away it was recorded as a cryptic number and classified as a ripe plum long overdue for picking. There had been considerable delay in the harvesting due to a superabundance of other still riper plums elsewhere.

According to the records, this planet was on the outermost fringe of a huge assortment of worlds which had been settled immediately following the Great Explosion. Every school child knew all about the Great Explosion, which was no more than the spectacular name given to the bursting outward of masses of humanity when the Blieder drive superseded atomic-powered rockets and practically handed them the cosmos on a platter.

At that time, between three and five hundred years ago, every family, group, cult or clique that imagined it could do better some place else had taken to the star trails. The restless, the ambitious, the malcontents, the eccentrics, the antisocial, the fidgety and the just plain curious, away they had roared by the dozens, the hundred, the thousands.

Some two hundred thousand had come to this particular world, the last of them arriving three centuries back. As usual, ninety per cent of

the mainstream had consisted of friends, relatives or acquaintances of the first-comers, people persuaded to follow the bold example of Uncle Eddie or Good Old Joe.

If they had since doubled themselves six or seven times over, there now ought to be several millions of them. That they had increased far beyond their original strength had been evident during the approach, for while no great cities were visible there were many medium to smallish towns and a large number of villages.

His Excellency looked with approval at the turf under his feet, plucked a blade of it, grunting as he stooped. He was so constructed that this effort approximated to an athletic feat and gave him a crick in the belly.

"Earth-type grass. Notice that, captain? Is it just a coincidence, or did they bring seed with them?"

"Coincidence, probably," thought Captain Grayder. "I've come across four grassy worlds so far. No reason why there shouldn't be others."

"No, I suppose not." His Excellency gazed into the distance, doing it with pride of ownership. "Looks like there's someone plowing over there. He's using a little engine between a pair of fat wheels. They can't be so backward. Hm-m-m!" He rubbed a couple of chins. "Bring him here. We'll have a talk, find out where it's best to get started."

"Very well." Captain Grayder turned to Colonel Shelton, boss of the troops. "His Excellency wishes to speak to that farmer." He pointed to the faraway figure.

"The farmer," said Shelton to Major Hame. "His Excellency wants him at once."

"Bring that farmer here," Hame ordered Lieutenant Deacon. "Quickly!"

"Go get that farmer," Deacon told Sergeant major Bidworthy. "And hurry—His Excellency is waiting!"

The sergeant major, a big, purple-faced man, sought around for a lesser rank, remembered that they were all cleaning ship and not smoking. He, it seemed, was elected.

Tramping across four fields and coming within hailing distance of his objective, he performed a precise military halt and released a barracks-square bellow of, "Hi, you!" He waved urgently.

The farmer stopped, wiped his forehead, looked around. His manner suggested that the mountainous bulk of the battleship was a mirage such as are five a penny around these parts. Bidworthy waved again, making it an authoritative summons. The farmer calmly waved back, got on with his plowing.

Sergeant major Bidworthy employed an expletive which—when its flames had died out—meant, "Dear me!" and marched fifty paces nearer. He could now see that the other was bushy-browed and leather-faced.

"Hi!"

Stopping the plow again, the farmer leaned on a shaft, picked his teeth.

Struck by the notion that perhaps during the last three centuries the old Earth-language had been dropped in favor of some other lingo, Bidworthy asked, "Can you understand me?"

"Can any person understand another?" inquired the farmer, with clear diction. He turned to resume his task.

Bidworthy was afflicted with a moment of confusion. Recovering, he informed hurriedly, "His Excellency, the Earth Ambassador, wishes to speak with you at once."

"So?" The other eyed him speculatively. "How come that he is excellent?"

"He is a person of considerable importance," said Bidworthy, unable to decide whether the other was being funny at his expense or alternatively was what is known as a character. A good many of these isolated planet-scratchers liked to think of themselves as characters.

"Of considerable importance," echoed the farmer, narrowing his eyes at the horizon. He appeared to be trying to grasp an alien concept. After a while, he inquired, "What will happen to your home world when this person dies?"

"Nothing," Bidworthy admitted.

"It will roll on as usual?"

"Of course."

"Then," declared the farmer, flatly, "he cannot be important." With that, his little engine went *chuff-chuff* and the wheels rolled forward and the plow plowed.

Digging his nails into the palms of his hands, Bidworthy spent half a minute gathering oxygen before he said, in hoarse tones, "I cannot return without at least a message for His Excellency."

"Indeed?" The other was incredulous. "What is to stop you?" Then, noting the alarming increase in Bidworthy's color, he added with compassion, "Oh, well, you may tell him that I said"—he paused while he thought it over—"God bless you and good-by!"

Sergeant major Bidworthy was a powerful man who weighed two-twenty pounds, had hopped around the cosmos for twenty years, and feared nothing. He had never been known to permit the shiver of one hair—but he was trembling all over by the time he got back to the ship.

His Excellency fastened a cold eye upon him and demanded, "Well?"

"He won't come." Bidworthy's veins stood out on his forehead. "And, sir, if only I could have him in my field company for a few months I'd straighten him up and teach him to move at the double."

"I don't doubt that, sergeant major," soothed His Excellency. He continued in a whispered aside to Colonel Shelton. "He's a good fellow but no diplomat. Too abrupt and harsh voiced. Better go yourself and fetch that farmer. We can't sit here forever waiting to find out where to begin."

"Very well, your excellency." Colonel Shelton trudged across the fields, caught up with the plow. Smil-

ing pleasantly, he said, "Good morning, my man!"

Stopping his plow, the farmer sighed as if it were another of those days one has sometimes. His eyes were dark-brown, almost black, as they looked at the other.

"What makes you think I'm *your* man?" he inquired.

"It is a figure of speech," explained Shelton. He could see what was wrong now. Bidworthy had fallen foul of an irascible type. Two dogs snarling at one another, Shelton went on, "I was only trying to be courteous."

"Well," meditated the farmer, "I reckon that's something worth trying for."

Pinking a little, Shelton continued with determination. "I am commanded to request the pleasure of your company at the ship."

"Think they'll get any pleasure out of my company?" asked the other, disconcertingly bland.

"I'm sure of it," said Shelton.

"You're a liar," said the farmer.

His color deepening, Colonel Shelton snapped, "I do not permit people to call me a liar."

"You've just permitted it," the other pointed out.

Letting it pass, Shelton insisted, "Are you coming to the ship or are you not?"

"I am not."

"Why not?"

"Myob!" said the farmer.

"What was that?"

"Myob!" he repeated. It smacked of a mild insult.

Colonel Shelton went back.

He told the ambassador, "That fellow is one of these too-clever types. All I could get out of him at the finish was 'myob,' whatever that means."

"Local slang," chipped in Captain Grayder. "An awful lot of it develops over three or four centuries. I've come across one or two worlds where there's been so much of it that one almost had to learn a new language."

"He understood your speech?" asked the ambassador, looking at Shelton.

"Yes, your excellency. And his own is quite good. But he won't come away from his plowing." He reflected briefly, then suggested, "If it were left to me, I'd bring him in by force, under an armed escort."

"That would encourage him to give essential information," commented the ambassador, with open sarcasm. He patted his stomach, smoothed his jacket, glanced down at his glossy shoes. "Nothing for it but to go speak to him myself."

Colonel Shelton was shocked. "Your excellency, you can't do *that!*"

"Why can't I?"

"It would be undignified."

"I am aware of it," said the ambassador, dryly. "Can you suggest an alternative?"

"We can send out a patrol to find someone more co-operative."

"Someone better informed, too," Captain Grayder offered. "At best

we wouldn't get much out of one surly hayseed. I doubt whether he knows a quarter of what we require to learn."

"All right." His Excellency abandoned the notion of doing his own chores. "Organize a patrol and let's have some results."

"A patrol," said Colonel Shelton to Major Hame. "Nominate one immediately."

"Call out a patrol," Hame ordered Lieutenant Deacon. "At once."

"Parade a patrol forthwith, sergeant major," said Deacon.

Bidworthy went to the ship, climbed a ladder, stuck his head in the lock and bawled, "Sergeant Gleed, out with your squad, and make it snappy!" He gave a suspicious sniff and went farther into the lock. His voice gained several more decibels. "Who's been smoking? By the Black Sack, if I catch—"

Across the fields something quietly went *chuff-chuff* while balloon tires crawled along.

The patrol formed by the right in two ranks of eight men each, turned at a barked command, marched off noseward. Their boots thumped in unison, their accoutrements clattered and the orange-colored sun made sparkles on their metal.

Sergeant Gleed did not have to take his men far. They had got one hundred yards beyond the battleship's nose when he noticed a man ambling across the field to his right. Treating the ship with utter indifference, the newcomer was making toward the farmer still plowing far over to the left.

"Patrol, right wheel!" yelled Gleed. Marching them straight past the wayfarer, he gave them a loud about-turn and followed it with the high-sign.

Speeding up its pace, the patrol opened its ranks, became a double file of men tramping at either side of the lone pedestrian. Ignoring his suddenly acquired escort, the latter continued to plod straight ahead like one long convinced that all is illusion.

"Left wheel!" Gleed roared, trying to bend the whole caboodle toward the waiting ambassador.

Swiftly obedient, the double file headed leftward, one, two, three, hup! It was neat, precise execution, beautiful to watch. Only one thing spoiled it: the man in the middle maintained his self-chosen orbit and ambled casually between numbers four and five of the right-hand file.

That upset Gleed, especially since the patrol continued to thump ambassadorwards for lack of a further order. His Excellency was being treated to the unmilitary spectacle of an escort dumbly boot-beating one way while its prisoner airily mooched another. Colonel Shelton would have plenty to say about it in due course, and anything he forgot Bidworthy would remember.

"Patrol!" hoarsed Gleed, pointing an outraged finger at the escapee, and momentarily dismissing all regulation commands from his mind. "Get that yimp!"

Breaking ranks, they moved at the double and surrounded the wanderer too closely to permit further progress. Perforce, he stopped.

Gleed came up, said somewhat breathlessly, "Look, the Earth Ambassador wants to speak to you—that's all."

The other said nothing, merely gazed at him with mild blue eyes. He was a funny looking bum, long overdue for a shave, with a fringe of ginger whiskers sticking out all around his pan. He resembled a sunflower.

"Are you going to talk with His Excellency?" Gleed persisted.

"Naw." The other nodded toward the farmer. "Going to talk with Zeke."

"The ambassador first," retorted Gleed, toughly. "He's a big noise."

"I don't doubt that," remarked the sunflower.

"Smartie Artie, eh?" said Gleed, pushing his face close and making it unpleasant. He gave his men a gesture. "All right—shove him along. We'll show him!"

Smartie Artie sat down. He did it sort of solidly, giving himself the aspect of a statue anchored for aeons. The ginger whiskers did nothing to lend grace to the situation. But Sergeant Gleed had handled sitters before, the only difference being that this one was cold sober.

"Pick him up," ordered Gleed, "and carry him."

They picked him up and carried him, feet first, whiskers last. He hung limp and unresisting in their hands, a dead weight. In this inauspicious manner he arrived in the presence of the Earth Ambassador where the escort plonked him on his feet.

Promptly he set out for Zeke.

"Hold him, darn you!" howled Gleed.

The patrol grabbed and clung tight. His Excellency eyed the whiskers with well-bred concealment of distaste, coughed delicately, and spoke.

"I am truly sorry that you had to come to me in this fashion."

"In that case," suggested the prisoner, "you could have saved yourself some mental anguish by not permitting it to happen."

"There was no other choice. We've got to make contact somehow."

"I don't see it," said Ginger Whiskers. "What's so special about this date?"

"The date?" His Excellency frowned in puzzlement. "Where does that come in?"

"That's what I'd like to know."

"The point eludes me." The ambassador turned to Colonel Shelton. "Do you get what he's aiming at?"

"I could hazard a guess, your excellency. I think he is suggesting that since we've left them without contact for more than three hundred years, there's no particular urgency about making it today." He looked at the sunflower for confirmation.

That worthy rallied to his sup-

port by remarking, "You're doing pretty well for a half-wit."

Regardless of Shelton's own reaction, this was too much for Bidworthy purpling nearby. His chest came up and his eyes caught fire. His voice was an authoritative rasp.

"Be more respectful while addressing high-ranking officers!"

The prisoner's mild blue eyes turned upon him in childish amazement, examined him slowly from feet to head and all the way down again. The eyes drifted back to the ambassador.

"Who is this preposterous person?"

Dismissing the question with an impatient wave of his hand, the ambassador said, "See here, it is not our purpose to bother you from sheer perversity, as you seem to think. Neither do we wish to detain you any longer than is necessary. All we—"

Pulling at his face-fringe as if to accentuate its offensiveness, the other interjected, "It being you, of course, who determines the length of the necessity?"

"On the contrary, you may decide that yourself," said the ambassador, displaying admirable self-control. "All you need do is tell—"

"Then I've decided it right now," the prisoner chipped in. He tried to heave himself free of his escort. "Let me go talk to Zeke."

"All you need do," the ambassador persisted, "is to tell us where we can find a local official who can put us in touch with your central government." His gaze was stern, commanding, as he added, "For instance, where is the nearest police post?"

"Myob!" said the other.

"The same to you," retorted the ambassador, his patience starting to evaporate.

"That's precisely what I'm trying to do," assured the prisoner, enigmatically. "Only you won't let me."

"If I may make a suggestion, your excellency," put in Colonel Shelton, "let me—"

"I require no suggestions and I won't let you," said the ambassador, rapidly becoming brusque. "I have had enough of all this tomfoolery. I think we've landed at random in an area reserved for imbeciles and it would be as well to recognize the fact and get out of it with no more delay."

"Now you're talking," approved Ginger Whiskers. "And the farther the better."

"I'm not thinking of leaving this planet if that's what is in your incomprehensible mind," asserted the ambassador, with much sarcasm. He stamped a proprietory foot on the turf. "This is part of the Earth Empire. As such, it is going to be recognized, charted and organized."

"Heah, heah!" put in the senior civil servant, who aspired to honors in elocution.

His Excellency threw a frown behind, went on, "We'll move the ship to some other section where brains are brighter." He signed to the escort. "Let him go. Doubtless he is in

a hurry to borrow a razor."

They released their grips. Ginger Whiskers at once turned toward the still-plowing farmer, much as if he were a magnetized needle irresistibly drawn Zekeward. Without a word he set off at his original mooching pace. Disappointment and disgust showed on the faces of Gleed and Bidworthy as they watched him go.

"Have the vessel shifted at once," the ambassador instructed Captain Grayder. "Plant it near a suitable town—not out in the wilds where every hayseed views strangers as a bunch of gyps."

He marched importantly up the gangway. Captain Grayder followed, then Colonel Shelton, then the elocutionist. Next, their successors in due order of precedence. Lastly, Gleed and his men.

The gangway rolled inward. The lock closed. Despite its immense bulk, the ship shivered briefly from end to end and soared without deafening uproar or spectacular display of flame.

Indeed, there was silence save for the plow going *chuff-chuff* and the murmurings of the two men walking behind it. Neither bothered to turn his head to observe what was happening.

"Seven pounds of prime tobacco is a heck of a lot to give for one case of brandy," Ginger Whiskers was protesting.

"Not for my brandy," said Zeke. "It's stronger than a thousand Gands and smoother than an Earthman's downfall."

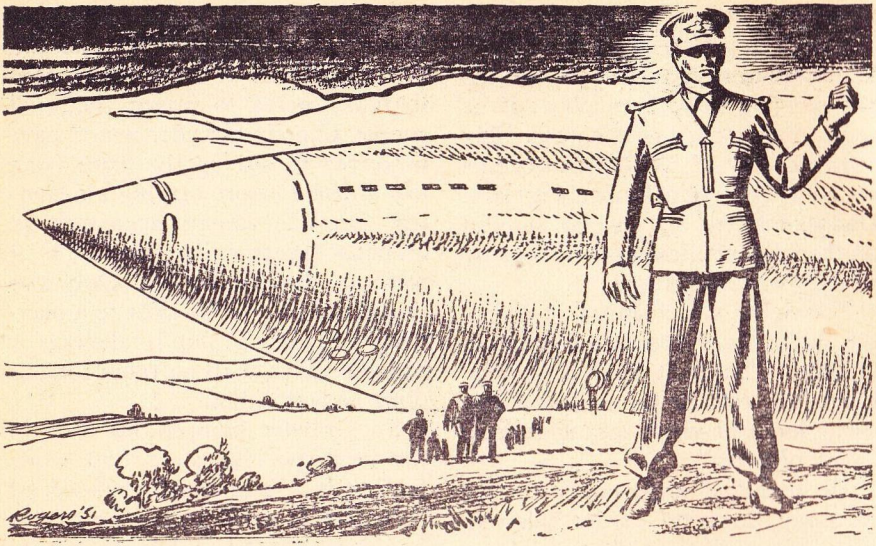
The great battleship's second touchdown was made on a wide flat one mile north of a town estimated to hold twelve to fifteen thousand people. Captain Grayder would have preferred to survey the place from low altitude before making his landing, but one cannot maneuver an immense space-going job as if it were an atmospheric tug. Only two things can be done so close to a planetary surface—the ship is taken up or brought down with no room for fiddling betweentimes.

So Grayder bumped his ship in the best spot he could find when finding is a matter of split-second decisions. It made a rut only twelve feet deep, the ground being harder and on a rock bed. The gangway was shoved out; the procession descended in the same order as before.

His Excellency cast an anticipatory look toward the town, registered disappointment and remarked, "Something's badly out of kilter here. There's the town. Here's us in plain view, with a ship like a metal mountain. A thousand people at least must have seen us even if the rest are holding seances behind drawn curtains or playing pinochle in the cellars. Are they excited?"

"It doesn't seem so," admitted Colonel Shelton, pulling an eyelid for the sake of feeling it spring back.

"I wasn't asking you. I was telling you. They are not excited. They are not surprised. In fact, they are not even interested. One would almost think they've had a ship here before and it was full of smallpox, or sold



them a load of gold bricks, or something like that. What is wrong with them?"

"Possibly they lack curiosity," Shelton offered.

"Either that or they're afraid. Or maybe the entire gang of them are crackers. A good many worlds were appropriated by woozy groups who wanted some place where their eccentricities could run loose. Nutty notions become conventional after three hundred years of undisturbed continuity. It's then considered normal and proper to nurse the bats out of your grandfather's attic. That, and generations of inbreeding, can create some queer types. But we'll cure 'em!"

"Yes, your excellency, most certainly we will."

"You don't look so balanced yourself, chasing that eye around your pan," reproved the ambassador. He pointed southeast as Shelton stuck the fidgety hand firmly into a pocket. "There's a road over there. Wide and well-built by the looks of it. Get that patrol across it. If they don't bring in a willing talker within reasonable time, we'll send a battalion into the town itself."

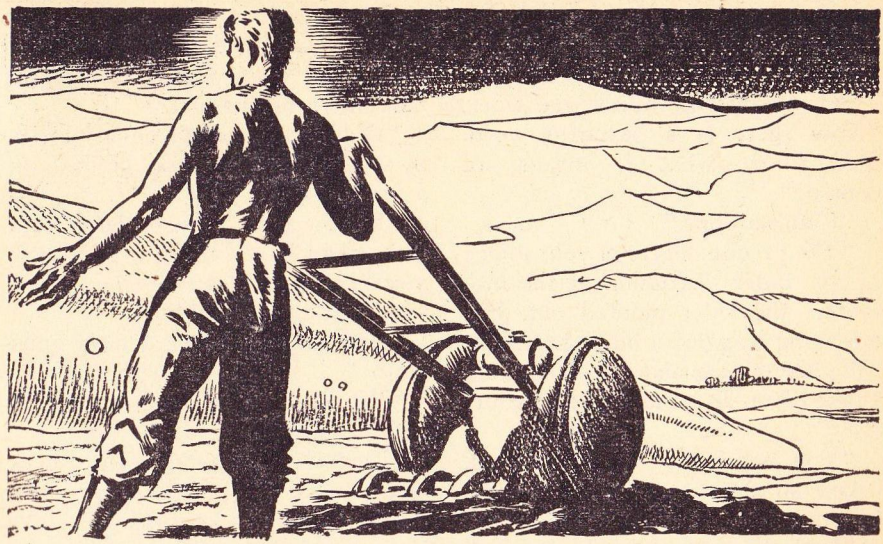
"A patrol," repeated Colonel Shelton to Major Hame.

"Call out the patrol," Hame ordered Lieutenant Deacon.

"That patrol again, sergeant major," said Deacon.

Bidworthy raked out Gleed and his men, indicated the road, barked a bit, shooed them on their way.

They marched, Gleed in the lead. Their objective was half a mile and angled slightly nearer the town. The



left-hand file, who had a clear view of the nearest suburbs, eyed them wistfully, wished Gleed in warmer regions with Bidworthy stoking beneath him.

Hardly had they reached their goal than a customer appeared. He came from the town's outskirts, zooming along at fast pace on a contraption vaguely resembling a motorcycle. It ran on a pair of big rubber balls and was pulled by a caged fan. Gleed spread his men across the road.

The oncomer's machine suddenly gave forth a harsh, penetrating sound that vaguely reminded them of Bidworthy in the presence of dirty boots.

"Stay put," warned Gleed. "I'll skin the guy who gives way and leaves a gap."

Again the shrill metallic warning. Nobody moved. The machine slowed, came up to them at a crawl and stopped. Its fan continued to spin at low rate, the blades almost visible and giving out a steady hiss.

"What's the idea?" demanded the rider. He was lean-featured, in his middle thirties, wore a gold ring in his nose and had a pigtail four feet long.

Blinking incredulously at this get-up, Gleed managed to jerk an indicative thumb toward the iron mountain and say, "Earth ship."

"Well, what d'you expect me to do about it?"

"Co-operate," said Gleed, still bemused by the pigtail. He had never seen one before. It was in no way effeminate, he decided. Rather did it lend a touch of ferocity like that

worn—according to the picture books—by certain North American aborigines of umpteen centuries ago.

"Co-operation," mused the rider. "Now there is a beautiful word. You know what it means, of course?"

"I ain't a dope."

"The precise degree of your idiocy is not under discussion at the moment," the rider pointed out. His nose-ring waggled a bit as he spoke. "We are talking about co-operation. I take it you do quite a lot of it yourself?"

"You bet I do," Gleed assured. "And so does everyone else who knows what's good for him."

"Let's keep to the subject, shall we? Let's not sidetrack and go rambling all over the map." He revved up his fan a little then let it slow down again. "You are given orders and you obey them?"

"Of course. I'd have a rough time if—"

"That is what you call co-operation?" put in the other. He shrugged his shoulders, indulged a resigned sigh. "Oh, well, it's nice to check the facts of history. The books *could* be wrong." His fan flashed into a circle of light and the machine surged forward. "Pardon me."

The front rubber ball barged forcefully between two men, knocking them sidewise without injury. With a high whine, the machine shot down the road, its fan-blast making the rider's plaited hairdo point horizontally backward.

"You goofy glumps!" raged Gleed as his fallen pair got up and dusted themselves. "I ordered you to stand fast. What d'you mean, letting him run out on us like that?"

"Didn't have much choice about it, sarge," answered one, giving him a surly look.

"I want none of your back-chat. You could have busted a balloon if you'd had your weapons ready. That would have stopped him."

"You didn't tell us to have guns ready."

"Where was your own, anyway?" added a voice.

Gleed whirled round on the others and bawled, "Who said that?" His irate eyes raked a long row of blank, impassive faces. It was impossible to detect the culprit. "I'll shake you up with the next quota of fatigues," he promised. "I'll see to it—"

"The sergeant major's coming," one of them warned.

Bidworthy was four hundred yards away and making martial progress toward them. Arriving in due time, he cast a cold, contemptuous glance over the patrol.

"What happened?"

Giving a brief account of the incident, Gleed finished aggrievedly, "He looked like a Chickasaw with an oil well."

"What's a Chickasaw?" Bidworthy demanded.

"I read about them somewhere once when I was a kid," explained Gleed, happy to bestow a modicum of learning. "They had long haircuts, wore blankets and rode around in gold-plated automobiles."

"Sounds crazy to me," said Bidworthy. "I gave up all that magic-carpet stuff when I was seven. I was deep in ballistics before I was twelve and military logistics at fourteen." He sniffed loudly, gave the other a jaundiced eye. "Some guys suffer from arrested development."

"They actually existed," Gleed maintained. "They—"

"So did fairies," snapped Bidworthy. "My mother said so. My mother was a good woman. She didn't tell me a lot of tomfool lies—often." He spat on the road. "Be your age!" Then he scowled at the patrol. "All right, get out your guns, assuming that you've got them and know where they are and which hand to hold them in. Take orders from me. I'll deal personally with the next one along."

He sat on a large stone by the roadside and planted an expectant gaze on the town. Gleed posed near him, slightly pained. The patrol remained strung across the road, guns held ready. Half an hour crawled by without anything happening.

One of the men said, "Can we have a smoke, sergeant major?"

"No."

They fell into lugubrious silence, watching the town, licking their lips and thinking. They had plenty to think about. A town—any town of human occupation — had desirable features not found elsewhere in the cosmos. Lights, company, freedom, laughter, all the makings of life. And one can go hungry too long.

Eventually a large coach came from the outskirts, hit the high road, came bowling toward them. A long, shiny, streamlined job, it rolled on twenty balls in two rows of ten, gave forth a whine similar to but louder than that of its predecessor, but had no visible fans. It was loaded with people.

At a point two hundred yards from the road block a loud-speaker under the vehicle's bonnet blared an urgent, "Make way! Make way!"

"This is it," commented Bidworthy, with much satisfaction. "We've got a dollop of them. One of them is going to chat or I leave the service." He got off his rock, stood in readiness.

"Make way! Make way!"

"Bust his bags if he tries to bull his way through," Bidworthy ordered the men.

It wasn't necessary. The coach lost pace, stopped with its bonnet a yard from the waiting file. Its driver peered out the side of his cab. Other faces snooped farther back.

Composing himself and determined to try the effect of fraternal cordiality, Bidworthy went up to the driver and said, "Good morning."

"Your time-sense is shot to pot," observed the other. He had a blue jowl, a broken nose, cauliflower ears, looked the sort who usually drives with others in hot and vengeful pursuit. "Can't you afford a watch?"

"Huh?"

"It isn't morning. It's late afternoon."

"So it is," admitted Bidworthy,

forcing a cracked smile. "Good afternoon."

"I'm not so sure about that," mused the driver, leaning on his wheel and moodily picking his teeth. "It's just another one nearer the grave."

"That may be," agreed Bidworthy, little taken with that ghoulish angle. "But I have other things to worry about, and—"

"Not much use worrying about anything, past or present," advised the driver. "Because there are lots bigger worries to come."

"Perhaps so," Bidworthy said, inwardly feeling that this was no time or place to contemplate the darker side of existence. "But I prefer to deal with my own troubles in my own time and my own way."

"Nobody's troubles are entirely their own, nor their time, nor their methods," remarked the tough looking oracle. "Are they now?"

"I don't know and I don't care," said Bidworthy, his composure thinning down as his blood pressure built up. He was conscious of Gleed and the patrol watching, listening, and probably grinning inside themselves. There was also the load of gaping passengers. "I think you are chewing the fat just to stall me. You might as well know now that it won't work. The Earth Ambassador is waiting—"

"So are we," remarked the driver, pointedly.

"He wants to speak to you," Bidworthy went on, "and he's going to speak to you!"

"I'd be the last to prevent him. We've got free speech here. Let him step up and say his piece so's we can get on our way."

"*You,*" Bidworthy informed, "are going to *him.*" He signed to the rest of the coach. "And your load as well."

"Not me," denied a fat man, sticking his head out of a side window. He wore thick-lensed glasses that gave him eyes like poached eggs. Moreover, he was adorned with a high hat candy-striped in white and pink. "Not me," repeated this vision, with considerable firmness.

"Me, neither," indorsed the driver.

"All right." Bidworthy registered menace. "Move this birdcage an inch, forward or backward, and we'll shoot your pot-bellied tires to thin strips. Get out of that cab."

"Not me. I'm too comfortable. Try fetching me out."

Bidworthy beckoned to his nearest six men. "You heard him—take him up on that."

Tearing open the cab door, they grabbed. If they had expected the victim to put up a futile fight against heavy odds, they were disappointed. He made no attempt to resist. They got him, lugged together, and he yielded with good grace, his body leaning sidewise and coming halfway out of the door.

That was as far as they could get him.

"Come on," urged Bidworthy, displaying impatience. "Show him

who's who. He isn't a fixture."

One of the men climbed over the body, poked around inside the cab, and said, "He is, you know."

"What d'you mean?"

"He's chained to the steering column."

"Eh? Let me see." He had a look, found that it was so. A chain and a small but heavy and complicated padlock linked the driver's leg to his coach. "Where's the key?"

"Search me," invited the driver, grinning.

They did just that. The frisk proved futile. No key.

"Who's got it?"

"Myob!"

"Shove him back into his seat," ordered Bidworthy, looking savage. "We'll take the passengers. One yap's as good as another so far as I'm concerned." He strode to the doors, jerked them open. "Get out and make it snappy."

Nobody budged. They studied him silently and with varied expressions, not one of which did anything to help his ego. The fat man with the candy-striped hat mooned at him sardonically. Bidworthy decided that he did not like the fat man and that a stiff course of military calisthenics might thin him down a bit.

"You can come out on your feet," he suggested to the passengers in general and the fat man in particular, "or on your necks. Whichever you prefer. Make up your minds."

"If you can't use your head you can at least use your eyes," commented the fat man. He shifted in his seat to the accompaniment of metallic clanking noises.

Bidworthy did as suggested, leaning through the doors to have a gander. Then he got right into the vehicle, went its full length and studied each passenger. His florid features were two shades darker when he came out and spoke to Sergeant Gleed.

"They're all chained. Every one of them." He glared at the driver. "What's the big idea, manacling the lot?"

"Myob!" said the driver, airily.

"Who's got the keys?"

"Myob!"

Taking a deep breath, Bidworthy said to nobody in particular, "Every so often I hear of some guy running amok and laying 'em out by the dozens. I always wonder why—but now I know." He gnawed his knuckles, then added to Gleed, "We can't run this contraption to the ship with that dummy blocking the driver's seat. Either we must find the keys or get tools and cut them loose."

"Or you could wave us on our way and go take a pill," offered the driver.

"Shut up! If I'm stuck here another million years I'll see to it that—"

"The colonel's coming," muttered Gleed, giving him a nudge.

Colonel Shelton arrived, walked once slowly and officiously around the outside of the coach, examining its construction and its occupants.

He flinched at the striped hat whose owner leered at him through the glass. Then he came over to the disgruntled group.

"What's the trouble this time, sergeant major?"

"They're as crazy as the others, sir. They give a lot of lip and say, 'Myob!' and couldn't care less about his excellency. They don't want to come out and we can't get them out because they're chained to their seats."

"Chained?" Shelton's eyebrows shot upward. "What for?"

"I don't know, sir. They're linked in like a load of lifers making for the pen, and—"

Shelton moved off without waiting to hear the rest. He had a look for himself, came back.

"You may have something there, sergeant major. But I don't think they are criminals."

"No, sir?"

"No." He threw a significant glance toward the colorful headgear and several other sartorial eccentricities, including a ginger-haired man's foot-wide polka-dotted bow. "It is more likely that they're a bunch of whacks being taken to a giggle emporium. I'll ask the driver." Going to the cab, he said, "Do you mind telling me your destination?"

"Yes," responded the other.

"Very well, where is it?"

"Look," said the driver, "are we talking the same language?"

"Huh?"

"You asked me if I minded and I said yes." He made a gesture. "I do mind."

"You refuse to tell?"

"Your aim's improving, sonny."

"Sonny?" put in Bidworthy, vibrant with outrage. "Do you realize you are speaking to a colonel?"

"Leave this to me," insisted Shelton, waving him down. His expression was cold as he returned his attention to the driver. "On your way. I'm sorry you've been detained."

"Think nothing of it," said the driver, with exaggerated politeness. "I'll do as much for you some day."

With that enigmatic remark, he let his machine roll forward. The patrol parted to make room. The coach built up its whine to top note, sped down the road, diminished into the distance.

"By the Black Sack!" swore Bidworthy, staring purple-faced after it. "This planet has got more punks in need of discipline than any this side of—"

"Calm yourself, sergeant major," advised Shelton. "I feel the same way as you—but I'm taking care of my arteries. Blowing them full of bumps like seaweed won't solve any problems."

"Maybe so, sir, but—"

"We're up against something mighty funny here," Shelton went on. "We've got to find out exactly what it is and how best to cope with it. That will probably mean new tactics. So far, the patrol has achieved nothing. It is wasting its time. We'll have to devise some other and more effective method of making contact

with the powers-that-be. March the men back to the ship, sergeant major."

"Very well, sir." Bidworthy saluted, swung around, clicked his heels, opened a cavernous mouth. "Patro-o-ol! . . . right form!"

The conference lasted well into the night and halfway through the following morning. During these argumentative hours various oddments of traffic, mostly vehicular, passed along the road, but nothing paused to view the monster spaceship, nobody approached for a friendly word with its crew. The strange inhabitants of this world seemed to be afflicted with a peculiar form of mental blindness, unable to see a thing until it was thrust into their faces and then surveying it squint-eyed.

One passer-by in midmorning was a truck whining on two dozen rubber balls and loaded with girls wearing colorful head-scarves. The girls were singing something about one little kiss before we part, dear. Half a dozen troops lounging near the gangway came eagerly to life, waved, whistled and yoohooed. The effort was wasted, for the singing continued without break or pause and nobody waved back.

To add to the discomfiture of the love-hungry, Bidworthy stuck his head out of the lock and rasped, "If you monkeys are bursting with surplus energy, I can find a few jobs for you to do—nice dirty ones." He seared them one at a time before he withdrew.

Inside, the top brass sat around a horseshoe table in the chartroom near the bow and debated the situation. Most of them were content to repeat with extra emphasis what they had said the previous evening, there being no new points to bring up.

"Are you certain," the Earth Ambassador asked Captain Grayder, "that this planet has not been visited since the last emigration transport dumped the final load three hundred years back?"

"Positive, your excellency. Any such visit would have been recorded."

"If made by an Earth ship. But what about others? I feel it in my bones that at sometime or other these people have fallen foul of one or more vessels calling unofficially and have been leery of spaceships ever since. Perhaps somebody got tough with them, tried to muscle in where he wasn't wanted. Or they've had to beat off a gang of pirates. Or they were swindled by some unscrupulous fleet of traders."

"Quite impossible, your excellency," declared Grayder. "Emigration was so scattered over so large a number of worlds that even today every one of them is under-populated, only one-hundredth developed, and utterly unable to build spaceships of any kind, even rudimentary ones. Some may have the techniques but not the facilities, of which they need plenty."

"Yes, that's what I've always understood."

"All Blieder-drive vessels are built in the Sol system, registered as Earth ships and their whereabouts known. The only other ships in existence are eighty or ninety antiquated rocket jobs bought at scrap price by the Epsilon system for haulage work between their fourteen closely-planned planets. An old-fashioned rocket job couldn't reach this place in a hundred years."

"No, of course not."

"Unofficial boats capable of this range just don't exist," Grayder assured. "Neither do space buccaneers, for the same reason. A Blieder-job takes so much that a would-be pirate has to become a billionaire to become a pirate."

"Then," said the ambassador, heavily, "back we go to my original theory—that something peculiar to this world plus a lot of inbreeding has made them nutty."

"There's plenty to be said for that notion," put in Colonel Shelton. "You should have seen the coach load I looked over. There was a mortician wearing odd shoes, one brown, one yellow. And a moon-faced gump sporting a hat made from the skin of a barber's pole, all stripy. Only thing missing was his bubble pipe—and probably he'll be given that where he was going."

"Where was he going?"

"I don't know, your excellency. They refused to say."

Giving him a satirical look, the ambassador remarked, "Well, that is a valuable addition to the sum total of our knowledge. Our minds are now enriched by the thought that an anonymous individual may be presented with a futile object for an indefinable purpose when he reaches his unknown destination."

Shelton subsided, wishing that he had never seen the fat man or, for that matter, the fat man's cockeyed world.

"Somewhere they've got a capitol, a civic seat, a center of government wherein function the people who hold the strings," the ambassador asserted. "We've got to find that place before we can take over and reorganize on up-to-date lines whatever setup they've got. A capitol is big by the standards of its own administrative area. It's never an ordinary, nondescript place. It has certain physical features lending it importance above the average. It should be easily visible from the air. We must make a search for it—in fact, that's what we ought to have done in the first place. Other planets' capitol cities have been found without trouble. What's the hoodoo on this one?"

"See for yourself, your excellency." Captain Grayder poked a couple of photographs across the table. "There are the two hemispheres as recorded by us when coming in. They reveal nothing resembling a superior city. There isn't even a town conspicuously larger than its fellows or possessing outstanding features setting it apart from the others."

"I don't place great faith in pictures, particularly when taken at

long distance. The naked eye sees more. We have got four lifeboats capable of scouring the place from pole to pole. Why not use them?"

"Because, your excellency, they were not designed for such a purpose."

"Does that matter so long as they get results?"

Grayder said, patiently, "They were designed to be launched in space and hit up forty thousand. They are ordinary, old-style rocket jobs, for emergencies only. You could not make efficient ground-survey at any speed in excess of four hundred miles per hour. Keep the boats down to that and you're trying to run them at landing-speed, muffling the tubes, balling up their efficiency, creating a terrible waste of fuel, and inviting a crash which you're likely to get before you're through."

"Then it's high time we had Blieder-drive lifeboats on Blieder-drive ships."

"I agree, your excellency. But the smallest Blieder engine has an Earth mass of more than three hundred tons—far too much for little boats." Picking up the photographs, Grayder slid them into a drawer. "What we need is an ancient, propeller-driven airplane. They could do something we can't do—they could go slow."

"You might as well yearn for a bicycle," scoffed the ambassador, feeling thwarted.

"We have a bicycle," Grayder informed. "Tenth Engineer Harrison owns one."

"And he has brought it with him?"

"It goes everywhere with him. There is a rumor that he sleeps with it."

"A spaceman toting a bicycle!" The ambassador blew his nose with a loud honk. "I take it that he is thrilled by the sense of immense velocity it gives him, an ecstatic feeling of rushing headlong through space?"

"I wouldn't know, your excellency."

"Hm-m-m! Bring this Harrison in to me. We'll set a nut to catch a nut."

Grayder blinked, went to the caller board, spoke over the ship's system. "Tenth Engineer Harrison wanted in the chartroom immediately."

Within ten minutes Harrison appeared. He had walked fast three-quarters of a mile from the Blieder room. He was thin and wiry, with dark, monkeylike eyes, and a pair of ears that cut out the pedaling with the wind behind him. The ambassador examined him curiously, much as a zoologist would inspect a pink giraffe.

"Mister, I understand that you possess a bicycle."

Becoming wary, Harrison said, "There's nothing against it in the regulations, sir, and therefore—"

"Darn the regulations!" The ambassador made an impatient gesture. "We're stalled in the middle of a crazy situation and we're turning to crazy methods to get moving."

"I see, sir."

"So I want you to do a job for me. Get out your bicycle, ride down to town, find the mayor, sheriff, grand panjandrum, supreme galootie, or whatever he's called, and tell him he's officially invited to evening dinner along with any other civic dignitaries he cares to bring and, of course, their wives."

"Very well, sir."

"Informal attire," added the ambassador.

Harrison jerked up one ear, drooped the other, and said, "Beg pardon, sir?"

"They can dress how they like."

"I get it. Do I go right now, sir?"

"At once. Return as quickly as you can and bring me the reply."

Saluting sloppily, Harrison went out. His excellency found an easy-chair, reposed in it at full length and ignored the others' stares.

"As easy as that!" He pulled out a long cigar, carefully bit off its end. "If we can't touch their minds, we'll appeal to their bellies." He cocked a knowing eye at Grayder. "Captain, see that there is plenty to drink. Strong stuff. Venusian cognac or something equally potent. Give them an hour at a well-filled table and they'll talk plenty. We won't be able to shut them up all night." He lit the cigar, puffed luxuriously. "That is the tried and trusted technique of diplomacy—the insidious seduction of the distended gut. It always works—you'll see."

Pedaling briskly down the road, Tenth Engineer Harrison reached the first street on either side of which were small detached houses with neat gardens front and back. A plump, amiable looking woman was clipping a hedge halfway along. He pulled up near to her, politely touched his cap.

"'Scuse me, ma'am, I'm looking for the biggest man in town."

She half-turned, gave him no more than a casual glance, pointed her clipping-shears southward. "That'd be Jeff Baines. First on the right, second on the left. It's a small delicatessen."

"Thank you."

He moved on, hearing the *snip-snip* resume behind him. First on the right. He curved around a long, low, rubber-balled truck parked by the corner. Second on the left. Three children pointed at him and yelled shrill warnings that his back wheel was going round. He found the delicatessen, propped a pedal on the curb, gave his machine a reassuring pat before he went inside and had a look at Jeff.

There was plenty to see. Jeff had four chins, a twenty-two-inch neck, and a paunch that stuck out half a yard. An ordinary mortal could have got into either leg of his pants without taking off a diving suit. He weighed at least three hundred and undoubtedly *was* the biggest man in town.

"Wanting something?" inquired Jeff, lugging it up from far down.

"Not exactly." Tenth Engineer Harrison eyed the succulent food

display, decided that anything unsold by nightfall was not given to the cats. "I'm looking for a certain person."

"Are you now? Usually I avoid that sort—but every man to his taste." He plucked at a fat lip while he mused a moment, then suggested, "Try Sid Wilcock over on Dane Avenue. He's the most certain man I know."

"I didn't mean it that way," said Harrison. "I meant I was searching for somebody particular."

"Then why the dub didn't you say so?" Jeff Baines worked over the new problem, finally offered, "Tod Green ought to fit that bill. You'll find him in the shoeshop end of this road. He's particular enough for anyone. He's downright finicky."

"You misunderstand me," Harrison explained. "I'm hunting a bigwig so's I can invite him to a feed."

Resting himself on a high stool which he overlapped by a foot all round, Jeff Baines eyed him peculiarly and said, "There's something lopsided about this. In the first place, you're going to use up a considerable slice of your life finding a guy who wears a wig, especially if you insist on a big one. And where's the point of dumping an ob on him just because he uses a bean-blanket?"

"Huh?"

"It's plain common sense to plant an ob where it will cancel an old one out, isn't it?"

"Is it?" Harrison let his mouth hang open while his mind moiled around the strange problem of how to plant an ob.

"So you don't know?" Jeff Baines massaged a plump chop and sighed. He pointed at the other's middle. "Is that a uniform you're wearing?"

"Yes."

"A genuine, pukka, dyed-in-the-wool uniform?"

"Of course."

"Ah!" said Jeff. "That's where you've fooled me—coming in by yourself, on your ownsome. If there had been a gang of you dressed identically the same, I'd have known at once it was a uniform. That's what uniform means—all alike. Doesn't it?"

"I suppose so," agreed Harrison, who had never given it a thought.

"So you're off that ship. I ought to have guessed it in the first place. I must be slow on the uptake today. But I didn't expect to see one, just one, messing around on a pedal contraption. It goes to show, doesn't it?"

"Yes," said Harrison, glancing around to make sure that no confederate had swiped his bicycle while he was detained in conversation. The machine was still there. "It goes to show."

"All right, let's have it—what have you come here for?"

"I've been trying to tell you all along. I've been sent to—"

"Been sent?" Jeff's eyes widened a little. "Mean to say you actually let yourself be *sent?*"

Harrison gaped at him. "Of course. Why not?"

"Oh, I get it now," said Jeff Baines, his puzzled features suddenly clearing. "You confuse me with the queer way you talk. You mean you planted an ob on someone?"

Desperately, Harrison said, "What's an ob?"

"He doesn't know," commented Jeff Baines, looking prayerfully at the ceiling. "He doesn't even know that!" He gave out a resigned sigh. "You hungry by any chance?"

"Going on that way."

"O.K. I could tell you what an ob is, but I'll do something better—I'll show you." Heaving himself off the stool, he waddled to a door at back. "Don't know why I should bother to try educate a uniform. It's just that I'm bored. C'mon, follow me."

Obediently, Harrison went behind the counter, paused to give his bicycle a reassuring nod, trailed the other through a passage and into a yard.

Jeff Baines pointed to a stack of cases. "Canned goods." He indicated an adjacent store. "Bust 'em open and pile the stuff in there. Stack the empties outside. Please yourself whether you do it or not. That's freedom, isn't it?" He lumbered back into the shop.

Left by himself, Harrison scratched his ears and thought it over. Somewhere, he felt, there was an obscure sort of gag. A candidate named Harrison was being tempted to qualify for his sucker certificate. But if the play was beneficial to its organizer it might be worth learning because the trick could then be passed on. One must speculate in order to accumulate.

So he dealt with the cases as required. It took him twenty minutes of brisk work, after which he returned to the shop.

"Now," explained Baines, "you've done something for me. That means you've planted an ob on me. I don't thank you for what you've done. There's no need to. All I have to do is get rid of the ob."

"Ob?"

"Obligation. Why use a long word when a short one is good enough? An obligation is an ob. I shift it this way: Seth Warburton, next door but one, has got half a dozen of my obs saddled on him. So I get rid of mine to you and relieve him of one of his to me by sending you around for a meal." He scribbled briefly on a slip of paper. "Give him this."

Harrison stared at it. In casual scrawl, it read, "Feed this bum. Jeff Baines."

Slightly dazed, he wandered out, stood by the bicycle and again eyed the paper. Bum, it said. He could think of several on the ship who would have exploded with wrath over that. His attention drifted to the second shop farther along. It had a window crammed with comestibles and two big words on the sign-strip above: *Seth's Gulper.*

Coming to a decision which was encouraged by his innards, he went into Seth's still holding the paper as if it were a death warrant. Inside there was a long counter, some steam

and a clatter of crockery. He chose a seat at a marble-topped table occupied by a gray-eyed brunette.

"Do you mind?" he inquired politely, as he lowered himself into a chair.

"Mind what?" She examined his ears as if they were curious phenomena. "Babies, dogs, aged relations or going out in the rain?"

"Do you mind me being here?"

"I can please myself whether or not I endure it. That's freedom, isn't it?"

"Yeah," said Harrison. "Sure it is." He fidgeted in his seat, feeling somehow that he'd made a move and promptly lost a pawn. He sought around for something else to say and at that point a thin-featured man in a white coat dumped before him a plate loaded with fried chicken and three kinds of unfamiliar vegetables.

The sight unnerved him. He couldn't remember how many years it was since he last saw fried chicken, nor how many months since he'd had vegetables in other than powder form.

"Well," said the waiter, mistaking his fascinated gaze upon the food. "Doesn't it suit you?"

"Yes." Harrison handed over the slip of paper. "You bet it does."

Glancing at the note, the other called to someone semivisible in the steam at one end of the counter, "You've killed another of Jeff's." He went away, tearing the slip into small pieces.

"That was a fast pass," commented the brunette, nodding at the loaded plate. "He dumps a feed-ob on you and you bounce it straight back, leaving all quits. I'll have to wash dishes to get rid of mine, or kill one Seth has got on somebody else."

"I stacked a load of canned stuff." Harrison picked up knife and fork, his mouth watering. There were no knives and forks on the ship. They weren't needed for powders and pills. "Don't give you any choice here, do they? You take what you get."

"Not if you've got an ob on Seth," she informed. "In that case, he's got to work it off best way he can. You should have put that to him instead of waiting for fate and complaining afterward."

"I'm not complaining."

"It's your right. That's freedom, isn't it?" She mused a bit, went on, "Isn't often I'm a plant ahead of Seth, but when I am I scream for iced pineapple and he comes running. When *he's* a plant ahead, *I* do the running." Her gray eyes narrowed in sudden suspicion, and she added, "You're listening like it's all new to you. Are you a stranger here?"

He nodded, his mouth full of chicken. A little later he managed, "I'm off that spaceship."

"Good grief!" She froze considerably. "An Antigand! I wouldn't have thought it. Why, you look almost human."

"I've long taken pride in that similarity," his wit rising along with his belly. He chewed, swallowed, looked around. The white-coated man came

up. "What's to drink?" Harrison asked.

"Dith, double-dith, shemak or coffee."

"Coffee. Big and black."

"Shemak is better," advised the brunette as the waiter went away. "But why should I tell you?"

The coffee came in a pint-sized mug. Dumping it, the waiter said, "It's your choice seeing Seth's working one off. What'll you have for after—apple pie, yimpik delice, grated tarfelsoufers or canimelon in syrup?"

"Iced pineapple."

"Ugh!" The other blinked at Harrison, gave the brunette an accusing stare, went away and got it.

Harrison pushed it across. "Take the plunge and enjoy yourself."

"It's yours."

"Couldn't eat it if I tried." He dug up another load of chicken, stirred his coffee, began to feel at peace with the world. "Got as much as I can manage right here." He made an inviting motion with his fork. "G'wan, be greedy and to heck with the waistline."

"No." Firmly she pushed the pineapple back at him. "If I got through that, I'd be loaded with an ob."

"So what?"

"I don't let strangers plant obs on me."

"Quite right, too. Very proper of you," approved Harrison. "Strangers often have strange notions."

"You've been around," she agreed. "Only I don't know what's strange about the notions."

"Dish washer!"

"Eh?"

"Cynic," he translated. "One washes dishes in a cynic." The pineapple got another pass in her direction. "If you feel I'll be dumping an ob which you'll have to pay off, you can do it in seemly manner right here. All I want is some information. Just tell me where I can put my finger on the ripest cheese in the locality."

"That's an easy one. Go round to Alec Peters' place, middle of Tenth Street." With that, she dug into the dish.

"Thanks. I was beginning to think everyone was dumb or afflicted with the funnies."

He carried on with his own meal, finished it, lay back expansively. Unaccustomed nourishment got his brain working a bit more dexterously, for after a minute an expression of deep suspicion clouded his face and he inquired, "Does this Peters run a cheese warehouse?"

"Of course." Emitting a sigh of pleasure, she put aside her empty dish.

He groaned low down, then informed, "I'm chasing the mayor."

"What is that?"

"Number one. The big boss. The sheriff, pohanko, or whatever you call him."

"I'm no wiser," she said, genuinely puzzled.

"The man who runs this town. The leading citizen."

"Make it a little clearer," she sug-

gested, trying hard to help him. "Who or what should this citizen be leading?"

"You and Seth and everyone else." He waved a hand to encompass the entire burg.

Frowning, she said, "Leading us *where?*"

"Wherever you're going."

She gave up, beaten, and signed the white-coated waiter to come to her assistance.

"Matt, are we going any place?"

"How should I know?"

"Well, ask Seth then."

He went away, came back with, "Seth says he's going home at six o'clock and what's it to you?"

"Anyone leading him there?" she inquired.

"Don't be daft," Matt advised. "He knows his own way and he's cold sober."

Harrison chipped in with, "Look, I don't see why there should be so much difficulty about this. Just tell me where I can find an official, any official—the police chief, the city treasurer, the mortuary keeper or even a mere justice of the peace."

"What's an official?" asked Matt, openly puzzled.

"What's a justice of the peace?" added the brunette.

His mind side-slipped and did a couple of spins. It took him quite a while to reassemble his thoughts and try another tack.

"Supposing," he said to Matt, "this joint catches fire. What would you do?"

"Fan it to keep it going," re-

sponded Matt, fed up and making no effort to conceal the fact. He returned to the counter with the air of one who has no time to waste on half-wits.

"He'd put it out," informed the brunette. "What else would you expect him to do?"

"Supposing he couldn't?"

"He'd call in others to help him."

"And would they?"

"Of course," she assured, surveying him with pity. "They'd jump at the chance. They'd be planting a nice crop of strong obs, wouldn't they?"

"Yes, I guess so." He began to feel stalled, but made a last shot at the problem. "What if the fire were too big and fast for passers-by to tackle?"

"Seth would summon the fire squad."

Defeat receded. A touch of triumph replaced it.

"Ah, so there is a fire squad! That's what I meant by something official. That's what I've been after all along. Quick, tell me where I can find the depot."

"Bottom end of Twelfth. You can't miss it."

"Thanks." He got up in a hurry. "See you again sometime." Going out fast, he grabbed his bicycle, shoved off from the curb.

The fire depot was a big place holding four telescopic ladders, a spray tower and two multiple pumps, all motorized on the usual array of fat rubber balls. Inside, Harrison came face to face with a small man wearing immense plus fours.

"Looking for someone?" asked the small man.

"The fire chief," said Harrison.

"Who's he?"

By this time prepared for that sort of thing, Harrison spoke as one would to a child. "See here, mister, this is a fire-fighting outfit. Somebody bosses it. Somebody organizes the shebang, fills forms, presses buttons, recommends promotions, kicks the shiftless, takes all the credit, transfers all the blame and generally lords it around. He's the most important guy in the bunch and everybody knows it." His forefinger tapped the other's chest. "And he's the fella I'm going to talk to if it's the last thing I do."

"Nobody's any more important than anyone else. How can they be? I think you're crazy."

"You're welcome to think what you like, but I'm telling you that—"

A shrill bell clamored, cutting off the sentence. Twenty men appeared as if by magic, boarded a ladder and a multi-pump, roared into the street.

Squat, basin-shaped helmets were the crews' only item of common attire. Apart from these, they plumbed the depths of sartorial iniquity. The man with the plus fours, who had gained the pump in one bold leap, was whirled out standing between a fat firefighter wearing a rainbow-hued cummerbund and a thin one sporting a canary yellow kilt. A latecomer decorated with earrings shaped like little bells hotly pursued

the pump, snatched at its tailboard, missed, disconsolately watched the outfit disappear from sight. He mooched back, swinging his helmet in one hand.

"Just my lousy luck," he informed the gaping Harrison. "The sweetest call of the year. A big brewery. The sooner they get there the bigger the obs they'll plant on it." He licked his lips at the thought, sat on a coil of canvas hose. "Oh, well, maybe it's all for the good of my health."

"Tell me something," Harrison insisted. "How do you get a living?"

"There's a heck of a question. You can see for yourself. I'm on the fire squad."

"I know. What I mean is, who pays you?"

"Pays me?"

"Gives you money for all this."

"You talk kind of peculiar. What is money?"

Harrison rubbed his cranium to assist the circulation of blood through the brain. What is money? Yeouw. He tried another angle.

"Supposing your wife needs a new coat, how does she get it?"

"Goes to a store saddled with fire-obs, of course. She kills one or two for them."

"But what if no clothing store has had a fire?"

"You're pretty ignorant, brother. Where in this world do you come from?" His ear bells swung as he studied the other a moment, then went on, "Almost all stores have fire-obs. If they've any sense, they allocate so many per month by way of insurance. They look ahead, just in case, see? They plant obs on us, in a way, so that when we rush to the rescue we've got to kill off a dollop of theirs before we can plant any new ones of our own. That stops us overdoing it and making hogs of ourselves. Sort of cuts down the stores' liabilities. It makes sense, doesn't it?"

"Maybe, but—"

"I get it now," interrupted the other, narrowing his eyes. "You're from that spaceship. You're an Anti-gand."

"I'm a Terran," said Harrison with suitable dignity. "What's more, all the folk who originally settled this planet were Terrans."

"You trying to teach me history?" He gave a harsh laugh. "You're wrong. There was a five per cent strain of Martian."

"Even the Martians are descended from Terran settlers," riposted Harrison.

"So what? That was a devil of a long time back. Things change, in case you haven't heard. We've no Terrans or Martians on this world—except for your crowd which has come in unasked. We're all Gands here. And you nosey pokes are Anti-gands."

"We aren't anti-anything that I know of. Where did you get that idea?"

"Myob!" said the other, suddenly determined to refuse further agreement. He tossed his helmet to one side, spat on the floor.

"Huh?"

"You heard me. Go trundle your scooter."

Harrison gave up and did just that. He pedaled gloomily back to the ship.

His Excellency pinned him with an authoritative optic. "So you're back at last, mister. How many are coming and at what time?"

"None, sir," said Harrison, feeling kind of feeble.

"None?" August eyebrows rose up. "Do you mean that they have refused my invitation?"

"No, sir."

The ambassador waited a moment, then said, "Come out with it, mister. Don't stand there gawping as if your push-and-puff contraption has just given birth to a roller skate. You say they haven't refused my invitation—but nobody is coming. What am I to make of that?"

"I didn't ask anyone."

"So you didn't ask!" Turning, he said to Grayder, Shelton and the others, "He didnt' ask!" His attention came back to Harrison. "You forgot all about it, I presume? Intoxicated by liberty and the power of man over machine, you flashed around the town at nothing less than eighteen miles per hour, creating consternation among the citizenry, tossing their traffic laws into the ash can, putting persons in peril of their lives, not even troubling to ring your bell or—"

"I haven't got a bell, sir," denied Harrison, inwardly resenting this list of enormities. "I have a whistle operated by rotation of the rear wheel."

"There!" said the ambassador, like one abandoning all hope. He sat down, smacked his forehead several times. "Somebody's going to get a bubble-pipe." He pointed a tragic finger. "And *he's* got a whistle."

"I designed it myself, sir," Harrison told him, very informatively.

"I'm sure you did. I can imagine it. I would expect it of you." The ambassador got a fresh grip on himself. "Look, mister, tell me something in strict confidence, just between you and me." He leaned forward, put the question in a whisper that ricocheted seven times around the room. "*Why* didn't you ask anyone?"

"Couldn't find anyone to ask, sir. I did my level best but they didn't seem to know what I was talking about. Or they pretended they didn't."

"Humph!" His Excellency glanced out of the nearest port, consulted his wrist watch. "The light is fading already. Night will be upon us pretty soon. It's getting too late for further action." An annoyed grunt. "Another day gone to pot. Two days here and we're still fiddling around." His eye was jaundiced as it rested on Harrison. "All right, mister, we're wasting time anyway so we might as well hear your story in full. Tell us what happened in complete detail. That way, we may be able to dig some sense out of it."

Harrison told it, finishing, "It

seemed to me, sir, that I could go on for weeks trying to argue it out with people whose brains are oriented east-west while mine points north-south. You can talk with them from now to doomsday, even get real friendly and enjoy the conversation —without either side knowing what the other is jawing about."

"So it seems," commented the ambassador, dryly. He turned to Captain Grayder. "You've been around a lot and seen many new worlds in your time. What do you make of all this twaddle, if anything?"

"A problem in semantics," said Grayder, who had been compelled by circumstances to study that subject. "One comes across it on almost every world that has been long out of touch, though usually it has not developed far enough to get really tough." He paused reminiscently. "First guy we met on Basileus said, cordially and in what he fondly imagined was perfect English, 'Joy you unboot now!' "

"Yeah? What did that mean?"

"Come inside, put on your slippers and be happy. In other words, welcome! It wasn't difficult to get, your excellency, especially when you expect that sort of thing." Grayder cast a thoughtful glance at Harrison, went on, "Here, things appear to have developed to a greater extreme. The language remains fluent, retains enough surface similarities to conceal deeper changes, but meanings have been altered, concepts discarded, new ones substituted, thought-forms re-angled — and, of course, there is the inevitable impact of locally developed slang."

"Such as 'myob,'" offered His Excellency. "Now there's a queer word without recognizable Earth root. I don't like the way they use it. Sounds downright insulting. Obviously it has some sort of connection with these obs they keep batting around. It means 'my obligation' or something like that, but the significance beats me."

"There is no connection, sir," Harrison contradicted. He hesitated, saw they were waiting for him, plunged boldly on. "Coming back I met the lady who directed me to Baines' place. She asked whether I'd found him and I said yes, thank you. We chatted a bit. I asked her what 'myob' meant. She said it was initial-slang." He stopped at that point.

"Keep going," advised the ambassador. "After some of the sulphurous comments I've heard coming out the Blieder-room ventilation-shaft, I can stomach anything. What does it mean?"

"M-y-o-b," informed Harrison, blinking. "Mind your own business."

"So!" His excellency gained color. "So that's what they've been telling me all along?"

"I'm afraid so, sir."

"Evidently they've a lot to learn." His neck swelled with sudden undiplomatic fury, he smacked a large hand on the table and said, loudly, "And they are going to learn it!"

"Yes, sir," agreed Harrison, becoming more uneasy and wanting

out. "May I go now and attend to my bicycle?"

"Get out of my sight!" shouted the ambassador. He made a couple of meaningless gestures, turned a florid face on Captain Grayder. "Bicycle! Does anyone on this vessel own a slingshot?"

"I doubt it, your excellency, but I will make inquiries, if you wish."

"Don't be an imbecile," ordered His Excellency. "We have our full quota of hollow-heads already."

Postponed until early morning, the next conference was relatively short and sweet. His Excellency took a seat, harumphed, straightened his best, frowned around the table.

"Let's have another look at what we've got. We know that this planet's mules call themselves Gands, don't take much interest in their Terran origin and insist on referring to us as Antigands. That implies an education and resultant outlook inimical to ourselves. They've been trained from childhood to take it for granted that whenever we appeared upon the scene we would prove to be against whatever they are for."

"And we haven't the remotest notion of what they're for," put in Colonel Shelton, quite unnecessarily. But it served to show that he was among those present and paying attention.

"I am grimly aware of our ignorance in that respect," indorsed the ambassador. "They are maintaining a conspiracy of silence about their prime motivation. We've got to break it somehow." He cleared his throat, continued, "They have a peculiar nonmonetary economic system which, in my opinion, manages to function only because of large surpluses. It won't stand a day when overpopulation brings serious shortages. This economic setup appears to be based on co-operative techniques, private enterprise, a kindergarten's honor system and plain unadorned gimme. That makes it a good deal crazier than that food-in-the-bank wackidoo they've got on the four outer planets of the Epsilon system."

"But it works," observed Grayder, pointedly.

"After a fashion. That flap-eared engineer's bicycle works—and so does he! A motorized job would save him a lot of sweat." Pleased with this analogy, the ambassador mused it a few seconds. "This local scheme of economics—if you can call it a scheme—almost certainly is the end result of the haphazard development of some hick eccentricity brought in by the original settlers. It is overdue for motorizing, so to speak. They know it but don't want it because mentally they're three hundred years behind the times. They're afraid of change, improvement, efficiency—like most backward peoples. Moreover, some of them have a vested interest in keeping things as they are." He sniffed loudly to express his contempt. "They are antagonistic toward us simply because they don't want to be disturbed."

His authoritative stare went round the table, daring one of them to remark that this might be as good a reason as any. They were too disciplined to fall into that trap. None offered comment, so he went on.

"In due time, after we've got a grip on affairs, we are going to have a long and tedious task on our hands. We'll have to overhaul their entire educational system with a view to eliminating anti-Terran prejudices and bringing them up to date on the facts of life. We've had to do that on several other planets, though not to anything like the same extent as will be necessary here."

"We'll cope," promised someone.

Ignoring him, the ambassador finished, "However, all of that is in the future. We've a problem to solve in the present. It's in our laps right now, namely, where are the reins of power and who's holding them? We've got to solve that before we can make progress. How're we going to do it?" He leaned back in his chair, added, "Get your wits working and let me have some bright suggestions."

Captain Grayder stood up, a big, leather-bound book in his hands. "Your excellency, I don't think we need exercise our minds over new plans for making contact and gaining essential information. It looks as if the next move is going to be imposed upon us."

"How do you mean?"

"There are a good many old-timers in my crew. Space lawyers, every one of them." He tapped the book. "They know official Space Regulations as well as I do. Sometimes I think they know too much."

"And so—?"

Grayder opened the book. "Regulation 127 says that on a hostile world a crew serves on a war-footing until back in space. On a nonhostile world, they serve on a peace-footing."

"What of it?"

"Regulation 131A says that on a peace-footing, the crew—with the exception of a minimum number required to keep the vessel's essential services in trim—is entitled to land-leave immediately after unloading of cargo or within seventy-two Earth hours of arrival, whichever period is the shorter." He glanced up. "By midday the men will be all set for land-leave and itching to go. There will be ructions if they don't get it."

"Will there now?" said the ambassador, smiling lopsidedly. "What if I say this world is hostile? That'll pin their ears back, won't it?"

Impassively consulting his book, Grayder came back with, "Regulation 148 says that a hostile world is defined as any planet that systematically opposes Empire citizens by force." He turned the next page. "For the purpose of these regulations, force is defined as any course of action calculated to inflict physical injury, whether or not said action succeeds in its intent."

"I don't agree." The ambassador registered a deep frown. "A world can be psychologically hostile with-

out resorting to force. We've an example right here. It isn't a friendly world."

"There are no friendly worlds within the meaning of Space Regulations," Grayder informed. "Every planet falls into one of two classifications: hostile or nonhostile." He tapped the hard leather cover. "It's all in the book."

"We would be prize fools to let a mere book boss us around or allow the crew to boss us, either. Throw it out of the port. Stick it into the disintegrator. Get rid of it any way you like—and forget it."

"Begging your pardon, your excellency, but I can't do that." Grayder opened the tome at the beginning. "Basic regulations 1A, 1B and 1C include the following: whether in space or on land, a vessel's personnel remain under direct command of its captain or his nominee who will be guided entirely by Space Regulations and will be responsible only to the Space Committee situated upon Terra. The same applies to all troops, officials and civilian passengers aboard a space-traversing vessel, whether in flight or grounded—regardless of rank or authority they are subordinate to the captain or his nominee. A nominee is defined as a ship's officer performing the duties of an immediate superior when the latter is incapacitated or absent."

"All that means you are king of your castle," said the ambassador, none too pleased. "If we don't like it, we must get off the ship."

"With the greatest respect to yourself, I must agree that that is the position. I cannot help it—regulations are regulations. And the men know it!" Grayder dumped the book, poked it away from him. "Ten to one the men will wait to midday, pressing their pants, creaming their hair and so forth. They will then make approach to me in proper manner to which I cannot object. They will request the first mate to submit their leave-roster for my approval." He gave a deep sigh. "The worst I could do would be to quibble about certain names on the roster and switch a few men around—but I couldn't refuse leave to a full quota."

"Liberty to paint the town red might be a good thing after all," suggested Colonel Shelton, not averse to doing some painting himself. "A dump like this wakes up when the fleet's in port. We ought to get contacts by the dozens. That's what we want, isn't it?"

"We want to pin down this planet's leaders," the ambassador pointed out. "I can't see them powdering their faces, putting on their best hats and rushing out to invite the yoohoo from a bunch of hungry sailors." His plump features quirked. "We have got to find the needles in this haystack. That job won't be done by a gang of ratings on the rampage."

Grayder put in, "I'm inclined to agree with you, your excellency, but we'll have to take a chance on it. If the men want to go out, the circumstances deprive me of power to pre-

vent them. Only one thing can give me the power."

"And what is that?"

"Evidence enabling me to define this world as hostile within the meaning of Space Regulations."

"Well, can't we arrange that somehow?" Without waiting for a reply, the ambassador continued, "Every crew has its incurable trouble-maker. Find yours, give him a double shot of Venusian cognac, tell him he's being granted immediate leave—but you doubt whether he'll enjoy it because these Gands view us as reasons why people dig up the drains. Then push him out of the lock. When he comes back with a black eye and a boastful story about the other fellow's condition, declare this world hostile." He waved an expressive hand. "And there you are. Physical violence. All according to the book."

"Regulation 148A, emphasizing that opposition by force must be systematic, warns that individual brawls may not be construed as evidence of hostility."

The ambassador turned an irate face upon the senior civil servant: "When you get back to Terra—if ever you do get back—you can tell the appropriate department how the space service is balled up, hamstrung, semiparalyzed and generally handicapped by bureaucrats who write books."

Before the other could think up a reply complimentary to his kind without contradicting the ambassador, a knock came at the door. First Mate Morgan entered, saluted smartly, offered Captain Grayder a sheet of paper.

"First liberty roll, sir. Do you approve it?"

Four hundred twenty men hit the town in the early afternoon. They advanced upon it in the usual manner of men overdue for the bright lights, that is to say, eagerly, expectantly, in buddy-bunches of two, three, six or ten.

Gleed attached himself to Harrison. They were two odd rankers, Gleed being the only sergeant on leave, Harrison the only tenth engineer. They were also the only two fish out of water since both were in civilian clothes and Gleed missed his uniform while Harrison felt naked without his bicycle. These trifling features gave them enough in common to justify at least one day's companionship.

"This one's a honey," declared Gleed with immense enthusiasm. "I've been on a good many liberty jaunts in my time but this one's a honey. On all other trips the boys ran up against the same problem—what to use for money. They had to go forth like a battalion of Santa Clauses, loaded up with anything that might serve for barter. Almost always nine-tenths of it wasn't of any use and had to be carted back again."

"On Persephone," informed Harrison, "a long-shanked Milik offered me a twenty-karat, blue-tinted first-water diamond for my bike."

"Jeepers, didn't you take it?"

"What was the good? I'd have had to go back sixteen light-years for another one."

"You could do without a bike for a bit."

"I can do without a diamond. I can't ride around on a diamond."

"Neither can you sell a bicycle for the price of a sportster Moon-boat."

"Yes I can. I just told you this Milik offered me a rock like an egg."

"It's a crying shame. You'd have got two hundred to two fifty thousand credits for that blinder, if it was flawless." Sergeant Gleed smacked his lips at the thought of so much moola stacked on the head of a barrel. "Credits and plenty of them—that's what I love. And that's what makes this trip a honey. Every other time we've gone out, Grayder has first lectured us about creating a favorable impression, behaving in a spacemanlike manner, and so forth. This time, he talks about credits."

"The ambassador put him up to that."

"I liked it, all the same," said Gleed. "Ten credits, a bottle of cognac and double liberty for every man who brings back to the ship an adult Gand, male or female, who is sociable and willing to talk."

"It won't be easily earned."

"One hundred credits to whoever gets the name and address of the town's chief civic dignitary. A thousand credits for the name and accurate location of the world's capitol city." He whistled happily, added, "Somebody's going to be in the dough and it won't be Bidworthy. He didn't come out of the hat. I know—I was holding it."

He ceased talking, turned to watch a tall, lithe blonde striding past. Harrison pulled at his arm.

"Here's Baines' place that I told you about. Let's go in."

"Oh, all right." Gleed followed with much reluctance, his gaze still down the street.

"Good afternoon," said Harrison, brightly.

"It ain't," contradicted Jeff Baines. "Trade's bad. There's a semifinal being played and it's taken half the town away. They'll think about their bellies after I've closed. Probably make a rush on me tomorrow and I won't be able to serve them fast enough."

"How can trade be bad if you don't take money even when it's good?" inquired Gleed, reasonably applying what information Harrison had given him.

Jeff's big moon eyes went over him slowly, then turned to Harrison. "So he's another bum off your boat. What's he talking about?"

"Money," said Harrison. "It's stuff we use to simplify trade. It's printed stuff, like documentary obs of various sizes."

"That tells me a lot," Jeff Baines observed. "It tells me a crowd that has to make a printed record of every ob isn't to be trusted—because they don't even trust each other." Waddling to his high stool, he squatted on it. His breathing was

labored and wheezy. "And that confirms what our schools have always taught—that an Antigand would swindle his widowed mother."

"Your schools have got it wrong," assured Harrison.

"Maybe they have." Jeff saw no need to argue the point. "But we'll play safe until we know different." He looked them over. "What do you two want, anyway?"

"Some advice," shoved in Gleed, quickly. "We're out on the spree. Where's the best places to go for food and fun?"

"How long you got?"

"Until night fall tomorrow."

"No use." Jeff Baines shook his head sorrowfully. "It'd take you from now to then to plant enough obs to qualify for what's going. Besides, lots of folk wouldn't let any Antigand dump an ob on them. They're kind of particular, see?"

"Look," said Harrison. "Can't we get so much as a square meal?"

"Well, I dunno about that." Jeff thought it over, rubbing several chins. "You might manage so much—but I can't help you this time. There's nothing I want of you, so you can't use any obs I've got planted."

"Can you make any suggestions?"

"If you were local citizens, it'd be different. You could get all you want right now by taking on a load of obs to be killed sometime in the future as and when the chances come along. But I can't see anyone giving credit to Antigands who are here today and gone tomorrow."

"Not so much of the gone tomorrow talk," advised Gleed. "When an Imperial Ambassador is sent it means that Terrans will be here for keeps."

"Who says so?"

"The Empire says so. You're part of it, aren't you?"

"Nope," said Jeff. "We aren't part of anything and don't want to be, either. What's more, nobody's going to make us part of anything."

Gleed leaned on the counter and gazed absently at a large can of pork. "Seeing I'm out of uniform and not on parade, I sympathize with you though I still shouldn't say it. I wouldn't care to be taken over body and soul by other-world bureaucrats, myself. But you folk are going to have a tough time beating us off. That's the way it is."

"Not with what we've got," Jeff opined. He seemed mighty self-confident.

"You ain't got so much," scoffed Gleed, more in friendly criticism than open contempt. He turned to Harrison. "Have they?"

"It wouldn't appear so," ventured Harrison.

"Don't go by appearances," Jeff advised. "We've more than you'd care to guess at."

"Such as what?"

"Well, just for a start, we've got the mightiest weapon ever thought up by mind of man. We're Gands, see? So we don't need ships and guns and suchlike playthings. We've got something better. It's effective.

There's no defense against it."

"I'd like to see it," Gleed challenged. Data on a new and exceptionally powerful weapon should be a good deal more valuable than the mayor's address. Grayder might be sufficiently overcome by the importance thereof to increase the take to five thousand credits. With a touch of sarcasm, he added, "But, of course, I can't expect you to give away secrets."

"There's nothing secret about it," said Jeff, very surprisingly. "You can have it for free any time you want. Any Gand would give it you for the asking. Like to know why?"

"You bet."

"Because it works one way only. We can use it against you—but you can't use it against us."

"There's no such thing. There's no weapon inventable which the other guy can't employ once he gets his hands on it and knows how to operate it."

"You sure?"

"Positive," said Gleed, with no hesitation whatever. "I've been in the space-service troops for twenty years and you can't fiddle around that long without learning all about weapons from string bows to H-bombs. You're trying to kid me—and it won't work. A one-way weapon is impossible."

"Don't argue with him," Harrison suggested to Baines. "He'll never be convinced until he's shown."

"I can see that." Jeff Baines' face creased in a slow grin. "I told you that you could have our wonder-weapon for the asking. Why don't you ask?"

"All right, I'm asking." Gleed put it without much enthusiasm. A weapon that would be presented on request, without even the necessity of first planting a minor ob, couldn't be so mighty after all. His imaginary five thousand credits shrank to five, thence to none. "Hand it over and let me try it."

Swiveling heavily on his stool, Jeff reached to the wall, removed a small, shiny plaque from its hook, passed it across the counter.

"You may keep it," he informed. "And much good may it do you."

Gleed examined it, turning it over and over between his fingers. It was nothing more than an oblong strip of substance resembling ivory. One side was polished and bare. The other bore three letters deeply engraved in bold style:

F—I. W.

Glancing up, his features puzzled, he said, "Call this a weapon?"

"Certainly."

"Then I don't get it." He passed the plaque to Harrison. "Do you?"

"No." Harrison had a good look at it, spoke to Baines. "What does this F—I.W. mean?"

"Initial-slang," informed Baines. "Made correct by common usage. It has become a world-wide motto. You'll see it all over the place, if you haven't noticed it already."

"I have spotted it here and there but attached no importance to it and thought nothing of it. I remember

now I've seen it inscribed in several places, including Seth's and the fire depot."

"It was on the sides of that bus we couldn't empty," added Gleed. "Didn't mean anything to me."

"It means plenty," said Jeff. *"Freedom—I Won't!"*

"That kills me," Gleed told him. "I'm stone dead already. I've dropped in my tracks." He watched Harrison thoughtfully pocketing the plaque. "A bit of abracadabra. What a weapon!"

"Ignorance is bliss," remarked Baines, strangely certain of himself. "Especially when you don't know that what you're playing with is the safety catch of something that goes bang."

"All right," challenged Gleed, taking him up on that. "Tell us how it works."

"I won't." The grin reappeared. Baines seemed highly satisfied about something.

"That's a fat lot of help." Gleed felt let down, especially over those momentarily hoped-for credits. "You boast about a one-way weapon, toss across a slip of stuff with three letters on it and then go dumb. Any guy can talk out the back of his neck. How about backing up your talk?"

"I won't," said Baines, his grin becoming broader than ever. He favored the onlooking Harrison with a fat, significant wink.

It made something spark vividly inside Harrison's mind. His jaw dropped, he took the plaque from his pocket, stared at it as if seeing it for the first time.

"Give it me back," requested Baines, watching him.

Replacing it in his pocket, Harrison said very firmly, "I won't."

Baines chuckled. "Some folk catch on quicker than others."

Resenting that remark, Gleed held his hand out to Harrison. "Let's have another look at that thing."

"I won't," said Harrison, meeting him eye for eye.

"Hey, that's not the way—" Gleed's protesting voice died out. He stood there a moment, his optics slightly glassy while his brain performed several loops. Then, in hushed tones, he said, "Good grief!"

"Precisely," approved Baines. "Grief, and plenty of it. You were a bit slow on the uptake."

Overcome by the flood of insubordinate ideas now pouring upon him, Gleed said hoarsely to Harrison, "Come on, let's get out of here. I gotta think. I gotta think some place quiet."

There was a tiny park with seats and lawns and flowers and a little fountain around which a small bunch of children were playing. Choosing a place facing a colorful carpet of exotic un-Terran blooms, they sat and brooded a while.

In due course, Gleed commented, "For one solitary guy it would be martyrdom, but for a whole world—" His voice drifted off, came back. "I've been taking this about as far as I can make it go and the results

give me the leaping fantods."

Harrison said nothing.

"F'rinstance," Gleed continued, "supposing when I go back to the ship that snorting rhinoceros Bidworthy gives me an order. I give him the frozen wolliker and say, 'I won't!' He either drops dead or throws me in the clink."

"That would do you a lot of good."

"Wait a bit—I ain't finished. I'm in the clink, but the job still needs doing. So Bidworthy picks on someone else. The victim, being a soulmate of mine, also donates the icy optic and says, 'I won't!' In the clink he goes and I've got company. Bidworthy tries again. And again. There's more of us warming the jug. It'll only hold twenty. So they take over the engineer's mess."

"Leave our mess out of this," Harrison requested.

"They take the mess," Gleed insisted, thoroughly determined to penalize the engineers. "Pretty soon it's crammed to the roof with I-won'ters. Bidworthy's still raking 'em in as fast as he can go—if by that time he hasn't burst a dozen blood vessels. So they take over the Blieder dormitories."

"Why keep picking on my crowd?"

"And pile them with bodies ceiling-high," Gleed said, getting sadistic pleasure out of the notion. "Until in the end Bidworthy has to get buckets and brushes and go down on his knees and do his own deck-scrubbing while Grayder, Shelton and the rest act as clink guards. By that time, His Loftiness the ambassador is in the galley busily cooking for you and me, assisted by a disconcerted bunch of yes-ing pen-pushers." He had another somewhat awed look at the picture and finished, "Holy smoke!"

A colored ball rolled his way, he stooped, picked it up and held on to it. Promptly a boy of about seven ran up, eyed him gravely.

"Give me my ball, please."

"I won't," said Gleed, his fingers firmly around it.

There was no protest, no anger, no tears. The child merely registered disappointment, turned to go away.

"Here you are, sonny." He tossed the ball.

"Thanks." Grabbing it, the other ran off.

Harrison said, "What if every living being in the Empire, all the way from Prometheus to Kaldor Four, across eighteen hundred light-years of space, gets an income-tax demand, tears it up and says, 'I won't!'? What happens then?"

"We'd need a second universe for a pen and a third one to provide the guards."

"There would be chaos," Harrison went on. He nodded toward the fountain and the children playing around it. "But it doesn't look like chaos here. Not to my eyes. So that means they don't overdo this blank refusal business. They apply it judiciously on some mutally recognized basis. What that basis might be beats me completely."

"Me, too."

An elderly man stopped near them, surveyed them hesitantly, decided to pick on a passing youth.

"Can you tell me where I can find the roller for Martinstown?"

"Other end of Eighth," informed the youth. "One every hour. They'll fix your manacles before they start."

"Manacles?" The oldster raised white eyebrows. "Whatever for?"

"That route runs past the spaceship. The Antigands may try to drag you out."

"Oh, yes, of course." He ambled on, glanced again at Gleed and Harrison, remarked in passing, "These Antigands—such a nuisance."

"Definitely," indorsed Gleed. "We keep telling them to get out and they keep on saying, 'We won't.' "

The old gentleman missed a step, recovered, gave him a peculiar look, continued on his way.

"One or two seem to cotton on to our accents," Harrison remarked. "Though nobody noticed mine when I was having that feed in Seth's."

Gleed perked up with sudden interest. "Where you've had one feed you can get another. C'mon, let's try. What have we got to lose?"

"Our patience," said Harrison. He stood up. "We'll pick on Seth. If he won't play, we'll have a try at someone else. And if nobody will play, we'll skin out fast before we starve to death."

"Which appears to be exactly what they want us to do," Gleed pointed out. He scowled to himself. "They'll get their way over my dead body."

"That's how," agreed Harrison. "Over your dead body."

Matt came up with a cloth over one arm. "I'm serving no Antigands."

"You served me last time," Harrison told him.

"That's as maybe. I didn't know you were off that ship. But I know now!" He flicked the cloth across one corner of the table. "No Antigands served by me."

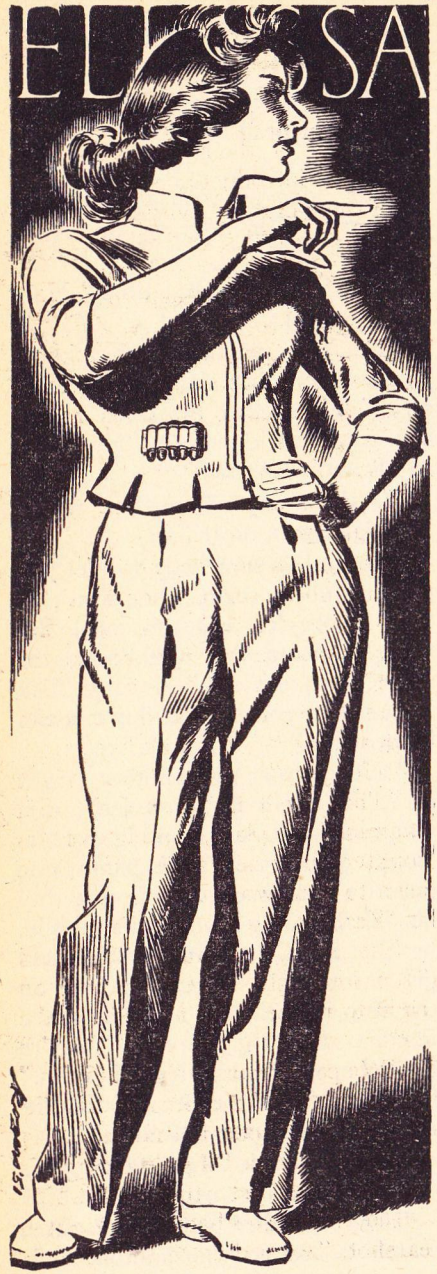
"Is there any other place where we might get a meal?"

"Not unless somebody will let you plant an ob on them. They won't do that if they're wise to you, but there's a chance they might make the same mistake I did." Another flick across the corner. "I don't make them twice."

"You're making another right now," said Gleed, his voice tough and authoritative. He nudged Harrison. "Watch this!" His hand came out of a side pocket holding a tiny blaster. Pointing it at Matt's middle, he continued, "Ordinarily, I could get into trouble for this, if those on the ship were in the mood to make trouble. But they aren't. They're soured up on you two-legged mules." He motioned the weapon. "Get walking and bring us two full plates."

"I won't," said Matt, firming his jaw and ignoring the gun.

Gleed thumbed the safety catch which moved with an audible click.



"It's touchy now. It'd go off at a sneeze. Start moving."

"I won't," insisted Matt.

Gleed disgustedly shoved the weapon back into his pocket. "I was only kidding you. It isn't energized."

"Wouldn't have made the slightest difference if it had been," Matt assured. "I serve no Antigands, and that's that!"

"Suppose I'd gone haywire and blown you in half?"

"How could I have served you then?" he inquired. "A dead person is of no use to anyone. Time you Antigands learned a little logic."

With that parting shot he went away.

"He's got something there," observed Harrison, patently depressed. "What can you do with a waxie one? Nothing whatever! You'd have put him clean out of your own power."

"Don't know so much. A couple of stiffs lying around might sharpen the others. They'd get really eager."

"You're thinking of them in Terran terms," Harrison said. "It's a mistake. They're not Terrans, no matter where they came from originally. They're Gands." He mused a moment. "I've no notion of just what Gands are supposed to be but I reckon they're some kind of fanatics. Terra exported one-track-minders by the millions around the time of the Great Explosion. Look at that crazy crowd they've got on Hygeia."

"I was there once and I tried hard not to look," confessed Gleed, reminiscently. "Then I couldn't stop looking. Not so much as a fig leaf be-

tween the lot. They insisted that we were obscene because we wore clothes. So eventually we had to take them off. Know what I was wearing at the time we left?"

"A dignified poise," Harrison suggested.

"That and an identity disk, cuprosilver, official issue, spacemen, for the use of," Gleed informed. "Plus three wipes of grease-paint on my left arm to show I was a sergeant. I looked every inch a sergeant—like heck I did!"

"I know. I had a week in that place."

"We'd a rear admiral on board," Gleed went on. "As a fine physical specimen he resembled a pair of badly worn suspenders. He couldn't overawe anyone while in his birthday suit. Those Hygeians cited his deflation as proof that they'd got real democracy, as distinct from our fake version." He clucked his tongue. "I'm not so sure they're wrong."

"The creation of the Empire has created a queer proposition," Harrison meditated. "Namely, that Terra is always right while sixteen hundred and forty-two planets are invariably wrong."

"You're getting kind of seditious, aren't you?"

Harrison said nothing. Gleed glanced at him, found his attention elsewhere, followed his gaze to a brunette who had just entered.

"Nice," approved Gleed. "Not too young, not too old. Not too fat, not too thin. Just right."

"I know her." Harrison waved to attract her attention.

She tripped lightly across the room, sat at their table. Harrison made the introduction.

"Friend of mine. Sergeant Gleed."

"Arthur," corrected Gleed, eating her.

"Mine's Elissa," she told him. "What's a sergeant supposed to be?"

"A sort of over-above underthing," Gleed informed. "I pass along the telling to the guys who do the doing."

Her eyes widened. "Do you mean that people really allow themselves to be told?"

"Of course. Why not?"

"It sounds crazy to me." Her gaze shifted to Harrison. "I'll be ignorant of *your* name forever, I suppose?"

He hastened to repair the omission, adding, "But I don't like James. I prefer Jim."

"Then we'll let it be Jim." She examined the place, looking over the counter, the other tables. "Has Matt been to you two?"

"Yes. He refuses to serve us."

She shrugged warm shoulders. "It's his right. Everyone has the right to refuse. That's freedom, isn't it?"

"We call it mutiny," said Gleed.

"Don't be so childish," she reproved. She stood up, moved away. "You wait here. I'll go see Seth."

"I don't get this," admitted Gleed, when she had passed out of earshot. "According to that fat fella

in the delicatessen, their technique is to give us the cold shoulder until we run away in a huff. But this dame acts friendly. She's . . . she's—" He stopped while he sought for a suitable word, found it and said, "She's un-Gandian."

"Not so," Harrison contradicted. "They've the right to say, 'I won't.' She's practising it."

"By gosh, yes! I hadn't thought of that. They can work it any way they like, and please themselves."

"Sure." He dropped his voice. "Here she comes."

Resuming her seat, she primped her hair, said, "Seth will serve us personally."

"Another traitor," remarked Gleed with a grin.

"On one condition," she went on. "You two must wait and have a talk with him before you leave."

"Cheap at the price," Harrison decided. A thought struck him and he asked, "Does this mean you'll have to kill several obs for all three of us?"

"Only one for myself."

"How come?"

"Seth's got ideas of his own. He doesn't feel happy about Antigands any more than does anyone else."

"And so?"

"But he's got the missionary instinct. He doesn't agree entirely with the idea of giving all Antigands the ghost-treatment. He thinks it should be reserved only for those too stubborn or stupid to be converted." She smiled at Gleed, making his top hairs quiver. "Seth thinks that any intelligent Antigand is a would-be Gand."

"What is a Gand, anyway?" asked Harrison.

"An inhabitant of this world, of course."

"I mean, where did they dig up the name?"

"From Gandhi," she said.

Harrison frowned in puzzlement. "Who the deuce was he?"

"An ancient Terran. The one who invented The Weapon."

"Never heard of him."

"That doesn't surprise me," she remarked.

"Doesn't it?" He felt a little irritated. "Let me tell you that these days we Terrans get as good an education as—"

"Calm down, Jim." She made it more soothing by pronouncing it "Jeem." "All I mean is that ten to one he's been blanked out of your history books. He might have given you unwanted ideas, see? You couldn't be expected to know what you've been deprived of the chance to learn."

"If you mean that Terran history is censored, I don't believe it," he asserted.

"It's your right to refuse to believe. That's freedom, isn't it?"

"Up to a point. A man has duties. He's no right to refuse those."

"No?" She raised tantalizing eyebrows, delicately curved. "Who defines those duties—himself, or somebody else?"

"His superiors, most times."

"No man is superior to another. No man has the right to define an-

other man's duties." She paused, eying him speculatively. "If anyone on Terra exercises such idiotic power, it is only because idiots permit him. They fear freedom. They prefer to be told. They like being ordered around. What men!"

"I shouldn't listen to you," protested Gleed, chipping in. His leathery face was flushed. "You're as naughty as you're pretty."

"Afraid of your own thoughts?" she jibed, pointedly ignoring his compliment.

He went redder. "Not on your life. But I—" His voice tailed off as Seth arrived with three loaded plates and dumped them on the table.

"See you afterward," reminded Seth. He was medium-sized, with thin features and sharp, quick-moving eyes. "Got something to say to you."

Seth joined them shortly after the end of the meal. Taking a chair, he wiped condensed steam off his face, looked them over.

"How much do you two know?"

"Enough to argue about it," put in Elissa. "They are bothered about duties, who defines them, and who does them."

"With good reason," Harrison riposted. "You can't escape them yourselves."

"Meaning—?" asked Seth.

"This world runs on some strange system of swapping obligations. How will any person kill an ob unless he recognizes his duty to do so?"

"Duty has nothing to do with it," said Seth. "And if it did happen to be a matter of duty, every man would recognize it for himself. It would be outrageous impertinence for anyone else to remind him, unthinkable to anyone to order him."

"Some guys must make an easy living," interjected Gleed. "There's nothing to stop them that I can see." He studied Seth briefly before he continued, "How can you cope with a citizen who has no conscience?"

"Easy as pie."

Elissa suggested, "Tell them the story of Idle Jack."

"It's a kid's yarn," explained Seth. "All children here know it by heart. It's a classic fable like . . . like—" He screwed up his face. "I've lost track of the Terran tales the first comers brought with them."

"Red Riding Hood," offered Harrison.

"Yes." Seth seized on it gratefully. "Something like that one. A nursery story." He licked his lips, began, "This Idle Jack came from Terra as a baby, grew up in our new world, studied our economic system and thought he'd be mighty smart. He decided to become a scratcher."

"What's a scratcher?" inquired Gleed.

"One who lives by taking obs and does nothing about killing them or planting any of his own. One who accepts everything that's going and gives nothing in return."

"I get it. I've known one or two like that in my time."

"Up to age sixteen, Jack got away

with it. He was a kid, see. All kids tend to scratch to a certain extent. We expect it and allow for it. After sixteen, he was soon in the soup."

"How?" urged Harrison, more interested than he was willing to show.

"He went around the town gathering obs by the armful. Meals, clothes and all sorts for the mere asking. It's not a big town. There are no big ones on this planet. They're just small enough for everyone to know everyone—and everyone does plenty of gabbing. Within three or four months the entire town knew Jack was a determined scratcher."

"Go on," said Harrison, getting impatient.

"Everything dried up," said Seth. "Wherever Jack went, people gave him the 'I won't.' That's freedom, isn't it? He got no meals, no clothes, no entertainment, no company, nothing! Soon he became terribly hungry, busted into someone's larder one night, gave himself the first square meal in a week."

"What did they do about that?"

"Nothing. Not a thing."

"That would encourage him some, wouldn't it?"

"How could it?" Seth asked, with a thin smile. "It did him no good. Next day his belly was empty again. He had to repeat the performance. And the next day. And the next. People became leery, locked up their stuff, kept watch on it. It became harder and harder. It became so unbearably hard that it was soon a lot easier to leave the town and try another. So Idle Jack went away."

"To do the same again," Harrison suggested.

"With the same results for the same reasons," retorted Seth. "On he went to a third town, a fourth, a fifth, a twentieth. He was stubborn enough to be witless."

"He was getting by," Harrison observed. "Taking all at the mere cost of moving around."

"No he wasn't. Our towns are small, like I said. And folk do plenty of visiting from one to another. In town number two Jack had to risk being seen and talked about by someone from town number one. As he went on it got a whole lot worse. In the twentieth he had to take a chance on gabby visitors from any of the previous nineteen." Seth leaned forward, said with emphasis, "He never got to town number twenty-eight."

"No?"

"He lasted two weeks in number twenty-five, eight days in twenty-six, one day in twenty-seven. That was almost the end."

"What did he do then?"

"Took to the open country, tried to live on roots and wild berries. Then he disappeared—until one day some walkers found him swinging from a tree. The body was emaciated and clad in rags. Loneliness and self-neglect had killed him. That was Idle Jack, the scratcher. He wasn't twenty years old."

"On Terra," informed Gleed, "we

don't hang people merely for being lazy."

"Neither do we," said Seth. "We leave them free to go hang themselves." He eyed them shrewdly, went on, "But don't let it worry you. Nobody has been driven to such drastic measures in my lifetime, leastways, not that I've heard about. People honor their obs as a matter of economic necessity and not from any sense of duty. Nobody gives orders, nobody pushes anyone around, but there's a kind of compulsion built into the circumstances of this planet's way of living. People play square—or they suffer. Nobody enjoys suffering—not even a numbskull."

"Yes, I suppose you're right," put in Harrison, much exercised in mind.

"You bet I'm dead right!" Seth assured. "But what I wanted to talk to you two about is something more important. It's this: What's your real ambition in life?"

Without hesitation, Gleed said, "To ride the spaceways while remaining in one piece."

"Same here," Harrison contributed.

"I guessed that much. You'd not be in the space service if it wasn't your choice. But you can't remain in it forever. All good things come to an end. What then?"

Harrison fidgeted uneasily. "I don't care to think of it."

"Some day, you'll have to," Seth pointed out. "How much longer have you got?"

"Four and a half Earth years."

Seth's gaze turned to Gleed.

"Three Earth years."

"Not long," Seth commented. "I didn't expect you would have much time left. It's a safe bet that any ship penetrating this deeply into space has a crew composed mostly of old-timers getting near the end of their terms. The practiced hands get picked for the awkward jobs. By the day your boat lands again on Terra it will be the end of the trail for many of them, won't it?"

"It will for me," Gleed admitted, none too happy at the thought.

"Time—the older you get the faster it goes. Yet when you leave the service you'll still be comparatively young." He registered a faint, taunting smile. "I suppose you'll then obtain a private space vessel and continue roaming the cosmos on your own?"

"Impossible," declared Gleed. "The best a rich man can afford is a Moon-boat. Puttering to and fro between a satellite and its primary is no fun when you're used to Bliederzips across the galaxy. The smallest space-going craft is far beyond reach of the wealthiest. Only governments can afford them."

"By 'governments' you mean communities?"

"In a way."

"Well, then, what are you going to do when your space-roving days are over?"

"I'm not like Big Ears here."

Gleed jerked an indicative thumb at Harrison. "I'm a trooper and not a technician. So my choice is limited by lack of qualifications." He rubbed his chin, looked wistful. "I was born and brought up on a farm. I still know a good deal about farming. So I'd like to get a small one of my own and settle down."

"Think you'll manage it?" asked Seth, watching him.

"On Falder or Hygeia or Norton's Pink Heaven or some other undeveloped planet. But not on Terra. My savings won't extend to that. I don't get half enough to meet Earth costs."

"Meaning you can't pile up enough obs?"

"I can't," agreed Gleed, lugubriously. "Not even if I saved until I'd got a white beard four feet long."

"So there's Terra's reward for a long spell of faithful service—forego your heart's desire or get out?"

"Shut up!"

"I won't," said Seth. He leaned nearer. "Why do you think two hundred thousand Gands came to this world, Doukhobors to Hygeia, Quakers to Centauri B., and all the others to their selected haunts? Because Terra's reward for good citizenship was the peremptory order to knuckle down or get out. So we got out."

"It was just as well, anyway," Elissa interjected. "According to our history books, Terra was badly overcrowded. We went away and relieved the pressure."

"That's beside the point," reproved Seth. He continued with Gleed. "You want a farm. It can't be on Terra much as you'd like it there. Terra says, 'No! Get out!' So it's got to be some place else." He waited for that to sink in, then, "Here, you can have one for the mere taking." He snapped his fingers. "Like that!"

"You can't kid me," said Gleed, wearing the expression of one eager to be kidded. "Where are the hidden strings?"

"On this planet, any plot of ground belongs to the person in possession, the one who is making use of it. Nobody disputes his claim so long as he continues to use it. All you need do is look around for a suitable piece of unused territory—of which there is plenty — and start using it. From that moment it's yours. Immediately you cease using it and walk out, it's anyone else's, for the taking."

"Zipping meteors!" Gleed was incredulous.

"Moreover, if you look around long enough and strike really lucky," Seth continued, "you might stake first claim to a farm someone else has abandoned because of death, illness, a desire to move elsewhere, a chance at something else he liked better, or any other excellent reason. In that case, you would walk into ground already part-prepared, with farmhouse, milking shed, barns and the rest. And it would be yours, all yours."

"What would I owe the previous

occupant?" asked Gleed.

"Nothing. Not an ob. Why should you? If he isn't buried, he has got out for the sake of something else equally free. He can't have the benefit both ways, coming and going."

"It doesn't make sense to me. Somewhere there's a snag. Somewhere I've got to pour out hard cash or pile up obs."

"Of course you have. You start a farm. A handful of local folk help you build a house. They dump heavy obs on you. The carpenter wants farm produce for his family for the next couple of years. You give it, thus killing that ob. You continue giving it for a couple of extra years, thus planting an ob on *him*. First time you want fences mending, or some other suitable task doing, along he comes to kill *that* ob. And so with all the rest, including the people who supply your raw materials, your seeds and machinery, or do your trucking for you."

"They won't all want milk and potatoes," Gleed pointed out.

"Don't know what you mean by potatoes. Never heard of them."

"How can I square up with someone who may be getting all the farm produce he wants from elsewhere?"

"Easy," said Seth. "A tinsmith supplies you with several churns. He doesn't want food. He's getting all he needs from another source. His wife and three daughters are overweight and dieting. The mere thought of a load from your farm gives them the horrors."

"Well?"

"But this tinsmith's tailor, or his cobbler, have got obs on him which he hasn't had the chance to kill. So he transfers them to you. As soon as you're able, you give the tailor or cobbler what they need to satisfy the obs, thus doing the tinsmith's killing along with your own." He gave his usual half-smile, added, "And everyone is happy."

Gleed stewed it over, frowning while he did it. "You're tempting me. You shouldn't ought to. It's a criminal offense to try divert a spaceman from his allegiance. It's sedition. Terra is tough with sedition."

"Tough my eye!" said Seth, sniffing contemptuously. "We've Gand laws here."

"All you have to do," suggested Elissa, sweetly persuasive, "is say to yourself that you've got to go back to the ship, that it's your duty to go back, that neither the ship nor Terra can get along without you." She tucked a curl away. "Then be a free individual and say, 'I won't!' "

"They'd skin me alive. Bidworthy would preside over the operation in person."

"I don't think so," Seth offered. "This Bidworthy—whom I presume to be anything but a jovial character—stands with you and the rest of your crew at the same junction. The road before him splits two ways. He's got to take one or the other and there's no third alternative. Sooner or later he'll be hell-bent for home, eating his top lip as he goes,

or else he'll be running around in a truck delivering your milk—because, deep inside himself, that's what he's always wanted to do."

"You don't know him like I do," mourned Gleed. "He uses a lump of old iron for a soul."

"Funny," remarked Harrison, "I always thought of *you* that way—until today."

"I'm off duty," said Gleed, as though that explained everything. "I can relax and let the ego zoom around outside of business hours." He stood up, firmed his jaw. "But I'm going back on duty. Right now!"

"You're not due before sundown tomorrow," Harrison protested.

"Maybe I'm not. But I'm going back all the same."

Elissa opened her mouth, closed it as Seth nudged her. They sat in silence and watched Gleed march determinedly out.

"It's a good sign," commented Seth, strangely self-assured. "He's been handed a wallop right where he's weakest." He chuckled low down, turned to Harrison. "What's *your* ultimate ambition?"

"Thanks for the meal. It was a good one and I needed it." Harrison stood up, manifestly embarrassed. He gestured toward the door. "I'm going to catch him up. If he's returning to the ship, I think I'll do likewise."

Again Seth nudged Elissa. They said nothing as Harrison made his way out, carefully closing the door behind him.

"Sheep," decided Elissa, disappointed for no obvious reason. "One follows another. Just like sheep."

"Not so," Seth contradicted. "They're humans animated by the same thoughts, the same emotions, as were our forefathers who had nothing sheeplike about them." Twisting round in his chair, he beckoned to Matt. "Bring us two shemaks." Then to Elissa. "My guess is that it won't pay that ship to hang around too long."

The battleship's caller-system bawled imperatively, "Fanshaw, Folsom, Fuller, Garson, Gleed, Gregory, Haines, Harrison, Hope—" and down through the alphabet.

A trickle of men flowed along the passages, catwalks and alleyways toward the fore chartroom. They gathered outside it in small clusters, chattering in undertones and sending odd scraps of conversation echoing down the corridor.

"Wouldn't say anything to us but, 'Myob!' Got sick and tired of it after a while."

"You ought to have split up, like we did. That show place on the outskirts didn't know what a Terran looks like. I just walked in and took a seat."

"Hear about Meakin? He mended a leaky roof, chose a bottle of double dith in payment and mopped the lot. He was dead flat when we found him. Had to be carried back."

"Some guys have all the luck. We got the brush-off wherever we showed our faces. It gets you down."

"You should have separated, like

I said."

"Half the mess must be still lying in the gutter. They haven't turned up yet."

"Grayder will be hopping mad. He'd have stopped this morning's second quota if he'd known in time."

Every now and again First Mate Morgan stuck his head out of the chartroom door and uttered a name already voiced on the caller. Frequently there was no response.

"Harrison!" he yelled.

With a puzzled expression, Harrison went inside. Captain Grayder was there, seated behind a desk and gazing moodily at a list lying before him. Colonel Shelton was stiff and erect to one side, with Major Hame slightly behind him. Both wore the pained expressions of those tolerating a bad smell while the plumber goes looking for the leak.

His Excellency was tramping steadily to and fro in front of the desk, muttering deep down in his chins. "Barely five days and already the rot has set in." He turned as Harrison entered, fired off sharply, "So it's you, mister. When did you return from leave?"

"The evening before last, sir."

"Ahead of time, eh? That's curious. Did you get a puncture or something?"

"No, sir. I didn't take my bicycle with me."

"Just as well," approved the ambassador. "If you had done so, you'd have been a thousand miles away by now and still pushing hard."

"Why, sir?"

"Why? He asks me why! That's precisely what I'd like to know—*why?*" He fumed a bit, then inquired, "Did you visit this town by yourself, or in company?"

"I went with Sergeant Gleed, sir."

"Call him," ordered the ambassador, looking at Morgan.

Opening the door, Morgan obediently shouted, "Gleed! Gleed!"

No answer.

He tried again, without result. They put it over the caller-system again. Sergeant Gleed refused to be among those present.

"Has he booked in?"

Grayder consulted his list. "In early. Twenty-four hours ahead of time. He may have sneaked out again with the second liberty quota this morning and omitted to book it. That's a double crime."

"If he's not on the ship, he's off the ship, crime or no crime."

"Yes, your excellency." Captain Grayder registered slight weariness.

"GLEED!" howled Morgan, outside the door. A moment later he poked his head inside, said, "Your excellency, one of the men says Sergeant Gleed is not on board because he saw him in town quite recently."

"Send him in." The ambassador made an impatient gesture at Harrison. "Stay where you are and keep those confounded ears from flapping. I've not finished with you yet."

A long, gangling grease-monkey came in, blinked around, a little awed by high brass.

"What do you know about Ser-

geant Gleed?" demanded the ambassador.

The other licked his lips, seemed sorry that he had mentioned the missing man. "It's like this, your honor, I—"

"Call me 'sir.'"

"Yes, sir." More disconcerted blinking. "I went out with the second party early this morning, came back a couple of hours ago because my stomach was acting up. On the way, I saw Sergeant Gleed and spoke to him."

"Where? When?"

"In town, sir. He was sitting in one of those big long-distance coaches. I thought it a bit queer."

"Get down to the roots, man! What did he tell you, if anything?"

"Not much, sir. He seemed pretty chipper about something. Mentioned a young widow struggling to look after two hundred acres. Someone had told him about her and he thought he'd take a peek." He hesitated, backed away a couple of paces, added, "He also said I'd see him in irons or never."

"One of *your* men," said the ambassador to Colonel Shelton. "A trooper, allegedly well-disciplined. One with long service, three stripes, and a pension to lose." His attention returned to the informant. "Did he say exactly where he was going?"

"No, sir. I asked him, but he just grinned and said, 'Myob!' So I came back to the ship."

"All right. You may go." His Excellency watched the other depart, then continued with Harrison. "You were with that first quota."

"Yes, sir."

"Let me tell you something, mister. Four hundred twenty men went out. Only two hundred have returned. Forty of those were in various stages of alcoholic turpitude. Ten of them are in the clink yelling, 'I won't!' in steady chorus. Doubtless they'll go on yelling until they've sobered up."

He stared at Harrison as if that worthy were personally responsible, then went on, "There's something paradoxical about this. I can understand the drunks. There are always a few individuals who blow their tops first day on land. But of the two hundred who have condescended to come back, about half returned before time, the same as you did. Their reasons were identical—the town was unfriendly, everyone treated them like ghosts until they'd had enough."

Harrison made no comment.

"So we have two diametrically opposed reactions," the ambassador complained. "One gang of men say the place stinks so much that they'd rather be back on the ship. Another gang finds it so hospitable that either they get filled to the gills on some stuff called double dith, or they stay sober and desert the service. I want an explanation. There's got to be one somewhere. You've been twice in this town. What can you tell us?"

Carefully, Harrison said, "It all depends on whether or not you're spotted as a Terran. Also on whether you meet Gands who'd

rather convert you than give you the brush-off." He pondered a moment, finished, "Uniforms are a give-away."

"You mean they're allergic to uniforms?"

"More or less, sir."

"Any idea why?"

"Couldn't say for certain, sir. I don't know enough about them yet. As a guess, I think they may have been taught to associate uniforms with the Terran regime from which their ancestors escaped."

"Escaped nothing!" scoffed the ambassador. "They grabbed the benefit of Terran inventions, Terran techniques and Terran manufacturing ability to go some place where they'd have more elbow room." He gave Harrison the sour eye. "Don't any of them wear uniforms?"

"Not that I could recognize as such. They seem to take pleasure in expressing their individual personalities by wearing anything they fancy, from pigtails to pink boots. Oddity in attire is the norm among the Gands. Uniformity is the real oddity—they think it's submissive and degrading."

"You refer to them as Gands. Where did they dig up that name?"

Harrison told him, thinking back to Elissa as she explained it. In his mind's eye he could see her now. And Seth's place with the tables set and steam rising behind the counter and mouth-watering smells oozing from the background. Now that he came to visualize the scene again, it appeared to embody an elusive but essential something that the ship had never possessed.

"And this person," he concluded, "invented what they call The Weapon."

"Hm-m-m! And they assert he was a Terran? What does he look like? Did you see a photograph or a statue?"

"They don't erect statues, sir. They say no person is more important than another."

"Bunkum!" snapped the ambassador, instinctively rejecting that viewpoint. "Did it occur to you to ask at what period in history this wonderful weapon was tried out?"

"No, sir," Harrison confessed. "I didn't think it important."

"You wouldn't. Some of you men are too slow to catch a Callistrian sloth wandering in its sleep. I don't criticize your abilities as spacemen, but as intelligence-agents you're a dead loss."

"I'm sorry, sir," said Harrison.

Sorry? You louse! whispered something deep within his own mind. *Why should you be sorry? He's only a pompous fat man who couldn't kill an ob if he tried. He's no better than you. Those raw boys prancing around on Hygeia would maintain that he's not as good as you because he's got a pot belly. Yet you keep looking at his pot belly and saying, "Sir," and, "I'm sorry." If he tried to ride your bike, he'd fall off before he'd gone ten yards. Go spit in his eye and say, "I won't." You're not scared, are you?*

"No!" announced Harrison, loud-

ly and firmly.

Captain Grayder glanced up. "If you're going to start answering questions before they've been asked, you'd better see the medic. Or have we a telepath on board?"

"I was thinking," Harrison explained.

"I approve of that," put in His Excellency. He lugged a couple of huge tomes out of the wall-shelves, began to thumb rapidly through them. "Do plenty of thinking whenever you've the chance and it will become a habit. It will get easier and easier as time rolls on. In fact, a day may come when it can be done without pain."

He shoved the books back, pulled out two more, spoke to Major Hame who happened to be at his elbow. "Don't pose there glassy-eyed like a relic propped up in a military museum. Give me a hand with this mountain of knowledge. I want Gandhi, anywhere from three hundred to a thousand Earth-years ago."

Hame came to life, started dragging out books. So did Colonel Shelton. Captain Grayder remained at his desk and continued to mourn the missing.

"Ah, here it is, four-seventy years back." His Excellency ran a plump finger along the printed lines. "Gandhi, sometimes called Bapu, or Father. Citizen of Hindi. Politico-philosopher. Opposed authority by means of an ingenious system called civil disobedience. Last remnants disappeared with the Great Explosion, but may still persist on some planet out of contact."

"Evidently it does," commented Grayder, his voice dry.

"Civil disobedience," repeated the ambassador, screwing up his eyes. He had the air of one trying to study something which was topsy-turvy. "They can't make *that* a social basis. It just won't work."

"It does work," asserted Harrison, forgetting to put in the "sir."

"Are you contradicting me, mister?"

"I'm stating a fact."

"Your excellency," Grayder began, "I suggest—"

"Leave this to me." His color deepening, the ambassador waved him off. His gaze remained angrily on Harrison. "You're very far from being an expert on socio-economic problems. Get that into your head, mister. Anyone of your caliber can be fooled by superficial appearances."

"It works," persisted Harrison, wondering where his own stubbornness was coming from.

"So does your tomfool bicycle. You've a bicycle mentality."

Something snapped, and a voice remarkably like his own said, "Nuts!" Astounded by this phenomenon, Harrison waggled his ears.

"What was that, mister?"

"Nuts!" he repeated, feeling that what has been done can't be undone.

Beating the purpling ambassador to the draw, Captain Grayder stood

up and exercised his own authority.

"Regardless of further leave-quotas, if any, you are confined to the ship until further notice. Now get out!"

He went out, his mind in a whirl but his soul strangely satisfied. Outside, First Mate Morgan glowered at him.

"How long d'you think it's going to take me to work through this list of names when guys like you squat in there for a week?" He grunted with ire, cupped hands round his mouth and bellowed, "Hope! Hope!"

No reply.

"Hope's been abandoned," remarked a wit.

"That's funny," sneered Morgan. "Look at me shaking all over." He cupped again, tried the next name. "Hyland! Hyland!"

No response.

Four more days, long, tedious, dragging ones. That made nine in all since the battleship formed the rut in which it was still sitting.

There was trouble on board. The third and fourth leave-quotas, put off repeatedly, were becoming impatient, irritable.

"Morgan showed him the third roster again this morning. Same result. Grayder admitted this world can't be defined as hostile and that we're entitled to run free."

"Well, why the heck doesn't he keep to the book? The Space Commission could crucify him for disregarding it."

"Same excuse. He says he's not denying leave, he's merely postponing it. That's a crafty evasion, isn't it? He says he'll grant it immediately the missing men come back."

"That might be never. Darn him, he's using them as an excuse to gyp me out of my time."

It was a strong and legitimate complaint. Weeks, months, years of close confinement in a constantly trembling bottle, no matter how large, demands ultimate release if only for a comparatively brief period. Men need fresh air, the good earth, the broad, clear-cut horizon, bulk-food, femininity, new faces.

"He *would* ram home the stopper just when we've learned the best way to get around. Civilian clothes and act like Gands, that's the secret. Even the first-quota boys are ready for another try."

"Grayder daren't risk it. He's lost too many already. One more quota cut in half and he won't have enough crew to take off and get back. We'd be stuck here for keeps. How'd you like that?"

"I wouldn't grieve."

"He could train the bureaucrats. Time those guys did some honest work."

"It'd take three years. That's how long it took to train you, wasn't it?"

Harrison came along holding a small envelope. Three of them picked on him at sight.

"Look who sassed Hizonner and got confined to ship—same as us!"

"That's what I like about it," Harrison observed. "Better to get fastened down for something than

for nothing."

"It won't be long, you'll see! We're not going to hang around bellyaching for ever. Mighty soon we'll *do* something."

"Such as what?"

"We're thinking it over," evaded the other, not liking to be taken up so fast. He noticed the envelope. "What have you got there? The day's mail?"

"Exactly that," Harrison agreed.

"Have it your own way. I wasn't being nosey. I thought maybe you'd got some more snafu. You engineers usually pick up that paper-stuff first."

"It *is* mail," said Harrison.

"G'wan, nobody has letters in this neck of the cosmos."

"I do."

"How did you get it?"

"Worrall brought it from town an hour back. Friend of mine gave him dinner, let him bring the letter to kill the ob." He pulled a large ear. "Influence, that's what you boys need."

Registering annoyance, one demanded, "What's Worrall doing off the boat? Is he privileged?"

"Sort of. He's married, with three kids."

"So what?"

"The ambassador figures that some people can be trusted more than others. They're not so likely to disappear, having too much to lose. So a few have been sorted out and sent into town to seek information about the missing men."

"They found out anything?"

"Not much. Worrall says it's a waste of time. He found a few of our men here and there, tried to persuade them to return, but each said, 'I won't.' The Gands all said, 'Myob!' And that's that."

"There must be something in it," decided one of them, thoughtfully. "I'd like to go see for myself."

"That's what Grayder's afraid of."

"We'll give him more than that to worry about if he doesn't become reasonable soon. Our patience is evaporating."

"Mutinous talk," Harrison reproved. He shook his head, looked sad. "You shock me."

He continued along the corridor, reached his own cabin, eyed the envelope. The writing inside might be feminine. He hoped so. He tore it open and had a look. It wasn't.

Signed by Gleed, the missive read, "Never mind where I am or what I'm doing—this might get into the wrong hands. All I'll tell you is that I'll be fixed up topnotch providing I wait a decent interval to improve acquaintance. The rest of this concerns *you.*"

"Huh?" He leaned back on his bunk, held the letter nearer the light.

"I found a little fat guy running an empty shop. He just sits there, waiting. Next, I learn that he's established possession by occupation. He's doing it on behalf of a factory that makes two-ball rollers—those fan-driven cycles. They want someone to operate the place as a local

roller sales and service depot. The little fat man has had four applications to date, but none with any engineering ability. The one who eventually gets this place will plant a functional-ob on the town, whatever that means. Anyway, this joint is yours for the taking. Don't be stupid. Jump in—the water's fine."

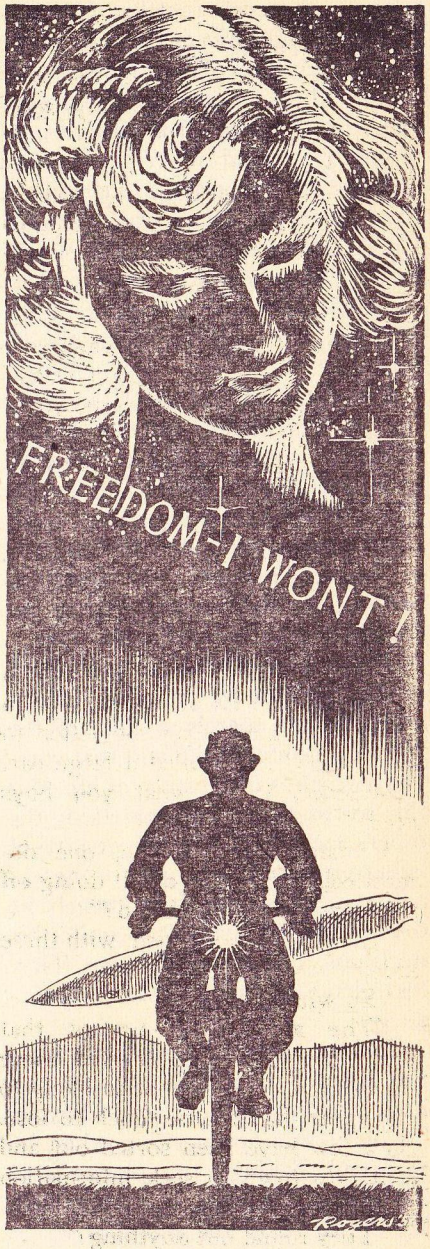
"Zipping meteors!" said Harrison. His eyes traveled on to the bottom.

"P.S. Seth will give you the address. P.P.S. This burg is your brunette's home town and she's thinking of coming back. She wants to live near her sister—and so do I. Said sister is a honey!"

He stirred restlessly, read it through a second time, got up and paced around his tiny cabin. There were twelve hundred occupied worlds within the scope of the Empire. He'd seen about one-tenth of them. No spaceman could live long enough to get a look at the lot. The service was divided into cosmic groups, each dealing with its own sector.

Except by hearsay, of which there was plenty and most of it highly colored, he would never know what heavens or pseudo-heavens existed in other sectors. In any case, it would be a blind gamble to pick an unfamiliar world for landbound life on someone else's recommendation. Not all think alike, or have the same tastes. One man's meat may be another's man's poison.

The choice for retirement—which was the unlovely name for begin-



ning another, different but vigorous life—was high-priced Terra or some more desirable planet in his own sector. There was the Epsilon group, fourteen of them, all attractive providing you could suffer the gravity and endure lumbering around like a tired elephant. There was Norton's Pink Heaven if, for the sake of getting by in peace, you could pander to Septimus Norton's rajah-complex and put up with his delusions of grandeur.

Up on the edge of the Milky Way was a matriarchy run by blonde Amazons, and a world of wizards, and a Pentecostal planet, and a globe where semisentient vegetables cultivated themselves under the direction of human masters; all scattered across forty light-years of space but readily accessible by Blieder-drive.

There were more than a hundred known to him by personal experience, though merely a tithe of the whole. All offered life and that company which is the essence of life. But this world, Gand, had something the others lacked. It had the quality of being present. It was part of the existing environment from which he drew data on which to build his decisions. The others were not. They lost virtue by being absent and faraway.

Inobtrusively, he made his way to the Blieder-room lockers, spent an hour cleaning and oiling his bicycle. Twilight was approaching when he returned. Taking a thin plaque from his pocket, he hung it on the wall, lay on his bunk and stared at it.

F—I.W.

The caller-system clicked, cleared its throat, announced, "All personnel will stand by for general instructions at eight hours tomorrow."

"I won't," said Harrison. He closed his eyes.

Seven-twenty in the morning, but nobody thought it early. There is little sense of earliness or lateness among space-roamers—to regain it they have to be landbound a month, watching a sun rise and set.

The chartroom was empty but there was much activity in the control cabin. Grayder was there with Shelton, Hame, Navigators Adamson, Werth and Yates and, of course, His Excellency.

"I never thought the day would come," groused the latter, frowning at the star map over which the navigators pored. "Less than a couple of weeks, and we get out, admitting defeat."

"With all respect, your excellency, it doesn't look that way to me," said Captain Grayder. "One can be defeated only by enemies. These people are not enemies. That's precisely where they've got us by the short hairs. They're not definable as hostile."

"That may be. I still say it's defeat. What else could you call it?"

"We've been outwitted by awkward relations. There's not much we can do about it. A man doesn't beat up his nieces and nephews merely because they won't speak to him."

"That's your viewpoint as a ship's

commander. You're confronted by a situation that requires you to go back to base and report. It's routine. The whole service is hidebound with routine." The ambassador again eyed the star map as if he found it offensive. "My own status is different. If I get out, it's a diplomatic defeat, an insult to the dignity and prestige of Terra. I'm far from sure that I ought to go. It might be better if I stayed put—though that would give them the chance to offer further insults."

"I would not presume to advise you what to do for the best," Grayder said. "All I know is this: we carry troops and armaments for any policing or protective purposes that might be found necessary here. But I can't use them offensively against these Gands because they've provided no pretext and because, in any case, our full strength isn't enough to crush twelve millions of them. We need an armada for that. We'd be fighting at the extreme of our reach —and the reward of victory would be a useless world."

"Don't remind me. I've stewed it until I'm sick of it."

Grayder shrugged. He was a man of action so long as it was action in space. Planetary shenanigans were not properly his pigeon. Now that the decisive moment was drawing near, when he would be back in his own attenuated element, he was becoming phlegmatic. To him, Gand was a visit among a hundred such, with plenty more to come.

"Your excellency, if you're in serious doubt whether to remain or come with us, I'd be favored if you'd reach a decision fairly soon. Morgan has given me the tip that if I haven't approved the third leave-quota by ten o'clock the men are going to take matters into their own hands and walk off."

"That would get them into trouble of a really hot kind, wouldn't it?"

"Some," agreed Captain Grayder, "but not so hot. They intend to turn my own quibbling against me. Since I have not officially forbidden leave, a walk-out won't be mutiny. I've merely been postponing leave. They could plead before the Space Commission that I've deliberately ignored regulations. They might get away with it if the members were in the mood to assert their authority."

"The Commission ought to be taken on a few long flights," opined His Excellency. "They'd discover some things they'll never learn behind a desk." He eyed the other in mock hopefulness. "Any chance of accidentally dropping our cargo of bureaucrats overboard on the way back? A misfortune like that might benefit the spaceways, if not humanity."

"That idea strikes me as Gandish," observed Grayder.

"They wouldn't think of it. Their technique is to say no, no, a thousand times no. That's all—but judging by what has happened here, it is enough." The ambassador pondered his predicament, reached a decision. "I'm coming with you. It goes against the grain because it smacks

of surrender. To stay would be a defiant gesture, but I've got to face the fact that it won't serve any useful purpose at the present stage."

"Very well, your excellency." Grayder went to a port, looked through it toward the town. "I'm down about four hundred men. Some of them have deserted, for keeps. The rest will come back if I wait long enough. They've struck lucky, got their legs under somebody's table and gone A.W.O.L. and they're likely to extend their time for as long as the fun lasts on the principle that they may as well be hung for sheep as lambs. I get that sort of trouble on every long trip. It's not so bad on short ones." A pause while moodily he surveyed a terrain bare of returning prodigals. "But we can't wait for them. Not here."

"No, I reckon not."

"If we hang around any longer, we're going to lose another hundred or two. There won't be enough skilled men to take the boat up. Only way I can beat them to the draw is to give the order to prepare for take-off. They all come under flight-regulations from that moment." He registered a lopsided smile. "That will give the space lawyers something to think about!"

"As soon as you like," approved the ambassador. He joined the other at the port, studied the distant road, watched three Gand coaches whirl along it without stopping. He frowned, still upset by the type of mind which insists on pretending that a mountain isn't there. His attention shifted sidewise, toward the tail-end. He stiffened and said, "What are those men doing outside?"

Shooting a swift glance in the same direction, Grayder grabbed the caller-mike and rapped, "All personnel will prepare for take-off at once!" Juggling a couple of switches, he changed lines, said, "Who is that? Sergeant major Bidworthy? Look, sergeant major, there are half a dozen men beyond the midship lock. Get them in immediately—we're lifting as soon as everything's ready."

The fore and aft gangways had been rolled into their stowage spaces long before. Some fast-thinking quartermaster prevented further escapes by operating the midship ladder-wind, thus trapping Bidworthy along with more would-be sinners.

Finding himself stalled, Bidworthy stood in the rim of the lock and glared at those outside. His mustache not only bristled, but quivered. Five of the offenders had been members of the first leave-quota. One of them was a trooper. That got his rag out, a trooper. The sixth was Harrison, complete with bicycle polished and shining.

Searing the lot of them, the trooper in particular, Bidworthy rasped, "Get back on board. No arguments. No funny business. We're taking off."

"Hear that?" asked one, nudging the nearest. "Get back on board. If you can't jump thirty feet, you'd better flap your arms and fly."

"No sauce from you," roared Bidworthy. "I've got my orders."

"He takes orders," remarked the trooper. "At his age."

"Can't understand it," commented another, shaking a sorrowful head.

Bidworthy scrabbled the lock's smooth rim in vain search of something to grasp. A ridge, a knob, a projection of some sort was needed to take the strain.

"I warn you men that if you try me too—"

"Save your breath, Biddy," interjected the trooper. "From now on, I'm a Gand." With that, he turned and walked rapidly toward the road, four following.

Getting astride his bike, Harrison put a foot on a pedal. His back tire promptly sank with a loud *whee-e-e.*

"Come back!" howled Bidworthy at the retreating five. He made extravagant motions, tried to tear the ladder from its automatic grips. A siren keened thinly inside the vessel. That upped his agitation by several ergs.

"Hear that?" With vein-pulsing ire, he watched Harrison tighten the rear valve and apply his hand pump. "We're about to lift. For the last time—"

Again the siren, this time in a quick series of shrill toots. Bidworthy jumped backward as the seal came down. The lock closed. Harrison again mounted his machine, settled a foot on a pedal but remained watching.

The metal monster shivered from nose to tail then rose slowly and in utter silence. There was stately magnificence in the ascent of such enormous bulk. It increased its rate of climb gradually, went faster, faster, became a toy, a dot and finally disappeared.

For just a moment, Harrison felt a touch of doubt, a hint of regret. It soon passed away. He glanced toward the road.

The five self-elected Gands had thumbed a coach which was picking them up. That was co-operation apparently precipitated by the ship's disappearance. Quick on the uptake, these people. He saw it move off on huge rubber balls, bearing the five with it. A fan-cycle raced in the opposite direction, hummed into the distance.

"Your brunette," Gleed had described her. What gave him that idea? Had she made some remark which he'd construed as complimentary because it made no reference to outsize ears?

He had a last look around. The earth to his left bore a great curved rut one mile long by twelve feet deep. Two thousand Terrans had been there.

Then about eighteen hundred.

Then sixteen hundred.

Less five.

"One left—me!" he said to himself.

Giving a fatalistic shrug, he put the pressure on and rode to town.

And then there were none.

THE END

BAIT

BY ROY L. CLOUGH, JR.

It is always important, in seeking the answer to an extremely complex, delicate problem, to remember the important basic of the scientific method: the simplest answer is the most powerful.

Illustrated by Orban

Police Chief O'Neil Davis watched the great metal bubble of the Moon shuttle carrier float down into its cradle. He squinted his eyes a scant fraction of a second before the dissipators flashed and sighed audibly.

Security commissioner Morley eyed the dissipator ring. Some of the coils were still glowing dull red as the last trickles of kinetic energy converted into light and heat. His unlit cigar rotated slowly in his mouth. "I wonder," he said, "just what kind of a load we get this time."

Chief Davis shrugged, "The old order changeth." He diddled the point of a pencil against the corner of his desk blotter. "Someday I shall write me a book on the problems imposed upon law enforcement agencies by extraterrestrial life forms." He pulled open the top drawer of his desk and took out a flimsy. "We got the windup on that Martian watch deal."

"Oh?"

"Only twelve thousand were smuggled in. Half of them were located before sale. Most of the rest have been recovered and restitution made. Diplomatic apologies of course —for whatever they are worth."

"What I can't understand is how they were able to make such a good quality timepiece so cheaply."

"They couldn't. We know, unofficially of course, what the real deal

was—a production surplus. One of the Geeks slipped up somewhere and didn't shut the robot machines off after the order had been filled. That left them with twelve thousand-odd watches, the raw materials for which had to be accounted for. So they get the bright idea of smuggling them to Earth and selling them on the side at a price that'll cover the raw materials in them and the cost of getting them here. This way they figure to break even and write off the surplus."

"And a lot of suckers think they're buying fifty-dollar watches for five dollars."

"In a sense, they were," Chief Davis grinned wryly, "only the Geeks neglected to tell them about the five extra minutes built into every hour—Martian days being twenty-six Earth-hours long."

Morley said: "You did a good job on that case—but I'm here to discuss another matter with you. No doubt you know what I mean?"

The grin vanished from Chief Davis' face and was replaced with a worried frown. "I'm afraid I do."

Morley bit down hard on his cigar and reached for the desk lighter. "This thing is becoming very embarrassing to us," he said between puffs of blue smoke. "There seems to be a chance of interplanetary friction developing over the stand being taken—hints are being cast out by some of the tele-tabloids."

"The Elusians are a very sensitive

race," Chief Davis admitted, "and this is just the sort of thing the sensational press likes to keep raking over. I know, it embarrasses me too; but I can see the news value in a burglar who is so clever he can repeatedly outwit the best mechanical and electronic protective devices."

"What's the latest tally?"

"Twenty-four 'jobs,' the last two within the past week." Chief Davis hesitated, "And you won't like this: we haven't got a single lead on him—except along the lines the newsboys have been hinting at."

"Elusian?"

"Something like that. That is what makes it so tough. Here we have an interesting situation—the perfect burglar, from a criminal point of view, apparently a member of a race that is completely and absolutely psychologically incapable of knowingly committing a dishonest act."

"And a touchy and sensitive race at that," said Morley, "to whom the merest mention of the possibility of dishonesty of one of their race would be a mortal insult."

"With the fact remaining that only an Elusian has the, ah, physical peculiarities which would make it possible to nullify the effects of protective equipment."

"Well," said Morley, "what do *you* think?"

Chief Davis rubbed the ball of his thumb on his cheek and stared out the window. "To be very frank with you, commissioner, I'm not thinking, and I'll tell you why. I'd like to keep my sanity. I've been over this thing, every scrap of information that has turned up, or been dug up, I've gone over a dozen times." He looked steadily at Morley, "The truth of the matter is that the facts are mutually exclusive."

Morley returned his calm gaze with an effort. "That is quite a statement to make, chief."

"I'm aware of that."

"Aren't you going to do anything?"

"Certainly. I said I wasn't thinking—of identities. I know it's your business to worry about the identity of the thief, and the newsboys may consider it their province to speculate about his identity, but to me, it makes little difference."

"Meaning?"

"I'll catch who I'll catch when I catch him."

"Um-m-m. You know, I rather had the idea that modern protective measures had just about eliminated burglary."

"That, to some extent, is just the trouble. We've had hardly a case of any importance in the past hundred years. Burglary no longer pays. The invention of the body-wave machine licked the burglary problem over night. Add to this the automatic alarms, trip wires, window switches and all—which most places have—and burglary is impossible."

"Only it isn't."

"Exactly. Paradoxically, we can *prevent* crimes of this nature; but we can't do anything about them

after they have been committed. There is a good reason for this. Burglary, as a profession, has been out of circulation for so long that the appurtenances have disappeared. In the old days a burglar was by no means self-sufficient. Stealing the goods was only half the job. Once he had the loot he had to run around looking for a professional receiver of stolen goods. It was at this level, and in connection with such disposals that arrests could be made and solutions arrived at."

"Meaning, perhaps, that in order to control crime, one needs crime?" Morley looked thoughtful.

"In a sense, yes. In this case our super-thief needs no auxiliary criminal in order to stay 'in business.' He has been taking only money."

"But to take the money he must first get by the burglar-proof body-wave field and several other protective devices."

Chief Davis nodded. "Of course. That is why I said the facts seem to be mutually exclusive. Fact one: No Terran, or for that matter any humanoid type can penetrate a body-wave field. Fact two: No Elusian can be psychologically capable of crime. Fact three: Fact one and fact two contradict fact number four—"

"Which is?"

"That somebody is getting through and taking the money."

Commissioner Morley scratched his head. "Give me this Elusian business again."

"One of the first things a professional law-man learns is the details of the Ellus-Earth, or as it is more commonly called, the Elusian protective treaty."

"Something about their delicate nervous systems isn't it?"

"Delicate is the word for it. The Elusians are a very remarkable race, of great interest to evolutionists. They had a dominant mutation very recently, perhaps only a thousand Earth-years ago. Much of their body and mind structure is crystalline in nature. Because of this they are extremely sensitive to certain types of radiation and fields which a humanoid would be incapable of detecting. The simple body-wave field, for example, which is used as a protective measure, is death or insanity for an Elusian. Several severe injuries happened to the first of them to visit Earth—that being the primary cause for the treaty."

"That I understand," said Morley, "and under the treaty some sort of gadget shuts off protective fields when an Elusian approaches?"

"That is basically correct. Certain areas, and this includes all major spaceports, are specified as safe for Elusians. That means, all protective devices, of the field-generating type, are fitted with automatic shutoffs, tuned to the body frequency common to Elusians."

"Sounds like both an expensive and risky business."

"In one sense it is, in another it is not. Elusian products are extremely valuable to us, and vice

versa. Too, don't forget that Elusians are completely honest."

"You seem quite certain of that."

"I am. It is because of the way their motivation process works. In school I've been through the whole thing over and over. It is the way the Elusian brain works and it can't work to produce a dishonest act. I know it seems fantastic, but it's true."

"I should think this would have been taken advantage of by some mobsters. For instance, what is to prevent them from kidnaping an Elusian and forcing him to go along and spring the locks for them?"

"The fact that it won't work that way. It was tried of course. Provision for this exigency was made in the treaty. The devices don't shut down if the Elusian is in company with anybody else—of another race, that is."

"Which, since you say it has been tried, must have been rough on some Elusians."

"It was. Also rough on the Terran who tried it. Under the terms of the treaty kidnaping or detaining an Elusian carries the death penalty. Mandatory and no recourse."

"You've given me quite a bit of background on this," said Morley, "which helps me to understand it better, but it makes it a bit harder for me to say what I have to. I'm here at the instructions of the rest of the commissioners. Did you know?"

"I suspected."

"I can give it to you straight then. The point is that this 'Ghost' burglar business has been making entirely too much stir. We appreciate your difficulties, but that is your line of business. We want the matter cleaned up. We've got diplomatic pressure on us, so we've got to put pressure on you. It boils down to a question of either, or."

"I see."

"What shall I tell them?"

Chief Davis stared out the window, idly watched the line of individuals descending the ramp from the Moon shuttle. He rather liked being chief of police—a good job; good pay; nice social standing. It had its headaches, but it was the one job he knew he fitted best. He thought it all over, then he said:

"Tell you what, commissioner. You may let them know I said I'd have the 'Ghost' burglar in two weeks or I'll mail in my resignation."

And after Morley had left he sat there staring at the panel which had closed on his back and wondered how he would do it.

It was a pretty plausible story and the tele-news sheets obligingly printed it without editing. It briefly recounted the long chain of burglaries, told of the great cunning of the thief and of his seemingly imperviousness to protective fields. It stated that after a long study of the matter a new and different protective system had been worked out and was now in use in "several places." Chief of Police O'Neil Davis was credited

with the development of the system, and he was quoted as saying that he was certain a foolproof method of dealing with the situation had been worked out.

As a protective measure it was probably a little short in the ethics department, but as a trap it was a dilly.

The stout oak table stood in the middle of the cage area behind the cashier's windows. On it was stacked several hundred dollars in one's, five's and ten's. Good usable wrinkled money with dirty edges. Four feet away, clamped to the other end of the table was an ancient riot gun, aimed squarely at the money. The gun had an interesting feature; bolted in place around the trigger mechanism was a black metal box. Obligingly it was fitted with a heavy plate glass cover that exposed a two-way magnetic trip resting against the trigger. From the box a couple of copper wires ran to the pile of money. The wires were neatly stitched through each pile of bills and from there ran to a wall socket power supply.

Anybody could see plainly what the setup was. If one jiggled the wires, the mechanism would be set off; if one unplugged the wall socket, the residual currents would cease and the switch would trip, and, of course, the same thing would happen if the wires were cut. A technician, studying the thing a bit more deeply would also reason that bringing any tools near the box would also set off the mechanism. And he'd be right.

Commissioner Morley snorted. "The most asinine thing I ever saw. It's so obvious."

Chief Davis smiled tightly. "You don't like it? I thought it was a rather good psychological challenge."

"And shutting down all the other protective equipment? It seems you're practically inviting the 'Ghost' to help himself."

"I'm accepting the responsibility," replied Davis. He took the last cigarette from the gay-colored plastic package, crumpled the container and tossed it on the floor. Morley shook his head disgustedly and started out. "Be with you in a minute," Davis called out, "I want to give the thing a final check." The policeman saw Morley's back turn toward him. Quickly he checked over the mechanism. He wanted to be very certain of one thing.

That the gun wasn't loaded!

It was a rather impudent bit of business.

The money, of course, was gone.

It did not require a great deal of detective work to figure out how it had been accomplished. The burglar, working with remarkable skill had simply unscrewed the plate glass cover from the firing mechanism attached to the ancient riot gun. The nonmetallic screw driver he had used still lay on the table. Jammed between the trigger and its guard, effectively preventing any motion of the trip, were rolled-up bits of a

plastic cigarette package.

Nor was the final touch missing. The heavy enameled wire was twisted in curlicues across the table top. It read:

THANK YOU

Commissioner Morley's face was grave as he filed into Chief Davis' office at the head of a line of commissioners. He got right to the point. "Davis, we've all seen this morning's telecast of the failure of your absurd protective system."

Davis seemed quite at ease. "Sit down, gentlemen. Now what is it you wanted?"

The byplay annoyed Morley. "That's not all. This trick of shutting down the protective body-wave field has annoyed the Elusian envoy. He says it makes it pretty obvious that no Terran or Martian is suspected and that his people are highly incensed at the implication."

"He is, is he?"

"Don't try to make light of it." Morley's face was dark.

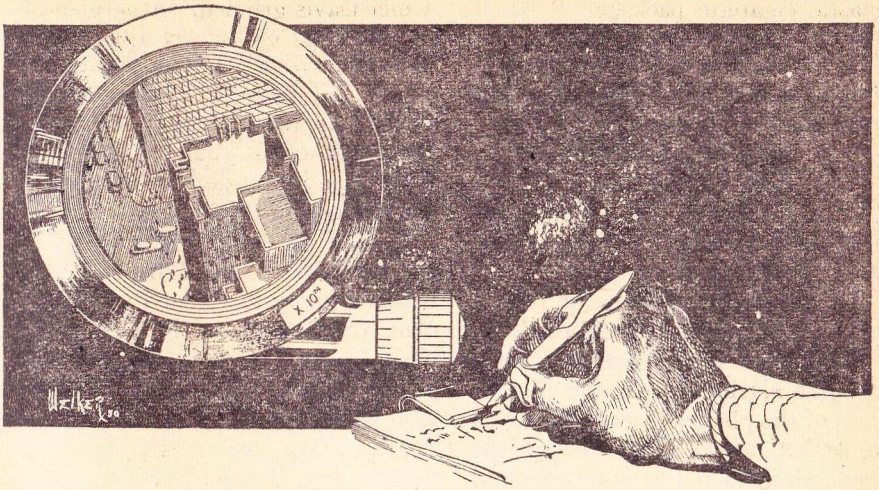
"Tell him to relax. It wasn't an Elusian, it was a Terran. One of my boys picked him up an hour ago."

Chief Davis grinned, "A very clever lad. He was a specialist in protective devices. He had rigged himself a body-wave transformer that altered the human pattern to that of an Elusian." He helped himself to a cigarette, glanced from the plastic package to Morley, then back again and chuckled. "A very clever chap, but he spilled it all under a shot of pentathol. The story will be on the views at the next flash."

Morley was plainly relieved, but just as plainly puzzled. "I don't see how such a cockeyed setup as that gun and wire business—" he broke off.

"You don't?" Davis asked. He studied his fingernails in leisurely fashion. No point in rushing it. Give the commissioners a chance to see they had a very capable chief of police. That was a good title. He was glad he'd be keeping it. Finally he said: "Simple. Sometimes it's much easier to catch a smart crook then a dumb one." He buffed his nails on the desk blotter and looked up at them. "Very simple. He tried to pass money with holes in it."

THE END



BREEDS THERE A MAN...?

BY ISAAC ASIMOV

It was a very interesting — and, of course, highly improbable — theory for a first-rate physicist to come up with. But something not quite human seemed to be causing a bit of trouble . . .

Illustrated by Welker

Police Sergeant Mankiewicz was on the telephone and he wasn't enjoying it. His conversation was sounding like a one-sided view of a firecracker.

He was saying, "That's right! He came in here and said, 'Put me in jail, because I want to kill myself.'

". . . I can't help that. Those were his exact words. It sounds crazy to me, too.

". . . Look, mister, the guy answers the description. You asked me for information and I'm giving it to you.

". . . He has exactly that scar on his right cheek and he said his name

was John Smith. He didn't say it was Doctor anything-at-all.

". . . Well, sure it's a phony. Nobody is named John Smith. Not in a police station, anyway.

". . . He's in jail now.

". . . Yes, I mean it.

". . . Resisting an officer; assault and battery; malicious mischief. That's three counts.

". . . I don't care who he is.

". . . All right. I'll hold on."

He looked up at Officer Brown and put his hand over the mouthpiece of the phone. It was a ham of a hand that nearly swallowed up the phone altogether. His blunt-featured face was ruddy and steaming under a thatch of pale-yellow hair.

He said, "Trouble! Nothing but trouble at a precinct station. I'd rather be pounding a beat any day."

"Who's on the phone?" asked Brown. He had just come in and didn't really care. He thought Mankiewicz would look better on a suburban beat, too.

"Oak Ridge. Long Distance. A guy called Grant. Head of the somethingological division, and now he's getting somebody else at seventy-five cents a min . . . Hello!"

Mankiewicz got a new grip on the phone and held himself down.

"Look," he said, "let me go through this from the beginning. I want you to get it straight and then if you don't like it, you can send someone down here. The guy doesn't want a lawyer. He claims he just wants to stay in jail and, brother, that's all right with me.

"Well, will you listen? He came in yesterday, walked right up to me, and said, 'Officer, I want you to put me in jail because I want to kill myself.' So I said, 'Mister, I'm sorry you want to kill yourself. Don't do it, because if you do, you'll regret it the rest of your life.'

". . . I *am* serious. I'm just telling you what I said. I'm not saying it was a funny joke, but I've got my own troubles here, if you know what I mean. Do you think all I've got to do here is to listen to cranks who walk in and—

". . . Give me a chance, will you? I said, 'I can't put you in jail for wanting to kill yourself. That's no crime.' And he said, 'But I don't want to die.' So I said, 'Look, bud, get out of here.' I mean if a guy wants to commit suicide, all right, and if he doesn't want to, all right, but I don't want him weeping on my shoulder.

". . . I'm *getting* on with it. So he said to me, 'If I commit a crime, will you put me in jail?' I said, 'If you're caught and if someone files a charge and you can't put up bail, we will. Now beat it.' So he picked up the inkwell on my desk and before I could stop him, he turned it upside down on the open police blotter.

". . . That's right! Why do you think we have 'malicious mischief' tabbed on him? The ink ran down all over my pants.

". . . Yes, assault and battery, too! I came hopping down to shake a little sense into him, and he kicked

me in the shins and handed me one in the eye.

". . . I'm not making this up. You want to come down here and look at my face?

". . . He'll be up in court one of these days. About Thursday, maybe.

". . . Ninety days is the least he'll get, unless the psychoes say otherwise. I think he belongs in the loony-bin myself.

". . . Officially, he's John Smith. That's the only name he'll give.

". . . No, sir, he doesn't get released without the proper legal steps.

". . . O.K., you do that, if you want to, bud! I just do my job here."

He banged the phone into its cradle, glowered at it, then picked it up and began dialing. He said, "Gianetti?", got the proper answer and began talking:

"What's the A.E.C.? I've been talking to some Joe on the phone and he says—

". . . No, I'm not kidding, lunkhead. If I were kidding, I'd put up a sign. What's the alphabet soup?"

He listened, said, "Thanks" in a small voice, and hung up again.

He had lost some of his color. "That second guy was the head of the Atomic Energy Commission," he said to Brown. "They must have switched me from Oak Ridge to Washington."

Brown lounged to his feet, "Maybe the F.B.I. is after this John Smith guy. Maybe he's one of these here scientists." He felt moved to philosophy. "They ought to keep atomic secrets away from those guys. Things were O.K. as long as General Groves was the only fella who knew about the atom bomb. Once they cut in these here scientists on it, though—"

"Ah, shut up," snarled Mankiewicz.

Dr. Oswald Grant kept his eyes fixed on the white line that marked the highway and handled the car as though it were an enemy of his. He always did. He was tall and knobby with a withdrawn expression stamped on his face. His knees crowded the wheel, and his knuckles whitened whenever he made a turn.

Inspector Darrity sat beside him with his legs crossed so that the sole of his left shoe came up hard against the door. It would leave a sandy mark when he took it away. He tossed a nut-brown penknife from hand to hand. Earlier, he had unsheathed its wicked, gleaming blade and scraped casually at his nails as they drove, but a sudden swerve had nearly cost him a finger and he desisted.

He said, "What do you know about this Ralson?"

Dr. Grant took his eyes from the road momentarily, then returned them. He said, uneasily, "I've known him since he took his doctorate at Princeton. He's a very brilliant man."

"Yes? Brilliant, huh? Why is it that all you scientific men describe one another as 'brilliant'? Aren't there any mediocre ones?"

"Many. I'm one of them. But Ralson isn't. You ask anyone. Ask Oppenheimer. Ask Bush. He was the youngest observer at Alamogordo."

"O.K. He was brilliant. What about his private life?"

Grant waited, "I wouldn't know."

"You know him since Princeton. How many years is that?"

They had been scouring north along the highway from Washington for two hours with scarcely a word between them. Now Grant felt the atmosphere change and the grip of the law on his coat collar.

"He got it in '43."

"You've known him eight years then."

"That's right."

"And you don't know about his private life?"

"A man's life is his own, inspector. He wasn't very sociable. A great many of the men are like that. They work under pressure and when they're off the job, they're not interested in continuing the lab acquaintanceships."

"Did he belong to any organizations that you know of?"

"No."

The inspector said, "Did he ever say anything to you that might indicate he was disloyal?"

Grant shouted, "No!" and there was silence for a while.

Then Darrity said, "How important is Ralson in atomic research?"

Grant hunched over the wheel and said, "As important as any one man can be. I grant you that no one is indispensable, but Ralson has always seemed to be rather unique. He has the engineering mentality."

"What does that mean?"

"He isn't much of a mathematician himself, but he can work out the gadgets that put someone else's math into life. There's no one like him when it comes to that. Time and again, inspector, we've had a problem to lick and no time to lick it in. There were nothing but blank minds all around until he put some thought into it and said, 'Why don't you try so-and-so?' Then he'd go away. He wouldn't even be interested enough to see if it worked. But it always did. Always! Maybe we would have got it ourselves eventually, but it might have taken months of additional time. I don't know how he does it. It's no use asking him either. He just looks at you and says, 'It was obvious.' and walks away. Of course, once he's shown us how to do it, it *is* obvious."

The inspector let him have his say out. When no more came, he said, "Would you say he was queer, mentally? Erratic, you know."

"When a person is a genius, you wouldn't expect him to be normal, would you?"

"Maybe not. But just how abnormal was this particular genius."

"He never talked, particularly. Sometimes, he wouldn't work."

"Stayed at home and went fishing instead?"

"No. He came to the labs all right; but he would just sit at his desk. Sometimes that would go on

for weeks. Wouldn't answer you, or even look at you, when you spoke to him."

"Did he ever actually leave work altogether?"

"Before now, you mean? Never!"

"Did he ever claim he wanted to commit suicide? Ever say he wouldn't feel safe except in jail?"

"No."

"You're sure this John Smith is Ralson."

"I'm almost positive. He has a chemical burn on his right cheek that can't be mistaken."

"O.K. That's that, then I'll speak to him and see what he sounds like."

The silence fell for good this time. Dr. Grant followed the snaking line as Inspector Darrity tossed the penknife in low arcs from hand to hand.

The warden listened to the call-box and looked up at his visitors, "We can have him brought up here, inspector, regardless."

"No," Dr. Grant shook his head. "Let's go to him."

Darrity said, "Is that normal for Ralson, Dr. Grant? Would you expect him to attack a guard trying to take him out of a prison cell."

Grant said, "I can't say."

The warden spread a calloused palm. His thick nose twitched a little, "We haven't tried to do anything about him so far because of the telegram from Washington, but, frankly, he doesn't belong here. I'll be glad to have him taken off my hands."

"We'll see him in his cell," said Darrity.

They went down the hard, bar-lined corridor. Empty, incurious eyes watched their passing.

Dr. Grant felt his flesh crawl, "Has he been kept *here* all the time?"

Darrity did not answer.

The guard, pacing before them, stopped, "This is the cell."

Darrity said, "Is that Dr. Ralson?"

Dr. Grant looked silently at the figure upon the cot. The man had been lying down when they first reached the cell, but now he had risen to one elbow and seemed to be trying to shrink into the wall. His hair was sandy and thin, his figure slight, his eyes blank and china-blue. On his right cheek there was a raised pink patch that tailed off like a tadpole.

Dr. Grant said, "That's Ralson."

The guard opened the door and stepped inside, but Inspector Darrity sent him out again with a gesture. Ralson watched them mutely. He had drawn both feet up to the cot and was pushing backwards. His Adam's apple bobbled as he swallowed.

Darrity said, quietly, "Dr. Elwood Ralson?"

"What do you want?" The voice was a surprising baritone.

"Would you come with us, please? We have some questions we would like to ask you."

"No! Leave me alone!"

"Dr. Ralson," said Grant. "I've

been sent here to ask you to come back to work."

Ralson looked at the scientist and there was a momentary glint of something other than fear in his eyes. He said, "Hello, Grant." He got off his cot, "Listen, I've been trying to have them put me into a padded cell. Can't you make them do that for me? You know me, Grant. I wouldn't ask for something I didn't feel was necessary. Help me. I can't stand the hard walls. It makes me want to . . . bash —" He brought the flat of his palm thudding down against the hard, dull-gray concrete behind his cot.

Darrity looked thoughtful. He brought out his penknife and unbent the gleaming blade. Carefully, he scraped at his thumbnail, and said, "Would you like to see a doctor?"

But Ralson didn't answer that. He followed the gleam of metal and his lips parted and grew wet. His breath became ragged and harsh.

He said, "Put that away!"

Darrity paused, "Put what away?"

"The knife. Don't hold it in front of me. I can't stand looking at it."

Darrity said, "Why not?" He held it out, "Anything wrong with it? It's a good knife."

Ralson lunged. Darrity stepped back and his left hand came down on the other's wrist. He lifted the knife high in the air, "What's the matter, Ralson? What are you after?"

Grant cried a protest but Darrity waved him away.

Darrity said, "What do you want, Ralson?"

Ralson tried to reach upward, and bent under the other's appalling grip. He gasped, "Give me the knife."

"Why, Ralson? What do you want to do with it?"

"Please. I've got to—" He was pleading, "I've got to stop living."

"You want to die?"

"No. But I must."

Darrity shoved. Ralson flailed backward and tumbled into his cot, so that it squeaked noisily. Slowly, Darrity bent the blade of his penknife into its sheath and put it away. Ralson covered his face. His shoulders were shaking but otherwise he did not move.

There was the sound of shouting from the corridor, as the other prisoners reacted to the noise issuing from Ralson's cell. The guard came hurrying down, yelling "Quiet!" as he went.

Darrity looked up, "It's all right, guard."

He was wiping his hands upon a large white handkerchief, "I think we'll get a doctor for him."

Dr. Gottfried Blaustein was small and dark and spoke with a trace of an Austrian accent. He needed only a small goatee to be the layman's caricature of a psychiatrist. But he was clean-shaven, and very carefully dressed. He watched Grant carefully, assessing him, blocking in cer-

tain observations and deductions. He did this automatically, now, with everyone he met.

He said, "You give me a sort of picture. You describe a man of great talent, perhaps even genius. You tell me he has always been uncomfortable with people; that he has never fitted in with his laboratory environment, even though it was there that he met the greatest of success. Is there another environment to which he has fitted himself?"

"I don't understand."

"It is not given to all of us to be so fortunate as to find a congenial type of company at the place or in the field where we find it necessary to make a living. Often, one compensates by playing an instrument, or going hiking, or joining some club. In other words, one creates a new type of society, when not working, in which one can feel more at home. It need not have the slightest connection with what his ordinary occupation is. It is an escape, and not necessarily an unhealthy one." He smiled and added, "Myself, I collect stamps. I am an active member of the American Society of Philatelists."

Grant shook his head, "I don't know what he did outside working hours. I doubt that he did anything like what you've mentioned."

"Um-m-m. Well, that would be sad. Relaxation and enjoyment are wherever you find them; but you must find them somewhere, no?"

"Have you spoken to Dr. Ralson, yet?"

"About his problems? No."

"Aren't you going to?"

"Oh, yes. But he has been here only a week. One must give him a chance to recover. He was in a highly excited state when he first came here. It was almost a delirium. Let him rest and become accustomed to the new environment. I will question him, then."

"Will you be able to get him back to work?"

Blaustein smiled, "How should I know? I don't even know what his sickness is?"

"Couldn't you at least get rid of the worst of it; this suicidal obsession of his, and take care of the rest of the cure while he's at work."

"Perhaps. I couldn't even venture an opinion so far without several interviews."

"How long do you suppose it will all take?"

"In these matters, Dr. Grant, nobody can say."

Grant brought his hands together in a sharp slap, "Do what seems best then. But this is more important than you know."

"Perhaps. But you may be able to help me, Dr. Grant."

"How?"

"Can you get me certain information which may be classified as top secret."

"What kind of information?"

"I would like to know the suicide rate, since 1945, among nuclear scientists. Also, how many have left their jobs to go into other types of

scientific work, or to leave science altogether."

"Is this in connection with Ralson?"

"Don't you think it might be an occupational disease, this terrible unhappiness of his?"

"Well— A good many have left their jobs, naturally."

"Why naturally, Dr. Grant?"

"You must know how it is, Dr. Blaustein. The atmosphere in modern atomic research is one of great pressure and red tape. You work with the Government; you work with military men. You can't talk about your work; you have to be careful what you say. Naturally, if you get a chance at a job in a University, where you can fix your own hours, do your own work, write papers that don't have to be submitted to the A.E.C., attend conventions that aren't held behind locked doors, you take it."

"And abandon your field of specialty forever."

"There are always nonmilitary applications. Of course, there was one man who did leave for another reason. He told me once he couldn't sleep nights. He said he'd hear one hundred thousand screams coming from Hiroshima, when he put the lights out. The last I heard of him he was a clerk in a haberdashery."

"And do you ever hear a few screams yourself."

Grant nodded, "It isn't a nice feeling to know that even a little of the responsibility of atomic destruction might be your own."

"How did Ralson feel?"

"He never spoke of anything like that."

"In other words, if he felt it, he never even had the safety-valve effect of letting off steam to the rest of you."

"I guess he hadn't."

"Yet nuclear research must be done, no?"

"I'll say."

"What would you do, Dr. Grant, if you felt you *had* to do something that you *couldn't* do."

Grant shrugged, "I don't know."

"Some people kill themselves."

"You mean that's what has Ralson down."

"I don't know. I do not know. I will speak to Dr. Ralson this evening. I can promise nothing, of course, but I will let you know whatever I can."

Grant rose, "Thanks, doctor. I'll try to get the information you want."

Elwood Ralson's appearance had improved in the week he had been at Dr. Blaustein's sanitarium. His face had filled out and some of the restlessness had gone out of him. He was tieless and beltless. His shoes were without laces.

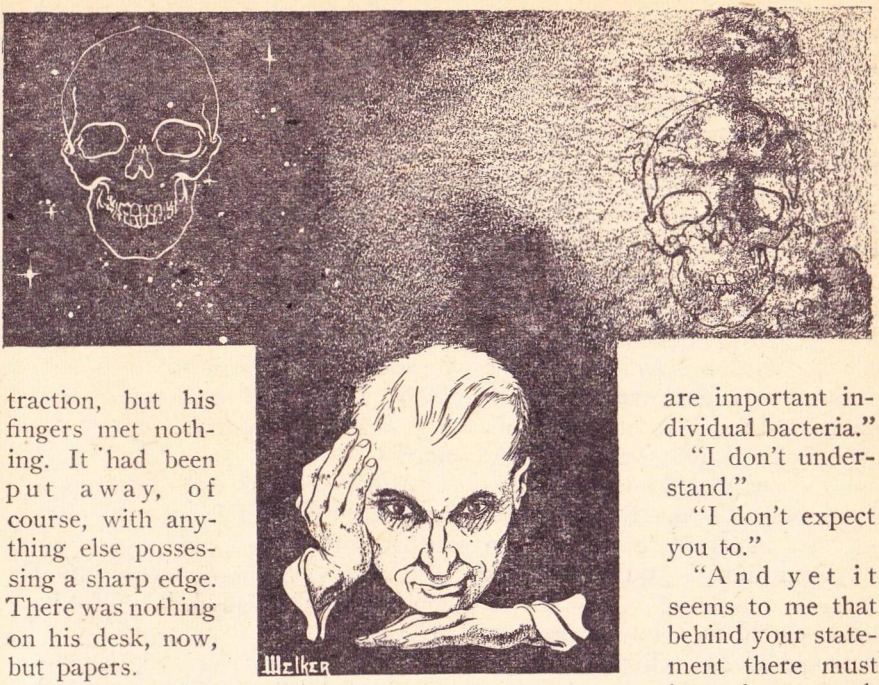
Blaustein said, "How do you feel, Dr. Ralson?"

"Rested."

"You have been treated well?"

"No complaints, doctor."

Blaustein's hand fumbled for the letter-opener with which it was his habit to play during moments of ab-



traction, but his fingers met nothing. It had been put away, of course, with anything else possessing a sharp edge. There was nothing on his desk, now, but papers.

He said, "Sit down, Dr. Ralson. How do your symptoms progress?"

"You mean, do I have what you would call a suicidal impulse? Yes. It gets worse or better, depending on my thoughts, I think. But it's always with me. There is nothing you can do to help."

"Perhaps you are right. There are often things I cannot help. But I would like to know as much as I can about you. You are an important man—"

Ralson snorted.

"You do not consider that to be so?" asked Blaustein.

"No, I don't. There are no important men, any more than there are important individual bacteria."

"I don't understand."

"I don't expect you to."

"And yet it seems to me that behind your statement there must have been much thought. It would certainly be of the greatest interest to have you tell me some of this thought."

For the first time, Ralson smiled. It was not a pleasant smile. His nostrils were white. He said, "It is amusing to watch you, doctor. You go about your business so conscientiously. You must listen to me, mustn't you, with just that air of phony interest and unctuous sympathy. I can tell you the most ridiculous things and still be sure of an audience, can't I?"

"Don't you think my interest can be real, even granted that it is professional, too?"

"No, I don't."

"Why not?"

"I'm not interested in discussing it."

"Would you rather return to your room?"

"If you don't mind. No!" His voice had suddenly suffused with fury as he stood up, then almost immediately sat down again, "Why shouldn't I use you? I don't like to talk to people. They're stupid. They don't see things. They stare at the obvious for hours and it means nothing to them. If I spoke to them, they wouldn't understand; they'd lose patience; they'd laugh. Whereas you must listen. It's your job. You can't interrupt to tell me I'm mad, even though you may think so."

"I'd be glad to listen to whatever you would like to tell me."

Ralson drew a deep breath, "I've known something for a year now, that very few people know. Maybe it's something no *live* person knows. Do you know that human cultural advances come in spurts. Over a space of two generations in a city containing thirty thousand free men, enough literary and artistic genius of the first rank arose to supply a nation of millions for a century under ordinary circumstances. I'm referring to the Athens of Pericles.

"There are other examples. There is the Florence of the Medicis, the England of Elizabeth, the Spain of the Cordovan Emirs. There was the spasm of social reformers among the Israelites of the Eighth and Seventh centuries before Christ. Do you know what I mean?"

Blaustein nodded, "I see that history is a subject that interests you."

"Why not? I suppose there's nothing that says I must restrict myself to nuclear cross-sections and wave mechanics."

"Nothing at all. Please proceed."

"At first, I thought I could learn more of the true inwardness of historical cycles by consulting a specialist. I had some conferences with a professional historian. A waste of time!"

"What was his name; this professional historian?"

"Does it matter?"

"Perhaps not, if you would rather consider it confidential. What did he tell you?"

"He said I was wrong; that history only appeared to go in spasms. He said that after closer studies the great civilizations of Egypt and Sumeria did not arise suddenly or out of nothing, but upon the basis of a long-developing subcivilization that was already sophisticated in its arts. He said that Periclean Athens built upon a pre-Periclean Athens of lower accomplishments, without which the age of Pericles could not have been.

"I asked why was there not a post-Periclean Athens of higher accomplishments still, and he told me that Athens was ruined by a plague and by a long war with Sparta. I asked about other cultural spurts and each time it was a war that

ended it, or, in some cases, even accompanied it. He was like all the rest. The truth was there; he had only to bend and pick it up; but he didn't."

Ralson stared at the floor, and said in a tired voice, "They come to me in the laboratory sometimes, doctor. They say, 'How the devil are we going to get rid of the such-and-such effect that is ruining all our measurements, Ralson?' They show me the instruments and the wiring diagrams and I say, 'It's staring at you. Why don't you do so-and-so? A child could tell you that.' Then I walk away because I can't endure the slow puzzling of their stupid faces. Later, they come to me and say, 'It worked, Ralson. How did you figure it out?' I can't explain to them, doctor; it would be like explaining that water is wet. And I couldn't explain to the historian. And I can't explain to you. It's a waste of time."

"Would you like to go back to your room?"

"Yes."

Blaustein sat and wondered for many minutes after Ralson had been escorted out of his office. His fingers found their way automatically into the upper right drawer of his desk and lifted out the letter-opener. He twiddled it in his fingers.

Finally, he lifted the telephone, and dialed the unlisted number he had been given.

He said, "This is Blaustein. There is a professional historian who was consulted by Dr. Ralson some time in the past, probably a bit over a year ago. I don't know his name. I don't even know if he was connected with a University. If you could find him; I would like to see him."

Thaddeus Milton, Ph.D. blinked thoughtfully at Blaustein and brushed his hand through his iron-gray hair. He said, "They came to me and I said that I had indeed met this man. However, I have had very little connection with him. None, in fact, beyond a few conversations of a professional nature."

"How did he come to you?"

"He wrote me a letter; why me, rather than someone else, I do not know. A series of articles written by myself had appeared in one of the semilearned journals of semipopular appeal about that time. It may have attracted his attention."

"I see. With what general topic were the articles concerned?"

"They were a consideration of the validity of the cyclic approach to history. That is, whether one can really say that a particular civilization must follow laws of growth and decline in any matter analogous to those involving individuals."

"I have read Toynbee, Dr. Milton."

"Well, then, you know what I mean."

Blaustein said, "And when Dr. Ralson consulted you, was it with reference to this cyclic approach to history?"

"U-m-m-m. In a way, I suppose.

Of course, the man is not an historian and some of his notions about cultural trends are rather dramatic and . . . what shall I say . . . tabloidish. Pardon me, doctor, if I ask a question which may be improper. Is Dr. Ralson one of your patients?"

"Dr. Ralson is not well and is in my care. This, and all else we say here, is confidential, of course."

"Quite. I understand that. However, your answer explains something to me. Some of his ideas almost verged on the irrational. He was always worried, it seemed to me, about the connection between what he called 'cultural spurts' and calamities of one sort or another. Now such connections have been noted frequently. The time of a nation's greatest vitality may come at a time of great national insecurity. The Netherlands is a good case in point. Its great artists, statesmen and explorers belong to the early Seventeenth Century at the time when she was locked in a death struggle with the greatest European power of the time, Spain. When at the point of destruction at home, she was building an empire in the Far East and had secured footholds on the northern coast of South America, the southern tip of Africa, and the Hudson Valley of North America. Her fleets fought England to a standstill. And then, once her political safety was assured, she declined.

"Well, as I say, that is not unusual. Groups, like individuals, will rise to strange heights in answer to a challenge, and vegetate in the absence of a challenge. Where Dr. Ralson left the paths of sanity, however, was in insisting that such a view amounted to confusing cause and effect. He declared that it was not times of war and danger that stimulated 'cultural spurts,' but rather vice versa. He claimed that each time a group of men showed too much vitality and ability, a war became necessary to destroy the possibility of their further development."

"I see," said Blaustein.

"I rather laughed at him, I am afraid. It may be that that was why he did not keep the last appointment we made. Just toward the end of the last conference he asked me, in the most intense fashion imaginable, whether I did not think it queer that such an improbable species as Man was dominant on Earth, when all he had in his favor was intelligence. There I laughed aloud. Perhaps I should not have, poor fellow."

"It was a natural reaction," said Blaustein, "but I must take no more of your time. You have been most helpful."

They shook hands, and Thaddeus Milton took his leave.

"Well," said Darrity, "there are your figures on the recent suicides among scientific personnel. Get any deductions out of it?"

"I should be asking you that," said Blaustein, gently. "The F.B.I. must have investigated thoroughly."

"You can bet the national debt on

that. They *are* suicides. There's no mistake about it. There have been people checking on it in another department. The rate is about four times above normal, taking age, social status, economic class into consideration."

"What about British scientists?"

"Just about the same."

"And the Soviet Union?"

"Who can tell?" The investigator leaned forward, "Doc, you don't think the Soviets have some sort of ray that can make people want to commit suicide, do you? It's sort of suspicious that men in atomic research are the only ones affected."

"Is it? Perhaps not. Nuclear physicists may have peculiar strains imposed upon them. It is difficult to tell without thorough study."

"You mean complexes might be coming through," asked Darrity, warily.

Blaustein made a face, "Psychiatry is becoming too popular. Everybody talks of complexes and neuroses and psychoses and compulsions and what-not. One man's guilt complex is another man's good night's sleep. If I could talk to each one of the men who committed suicide, maybe I could know something."

"You're talking to Ralson."

"Yes, I'm talking to Ralson."

"Has *he* got a guilt complex?"

"Not particularly. He has a background out of which it would not surprise me if he obtained a morbid concern with death. When he was twelve he saw his mother die under the wheels of an automobile. His father died slowly of cancer. Yet the effect of that on his present troubles is not clear."

Darrity picked up his hat, "Well, I wish you'd get a move on, doc. There's something big on, bigger than the H-Bomb. I don't know how anything *can* be bigger than that, but it is."

Ralson insisted on standing, "I had a bad night last night, doctor."

"I hope," said Blaustein, "these conferences are not disturbing you."

"Well, maybe they are. It has me thinking on the subject again. It also makes things bad, when I do that. How do you imagine it feels being part of a bacterial culture, doctor?"

"I had never thought of that. To a bacterium, it probably feels quite normal."

Ralson did not hear. He said, slowly, "A culture in which intelligence is being studied. We study all sorts of things as far as their genetic relationships are concerned. We take fruit flies and cross red eyes and white eyes to see what happens. We don't care anything about red eyes and white eyes, but we try to gather from them certain basic genetic principles. You see what I mean?"

"Certainly."

"Even in humans, we can follow various physical characteristics. There is the Hapsburg lip, and the hemophilia that started with Queen Victoria and cropped up in her de-

cendants among the Spanish and Russian royal families. We can even follow feeble-mindedness in the Jukes and Kallikaks. You learn about it in high-school biology. But you can't breed human beings the way you do fruit flies. Humans live too long. It would take centuries to draw conclusions. It's a pity we don't have a special race of men that reproduce at weekly intervals, eh?"

He waited for an answer, but Blaustein only smiled.

Ralson said, "Only that's exactly what we would be for another group of beings whose life span might be thousands of years. To them, we would reproduce rapidly enough. We would be short-lived creatures and they could study the genetics of such things as musical aptitude, scientific intelligence and so on. Not that those things would interest them as such, any more than the white eyes of the fruit fly interest us as white eyes."

"This is a very interesting notion," said Blaustein.

"It is not simply a notion. It is true. To me, it is obvious, and I don't care how it seems to you. Look around you. Look at the planet, Earth. What kind of a ridiculous animal are we to be lords of the world after the dinosaurs had failed. Sure, we're intelligent, but what's intelligence? We think it is important because we have it. If the Tyranosaurus could have picked out the one quality that he thought would ensure species domination, it would be size and strength. And he would make a better case for it. He lasted longer than we're likely to.

"Intelligence in itself isn't much as far as survival values are concerned. The elephant makes out very poorly indeed when compared to the sparrow even though he is much more intelligent. The dog does well, under man's protection, but not as well as the housefly against whom every human hand is raised. Or take the primates as a group. The small ones cower before their enemies; the large ones have always been remarkably unsuccessful in doing more than barely holding their own. The baboons do the best and that is because of their canines, not their brains."

A light film of perspiration covered Ralson's forehead, "And one can see that man has been tailored, made to careful specifications for those things that study us. Generally, the primate is short-lived. Naturally, the larger ones live longer, which is a fairly general rule in animal life. Yet the human being has a life span twice as long as any of the other great apes; considerably longer even than the gorilla that outweighs him. We mature later. It's as though we've been carefully bred to live a little longer so that our life cycle might be more of a convenient length."

He jumped to his feet, shaking his fists above his head, "A thousand years is a day—"

Blaustein punched a button hastily.

For a moment, Ralson struggled against the white-coated orderly who entered, and then he allowed himself to be led away.

Blaustein looked after him, shook his head, and picked up the telephone.

He got Darrity, "Inspector, you may as well know that this may take a long time."

He listened and shook his head, "I know. I don't minimize the urgency."

The voice in the receiver was tinny and harsh, "Doctor, you *are* minimizing it. I'll send Dr. Grant to you. He'll explain the situation to you."

Dr. Grant asked how Ralson was, then asked somewhat wistfully if he could see him. Blaustein shook his head gently.

Grant said, "I've been directed to explain the current situation in atomic research to you."

"So that I will understand, no?"

"I hope so. It's a measure of desperation. I'll have to remind you—"

"Not to breathe a word of it. Yes, I know. This insecurity on the part of you people is a very bad symptom. You must know these things cannot be hidden."

"You live with secrecy. It's contagious."

"Exactly. What is the current secret?"

"There is . . . or, at least, there might be a defense against the atomic bomb."

"And that is a secret? It would be better it should be shouted to all the people of the world instantly."

"For Heaven's sake, no. Listen to me, Dr. Blaustein. It's only on paper so far. It's at the E equals mc square stage, almost. It may not be practical. It would be bad to raise hopes we would have to disappoint. On the other hand, if it were known that we *almost* had a defense, there *might be* a desire to start and win a war before the defense were completely developed."

"That I don't believe. Wars are not started; they happen. But, nevertheless, I distract you. What is the nature of this defense, or have you told me as much as you dare?"

"No, I can go as far as I like; as far as is necessary to convince you we have to have Ralson—and fast!"

"Well, then tell me, and I, too, will know secrets. I'll feel like a member of the Cabinet."

"You'll know more than most. Look, Dr. Blaustein, let me explain it in lay language. So far, military advances have been made fairly equally in both offensive and defensive weapons. Once before there seemed to be a definite and permanent tipping of all warfare in the direction of the offense, and that was with the invention of gunpowder. But the defense caught up. The medieval man-in-armor-on-horse became the modern man-in-tank-on-treads, and the stone castle became the concrete pillbox. The same thing, you see, except that everything has been boosted several orders of magnitude."

"Very good. You make it clear. But with the atomic bomb comes more orders of magnitude, no? You must go past concrete and steel for protection."

"Right. Only we can't just make thicker and thicker walls. We've run out of materials that are strong enough. So we must abandon materials altogether. If the atom attacks, we must let the atom defend. We will use energy itself; a force field."

"And what," asked Blaustein, gently, "is a force field?"

"I wish I could tell you. Right now, it's an equation on paper. Energy can be so channeled as to create a wall of matterless inertia, theoretically. In practice, we don't know how to do it."

"It would be a wall you could not go through, is that it? Even for atoms?"

"Even for atom bombs. The only limit on its strength would be the amount of energy we could pour into it. It could even theoretically be made to be impermeable to radiation. It would bounce off the gamma rays. What we're dreaming of is a screen that would be in permanent place about cities; at minimum strength, using practically no energy. It could then be triggered to maximum intensity in a fraction of a millisecond at the impingement of short-wave radiation; say the amount radiating from a mass of plutonium large enough to be an atomic war head. All this is theoretically possible."

"And why must you have Ralson?"

"Because he is the only one who can reduce it to practice, if it can be made practical at all, quickly enough. Every minute counts these days. You know what the international situation is like. Atomic defense *must* arrive before atomic war."

"You are so sure of Ralson?"

"I am as sure of him as I can be of anything. The man is amazing, Dr. Blaustein. He is always right. Nobody in the field knows how he does it."

"A sort of intuition, no?" The psychiatrist looked disturbed, "A kind of reasoning that goes beyond ordinary human capacities. Is that it?"

"I make no pretense of knowing what it is."

"Let me speak to him once more, then. I will let you know."

"Good." Grant rose to leave; then, as if in afterthought, he said, "I might say, doctor, that if you don't do something, the Commission plans to take Dr. Ralson out of your hands."

"And try another psychiatrist? If they wish to do that, of course, I will not stand in their way. It is my opinion, however, that no reputable practitioner will pretend there is a rapid cure."

"We may not intend further mental treatment. He may simply be returned to work."

"That, Dr. Grant, I will fight. You will get nothing out of him. It will be his death."

"We get nothing out of him anyway."

"This way there is at least a chance, no?"

"I hope so. And by the way, please don't mention the fact that I said anything about taking Ralson away."

"I will not, and I thank you for the warning. Good-by, Dr. Grant."

"I made a fool of myself last time, didn't I, doctor?" said Ralson. He was frowning.

"You mean you don't believe what you said then?"

"I do!" Ralson's slight form trembled with the intensity of his affirmation.

He rushed to the window, and Blaustein swiveled in his chair to keep him in view. There were bars in the window. He couldn't jump. The glass was unbreakable.

Twilight was ending, and the stars were beginning to come out. Ralson stared at them in fascination, then he turned to Blaustein and flung a finger outward, "Every single one of them is an incubator. They maintain temperatures at the desired point. Different experiments; different temperatures. And the planets that circle them are just huge cultures, containing different nutrient mixtures and different life forms. The experimenters are economical, too—whatever and whoever they are. They've cultured many types of life forms in this particular test tube. Dinosaurs in a moist, tropical age and ourselves among the glaciers. They turn the sun up and down and we try to work out the physics of it. Physics!" He drew his lips back in a snarl.

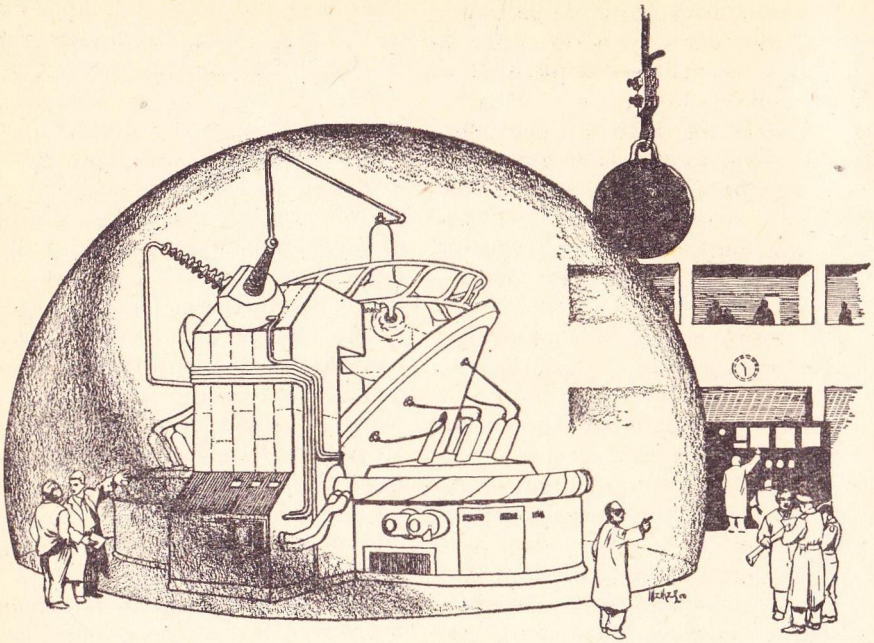
"Surely," said Dr. Blaustein, "it is not possible that the sun can be turned up and down at will."

"Why not? It's just like a heating element in an oven. You think bacteria know what it is that works the heat that reaches them? Who knows? Maybe they evolve theories, too. Maybe they have their cosmogonies about cosmic catastrophes, in which clashing light-bulbs create strings of Petri dishes. Maybe they think there must be some beneficent creator that supplies them with food and warmth and says to them, 'Be fruitful and multiply!'

"We breed like them, not knowing why. We obey the so-called laws of Nature which are only our interpretation of the not-understood forces imposed upon us.

"And now they've got the biggest experiment of any yet on their hands. It's been going on for two hundred years. They decided to develop a strain for mechanical aptitude in England in the seventeen hundreds, I imagine. We call it the Industrial Revolution. It began with steam, went on to electricity, then atoms. It was an interesting experiment, but they took their chances on letting it spread. Which is why they'll have to be very drastic indeed in ending it."

Blaustein said, "And how would they plan to end it? Do you have an idea about that?"



"You ask *me* how they plan to end it. You can look about the world today and still ask what is likely to bring our technological age to an end. All the Earth fears an atomic war and would do anything to avoid it; yet all the Earth fears that an atomic war is inevitable."

"In other words, the experimenters will arrange an atom war whether we want it or not, to kill off the technological era we are in, and to start fresh. That is it, no?"

"Yes. It's logical. When we sterilize an instrument, do the germs know where the killing heat comes from? Or what has brought it about? There is some way the experimenters can raise the heat of our emotions; some way they can handle us that passes our understanding."

"Tell me," said Blaustein, "is that why you want to die? Because you think the destruction of civilization is coming and can't be stopped?"

Ralson said, "I *don't* want to die. It's just that I must." His eyes were tortured, "Doctor, if you had a culture of germs that were highly dangerous and that you had to keep under absolute control, might you not have an agar medium impregnated with, say, penicillin, in a circle at a certain distance from the center of inoculation? Any germs spreading out too far from that center would die. You would have nothing against the particular germs who

were killed; you might not even know that any germs had spread that far in the first place. It would be purely automatic.

"Doctor, there is a penicillin ring about our intellects. When we stray too far; when we penetrate the true meaning of our own existence, we have reached into the pencillin and we must die. It works slowly—but it's hard to stay alive."

He smiled briefly and sadly. Then he said, "May I go back to my room now, doctor?"

Dr. Blaustein went to Ralson's room about noon the next day. It was a small room and featureless. The walls were gray with padding. Two small windows were high up and could not be reached. The mattress lay directly on the padded floor. There was nothing of metal in the room; nothing that could be utilized in tearing life from body. Even Ralson's nails were clipped short.

Ralson sat up, "Hello!"

"Hello, Dr. Ralson. May I speak to you?"

"Here? There isn't any seat I can offer you."

"It is all right. I'll stand. I have a sitting job and it is good for my sitting-down place that I should stand sometimes. Dr. Ralson, I have thought all night of what you told me yesterday and in the days before."

"And now you are going to apply treatment to rid me of what you think are delusions."

"No. It is just that I wish to ask questions and perhaps to point out some consequences of your theories which . . . you will forgive me? . . . you may not have thought of."

"Oh?"

"You see, Dr. Ralson, since you have explained your theories, I, too, know what you know. Yet I have no feeling about suicide."

"Belief is more than something intellectual, doctor. You'd have to believe this with all your insides, which you don't."

"Do you not think perhaps it is rather a phenomenon of adaptation?"

"How do you mean?"

"You are not really a biologist, Dr. Ralson. And although you are very brilliant indeed in physics, you do not think of everything with respect to these bacterial cultures you use as analogies. You know that it is possible to breed bacterial strains that are resistant to penicillin or to almost any bacterial poison."

"Well?"

"The experimenters who breed us have been working with humanity for many generations, no? And this particular strain which they have been culturing for two centuries shows no signs of drying out spontaneously. Rather, it is a vigorous strain and a very infective one. Older high-culture strains were confined to single cities or to small areas and lasted only a generation or two. This one is spreading throughout the world. It is a *very* infective strain. Do you not think it

may have developed pencillin immunity? In other words, the methods the experimenters use to wipe out the culture may not work too well any more, no?"

Ralson shook his head, "It's working on me."

"You are perhaps nonresistant. Or you have stumbled into a very high concentration of penicillin indeed. Consider all the people who have been trying to outlaw atomic warfare and to establish some form of world government and lasting peace. The effort has risen in recent years, without too awful results."

"It isn't stopping the atomic war that's coming."

"No, but maybe only a little more effort is all that is required. The peace-advocates do not kill themselves. More and more humans are immune to the experimenters. Do you know what they are doing in the laboratory?"

"I don't want to know."

"You *must* know. They are trying to invent a force field that will stop the atom bomb. Dr. Ralson, if I am culturing a virulent and pathological bacterium; then, even with all precautions, it may sometimes happen that I will start a plague. We may be bacteria to them, but we are dangerous to them, also, or they wouldn't wipe us out so carefully after each experiment.

"They are not quick, no? To them a thousand years is as a day, no? By the time they realize we are out of the culture, past the pencillin, it will be too late for them to stop us. They have brought us to the atom, and if we can only prevent ourselves from using it upon one another, we may turn out to be too much even for the experimenters."

Ralson rose to his feet. Small though he was, he was an inch and a half taller than Blaustein, "They are really working on a force field?"

"They are trying to. But they need you."

"No. I can't."

"They must have you in order that you might see what is so obvious to you. It is not obvious to them. Remember, it is your help, or else—defeat of man by the experimenters."

Ralson took a few rapid steps away, staring into the blank, padded wall. He muttered, "But there must be that defeat. If they build a force field, it will mean death for all of them before it can be completed."

"Some or all of them may be immune, no? And in any case, it will be death for them anyhow. They are trying."

Ralson said, "I'll try to help them."

"Do you still want to kill yourself?"

"Yes."

"But you'll try not to, no?"

"I'll *try* not to, doctor." His lip quivered. "I'll have to be watched."

Blaustein climbed the stairs and presented his pass to the guard in the lobby. He had already been inspected at the outer gate, but he, his

pass, and its signature were now scrutinized once again. After a moment, the guard retired to his little cubby and made a phone call. The answer satisfied him. Blaustein took a seat and, in half a minute, was up again, shaking hands with Dr. Grant.

"The President of the United States would have trouble getting in here, no?" said Blaustein.

The lanky physicist smiled, "You're right, if he came without warning."

They took an elevator which traveled twelve floors. The office to which Grant led the way had windows in three directions. It was soundproofed and air-conditioned. Its walnut furniture was in a state of high polish.

Blaustein said, "My goodness. It is like the office of the chairman of a board of directors. Science is becoming big business."

Grant looked embarrassed, "Yes, I know, but government money flows easily and it is difficult to persuade a congressman that your work is important unless he can see, smell, and touch the surface shine."

Blaustein sat down and felt the upholstered seat give way slowly. He said, "Dr. Elwood Ralson has agreed to return to work."

"Wonderful. I was hoping you would say that. I was hoping that was why you wanted to see me." As though inspired by the news, Grant offered the psychiatrist a cigar, which was refused.

"However," said Blaustein, "he remains a very sick man. He will have to be treated carefully and with insight."

"Of course. Naturally."

"It's not quite as simple as you may think. I want to tell you something of Ralson's problems, so that you will really understand how delicate the situation is."

He went on talking and Grant listened first in concern, and then in astonishment. "But then the man is out of his head, Dr. Blaustein. He'll be of no use to us. He's crazy."

Blaustein shrugged, "It depends on how you define 'crazy.' It's a bad word; don't use it. He has delusions, certainly. Whether they will affect his peculiar talents one cannot know."

"But surely no sane man could possibly—"

"Please. Please. Let us not launch into long discussions on psychiatric definitions of sanity and so on. The man has delusions and, ordinarily, I would dismiss them from all consideration. It is just that I have been given to understand that the man's particular ability lies in his manner of proceeding to the solution of a problem by what seems to be outside ordinary reason. That is so, no?"

"Yes. That *must* be admitted."

"And other scientists here?"

"How can you and I judge then as to the worth of one of his conclusions. Let me ask you, do *you* have suicidal impulses lately?"

"I don't think so."

"No, of course not."

"I would suggest, however, that

while research on the force field proceeds, the scientists concerned be watched here and at home. It might even be a good enough idea that they should not go home. Offices like these could be arranged to be a small dormitory—"

"Sleep at work. You would never get them to agree."

"Oh, yes. If you do not tell them the real reason but say it is for security purposes, they will agree. 'Security purposes' is a wonderful phrase these days, no? Ralson must be watched more than any one."

"Of course."

"But all this is minor. It is something to be done to satisfy my conscience in case Ralson's theories are correct. Actually, I don't believe them. They *are* delusions, but once that is granted, it is necessary to ask what the causes of those delusions are. What is it in Ralson's mind, in his background, in his life that makes it so necessary for him to have these particular delusions? One cannot answer that simply. It may well take years of constant psychoanalysis to discover the answer. And until the answer is discovered, he will not be cured.

"But, meanwhile, we can perhaps make intelligent guesses. He has had an unhappy childhood, which, in one way or another, has brought him face to face with death in very unpleasant fashion. In addition, he has never been able to form associations with other children, or, as he grew older, with other men. He was always impatient with their slower forms of reasoning. Whatever difference there is between his mind and that of others, it has built a wall between him and society as strong as the force field you are trying to design. For similar reasons, he has been unable to enjoy a normal sex life. He has never married; he has had no sweethearts.

"It is easy to see that he could easily compensate to himself for this failure to be accepted by his social milieu by taking refuge in the thought that other human beings are inferior to himself. Which is, of course, true, as far as mentality is concerned. There are, of course, many, many facets to the human personality and in not all of them is he superior. No one is. Others, then, who are more prone to see merely what is inferior, just as he himself is, would not accept his affected preeminence of position. They would think him queer, even laughable, which would make it even more important to Ralson to prove how miserable and inferior the human species was. How could he better do that than to show that mankind was simply a form of bacteria to other superior creatures which experiment upon them. And then his impulses to suicide would be a wild desire to break away completely from being a man at all; to stop this identification with the miserable species he has created in his mind. You see?"

Grant nodded, "Poor guy."

"Yes, it is a pity. Had he been properly taken care of in childhood—

Well, it is best for Dr. Grant that he have no contact with any of the other men here. He is too sick to be trusted with them. You, yourself, must arrange to be the only man who will see him or speak to him. Dr. Ralson has agreed to that. He apparently thinks you are not as stupid as some of the others."

Grant smiled faintly, "That is agreeable to me."

"You will, of course, be careful. I would not discuss anything with him but his work. If he should volunteer information about his theories, which I doubt, confine yourself to something noncommittal, and leave. And at all times, keep away anything that is sharp and pointed. Do not let him reach a window. Try to have his hands kept in view. You understand. I leave my patient in your care, Dr. Grant."

"I will do my best, Dr. Blaustein."

For two months, Ralson lived in a corner of Grant's office, and Grant lived with him. Gridwork had been built up before the windows; wooden furniture was removed and upholstered sofas brought in. Ralson did his thinking on the couch and his calculating on a desk pad atop a hassock.

The "Do Not Enter" was a permanent fixture outside the office. Meals were left outside. The adjoining men's room was marked off for private use and the door between it and the office removed. Grant switched to an electric razor. He made certain that Ralson took sleeping pills each night and waited till the other slept before sleeping himself.

And always reports were brought to Ralson. He read them while Grant watched and tried to seem not to watch.

Then Ralson would let them drop and stare at the ceiling, with one hand shading his eyes.

"Anything?" asked Grant.

Ralson shook his head from side to side.

Grant said, "Look, I'll clear the building during the swing shift. It's important that you see some of the experimental jigs we've been setting up."

They did so, wandering through the lighted, empty buildings like drifting ghosts, hand in hand. Always hand in hand. Grant's grip was tight. But after each trip, Ralson would still shake his head from side to side.

Half a dozen times he would begin writing; each time there would be a few scrawls, and then he would kick the hassock over on its side.

Until, finally, he began writing once again and covered half a page rapidly. Automatically, Grant approached. Ralson looked up, covering the sheet of paper with a trembling hand.

He said, "Call Blaustein."

"What?"

"I said, call Blaustein. Get him here. Now!"

Grant moved to the telephone.

Ralson was writing rapidly now,

stopping only to brush wildly at his forehead with the back of a hand. It came away wet.

He looked up and his voice was cracked, "Is he coming?"

Grant looked worried, "He isn't at his office."

"Get him at his home. Get him wherever he is. *Use* that telephone. Don't play with it."

Grant used it; and Ralson pulled another sheet toward himself.

Five minutes later, Grant said, "He's coming. What's wrong? You're looking sick."

Ralson could speak only thickly, "No time— Can't talk—"

He was writing, scribbling, scrawling, shakily diagramming. It was as though he were driving his hands, fighting it.

"Dictate!" urged Grant. "I'll write."

Ralson shook him off. His words were unintelligible. He held his right wrist with his other hand, shoving it as though it were a piece of wood, and then he collapsed over the papers.

Grant edged them out from under and laid Ralson down on the couch. He hovered over him restlessly and hopelessly until Blaustein arrived.

Blaustein took one look, "What happened?"

Grant said, "I think he's alive," but by that time Blaustein had verified that for himself, and Grant told him what had happened.

Blaustein used a hypodermic and they waited. Ralson's eyes were blank when they opened. He moaned.

Blaustein leaned close, "Ralson."

Ralson's hands reached out blindly and clutched at the psychiatrist, "Doc. Take me back."

"I will. Now. It is that you have the force field worked out, no?"

"It's on the papers. Grant, it's on the papers."

Grant had them and was leafing through them dubiously. Ralson said, weakly, "It's not *all* there. It's all I can write. You'll *have* to make it out of that. Take me back, doc!"

"Wait," said Grant. He whispered urgently to Blaustein, "Can't you leave him here till we test this thing? I can't make out what most of this is. The writing is illegible. Ask him what makes him think this will work."

"Ask *him?*" said Blaustein, gently. "Isn't he the one who always knows?"

"Ask me, anyway," said Ralson, overhearing from where he lay on the couch. His eyes were suddenly wide and blazing.

They turned to him.

He said, "*They* don't want a force field. *They!* The experimenters! As long as I had no true grasp, things remained as they were. But I hadn't followed up that thought — *that* thought which is there in the papers —I hadn't followed it up for thirty seconds before I felt . . . I felt— Doctor—"

Blaustein said, "What is it?"

Ralson was whispering again, "I'm deeper in the penicillin. I could feel myself plunging in and in, the further I went with that. I've

never been in . . . so deep. That's how I knew I was right. Take me away."

Blaustein straightened, "I'll have to take him away, Grant. There's no alternative. If you can make out what he's written, that's it. If you can't make it out, I can't help you. That man can do no more work in his field without dying, do you understand?"

"But," said Grant, "he's dying of something imaginary."

"All right. Say that he is. But he will be really dead just the same, no?"

Ralson was unconscious again and heard nothing of this. Grant looked at him somberly, then said, "Well, take him away, then."

Ten of the top men at the Institute watched glumly as slide after slide filled the illuminated screen. Grant faced them, expression hard and frowning.

He said, "I think the idea is simple enough. You're mathematicians and you're engineers. The scrawl may seem illegible, but it was done with meaning behind it. That meaning must somehow remain in the writing, distorted though it is. The first page is clear enough. It should be a good lead. Each one of you will look at every page over and over again. You're going to put down every possible version of each page as it seems it might be. You will work independently. I want no consultations."

One of them said, "How do you know it means *anything,* Grant?"

"Because those are Ralson's notes."

"*Ralson!* I thought he was—"

"You thought he was sick," said Grant. He had to shout over the rising hum of conversation. "I know. He is. That's the writing of a man who was nearly dead. It's all we'll ever get from Ralson, any more. Somewhere in that scrawl is the answer to the force field problem. If we can't find it, we may have to spend ten years looking for it elsewhere."

They bent to their work. The night passed. Two nights passed. Three nights—

Grant looked at the results. He shook his head, "I'll take your word for it that it is all self-consistent. I can't say I understand it."

Lowe, who, in the absence of Ralson, would readily have been rated the best nuclear engineer at the Institute, shrugged, "It's not exactly clear to me. If it works, he hasn't explained why."

"He had no time to explain. Can you build the generator as he describes it?"

"I could try."

"Would you look at all the other versions of the pages?"

"The others are definitely not self-consistent."

"Would you double-check?"

"Sure."

"And could you start construction anyway?"

"I'll get the shop started. But I

tell you frankly that I'm pessimistic."

"I know. So am I."

The thing grew. Hal Ross, Senior Mechanic, was put in charge of the actual construction, and he stopped sleeping. At any hour of the day or night, he could be found at it, scratching his bald head.

He asked questions only once, "What is it, Dr. Lowe? Never saw anything like it? What's it supposed to do?"

Lowe said, "You know where you are, Ross. You know we don't ask questions here. Don't ask again."

Lowe did not ask again. He was known to dislike the structure that was being built. He called it ugly and unnatural. But he stayed at it.

Blaustein called one day.

Grant said, "How's Ralson?"

"Not good. He wants to attend the testing of the Field Projector he designed."

Grant hesitated, "I suppose we should. It's his after all."

"I would have to come with him."

Grant looked unhappier, "It might be dangerous, you know. Even in a pilot test, we'd be playing with tremendous energies."

Blaustein said, "No more dangerous for us than for you."

"Very well. The list of observers will have to be cleared through the Commission and the F.B.I., but I'll put you in."

Blaustein looked about him. The Field Projector squatted in the very center of the huge testing laboratory, but all else had been cleared. There was no visible connection with the plutonium pile which served as energy-source, but from what the psychiatrist heard in scraps about him—he knew better than to ask Ralson—the connection was from beneath.

At first, the observers had circled the machine, talking in incomprehensibles, but they were drifting away now. The gallery was filling up. There were at least three men in generals' uniforms on the other side, and a real coterie of lower-scale military. Blaustein chose an unoccupied portion of the railing; for Ralson's sake, most of all.

He said, "Do you still think you would like to stay?"

It was warm enough within the laboratory, but Ralson was in his coat, with his collar turned up. It made little difference, Blaustein felt. He doubted that any of Ralson's former acquaintances would now recognize him.

Ralson said, "I'll stay."

Blaustein was pleased. He wanted to see the test. He turned again at a new voice.

"Hello, Dr. Blaustein."

For a minute, Blaustein did not place him, then he said, "Ah, Inspector Darrity. What are you doing here?"

"Just what you would suppose." He indicated the watchers, "There isn't any way you can weed them out so that you can be sure there won't

be any mistakes. I once stood as near to Klaus Fuchs as I am standing to you." He tossed his pocketknife into the air and retrieved it with a dexterous motion.

"Ah, yes. Where shall one find perfect security? What man can trust even his own unconsciousness? And you will now stand near to me, no?"

"Might as well." Darrity smiled, "You were very anxious to get in here, weren't you?"

"Not for myself, inspector. And would you put away the knife, please."

Darrity turned in surprise in the direction of Blaustein's gentle head-gesture. He put his knife away and looked at Blaustein's companion for the second time. He whistled softly.

He said, "Hello, Dr. Ralson."

Ralson croaked, "Hello."

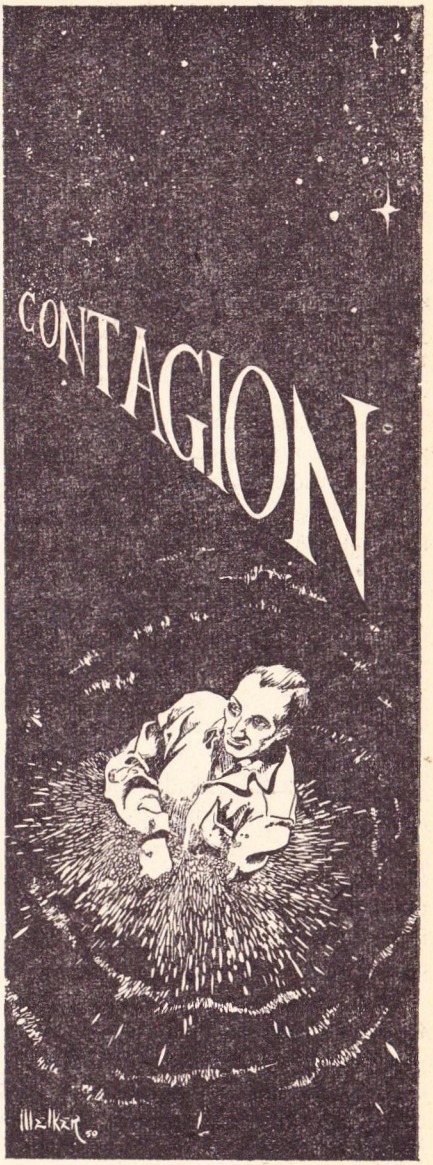
Blaustein was not surprised at Darrity's reaction. Ralson had lost twenty pounds since returning to the sanitarium. His face was yellow and wrinkled; the face of a man who had suddenly become sixty.

Blaustein said, "Will the test be starting soon?"

Darrity said, "It looks as if they're starting now."

He turned and leaned on the rail. Blaustein took Ralson's elbow and began leading him away, but Darrity said, softly, "Stay here, doc. I don't want you wandering about."

Blaustein looked across the laboratory. Men were standing about with the uncomfortable air of having turned half to stone. He could



recognize Grant, tall and gaunt, moving his hand slowly to light a cigarette, then changing his mind and putting lighter and cigarette in his pocket. The young men at the control panels waited tensely.

Then there was a low humming and the faint smell of ozone filled the air.

Ralson said, harshly, "Look!"

Blaustein and Darrity looked along the pointing finger. The Projector seemed to flicker. It was as though there were heated air rising between it and them.

An iron ball came swinging down pendulum fashion and passed through the flickering area.

"It slowed up, no?" said Blaustein, excitedly.

Ralson nodded, "They're measuring the height of rise on the other side to calculate the loss of momentum. Fools! I *said* it would work." He was speaking with obvious difficulty.

Blaustein said, "Just watch, Dr. Ralson. I would not allow myself to grow needlessly excited."

The pendulum was stopped in its swinging, drawn up. The flickering about the Projector became a little more intense and the iron sphere arced down once again.

Over and over again, and each time, the sphere's motion was slowed with more of a jerk. It made a clearly audible sound as it struck the flicker. And eventually, it *bounced*. First, soggily, as though it hit putty, and then ringingly, as though it hit steel, so that the noise filled the place.

They drew back the pendulum bob and used it no longer. The Projector could hardly be seen behind the haze that surrounded it.

Grant gave an order and the odor of ozone was suddenly sharp and pungent. There was a cry from the assembled observers; each one exclaiming to his neighbor. A dozen fingers were pointing.

Blaustein leaned over the railing, as excited as the rest. Where the Projector had been, there was now only a huge semiglobular mirror. It was perfectly and beautifully clear. He could see himself in it, a small man standing on a small balcony that curved up on each side. He could see the fluorescent lights reflected in spots of glowing illumination. It was wonderfully sharp.

He was shouting, "Look, Ralson. It is reflecting energy. It is reflecting light waves like a mirror. Ralson—"

He turned, "Ralson! Inspector, where is Ralson?"

"What?" Darrity whirled, "I haven't seen him."

He looked about, wildly, "Well, he won't get away. No way of getting out of here now. You take the other side." And then he clapped hand to thigh, fumbled for a moment in his pocket, and said, "My knife is gone."

Blaustein found him. He was inside the small office belonging to Hal Ross. It led off the balcony, but

under the circumstances, of course, it had been deserted. Ross himself was not even an observer. A senior mechanic need not observe. But his office would do very well for the final end of the long fight against suicide.

Blaustein stood in the doorway for a sick moment, then turned. He caught Darrity's eye as the latter emerged from a similiar office a hundred feet down the balcony. He beckoned, and Darrity came at a run—

Dr. Grant was trembling with excitement. He had taken two puffs at each of two cigarettes and trodden each underfoot thereafter. He was fumbling with the third now.

He was saying, "This is better than any of us could possibly have hoped. We'll have the gun-fire test tomorrow. I'm sure of the result now, but we've planned it; we'll go through with it. We'll skip the small arms and start with the bazooka levels. Or maybe not. It might be necessary to construct a special testing structure to take care of the ricocheting problem."

He discarded his third cigarette.

A general said, "We'd have to try a literal atom-bombing, of course."

"Naturally. Arrangements have already been made to build a mock-city at Eniwetok. We could build a generator on the spot and drop the bomb. There'd be animals inside."

"And you really think the Field in full power would hold the bomb?"

"It's not just that, general. There'd be no noticeable Field when the bomb is dropped. The radiation of the plutonium would have to energize the Field before explosion. As we did here in the last step. That's the essence of it all."

"You know," said a Princeton professor, "I see disadvantages, too. When the Field is on full, anything it protects is in total darkness, as far as the sun is concerned. Besides that, it strikes me that the enemy can adopt the practice of dropping harmless radioactive missiles to set off the Field at frequent intervals. It would have nuisance value and be a considerable drain on our Pile as well."

"Nuisances," said Grant, "can be survived. These difficulties will be met eventually, I'm sure, now that the main problem has been solved."

The British observer had worked his way toward Grant and was shaking hands. He said, "I feel better about London already. I cannot help but wish your government would allow me to see the complete plans. What I have seen strikes me as completely ingenious. It seems obvious now, of course, but how did anyone ever come to think of it?"

Grant smiled, "That question has been asked before with reference to Dr. Ralson's devices—"

He turned at the touch of a hand upon his shoulder, "Dr. Blaustein! I had nearly forgotten. Here, I want to talk to you."

He dragged the small psychiatrist to one side and hissed in his

ear, "Listen, can you persuade Ralson to be introduced to these people. This is his triumph."

Blaustein said, "Ralson is dead."

"What!"

"Can you leave these people for a time?"

"Yes . . . yes— Gentlemen, you will excuse me for a few minutes?"

He hurried off with Blaustein.

The Federal men had already taken over. Unobtrusively, they barred the doorway to Ross' office. Outside there were the milling crowd discussing the answer to Alamogordo that they had just witnessed. Inside, unknown to them, was the death of the answerer. The G-men barrier divided to allow Grant and Blaustein to enter. It closed behind them again.

For a moment, Grant raised the sheet. He said, "He looks peaceful."

"I would say—happy," said Blaustein.

Darrity said, colorlessly, "The suicide weapon was my own knife. It was my negligence; it will be reported as such."

"No, no," said Blaustein, "that would be useless. He was my patient and I am responsible. In any case, he would not have lived another week. Since he invented the Projector, he was a dying man."

Grant said, "How much of this has to be placed in the Federal files? Can't we forget all about his madness?"

"I'm afraid not, Dr. Grant," said Darrity.

"I have told him the whole story," said Blaustein, sadly.

Grant looked from one to the other, "I'll speak to the Director. I'll go to the President, if necessary. I don't see that there need be any mention of suicide or of madness. He'll get full publicity as inventor of the Field Projector. It's the least we can do for him." His teeth were gritting.

Blaustein said, "He left a note."

"A note?"

Darrity handed him a sheet of paper and said, "Suicides almost always do. This is one reason the doctor told me about what really killed Ralson."

The note was addressed to Blaustein and it went:

"The Projector works; I knew it would. The bargain is done. You've got it and you don't need me any more. So I'll go. You needn't worry about the human race, doc. You were right. They've bred us too long; they've taken too many chances. We're out of the culture now and they won't be able to stop us. I know. That's all I can say. I know."

He had signed his name quickly and then underneath there was one scrawled line, and it said:

"Provided enough men are penicillin-resistant."

Grant made a motion to crumple the paper, but Darrity held out a quick hand.

"For the record, doctor," he said.

Grant gave it to him and said,

"Poor Ralson! He died believing all that trash."

Blaustein nodded, "So he did. Ralson will be given a great funeral, I suppose, and the fact of his invention will be publicized without the madness and the suicide. But the government men will remain interested in his mad theories. They may not be so mad, no, Mr. Darrity?"

"That's ridiculous, doctor," said Grant. "There isn't a scientist on the job who has shown the least uneasiness about it at all."

"Tell him, Mr. Darrity," said Blaustein.

Darrity said, "There has been another suicide. No, no, none of the scientists. No one with a degree. It happened this morning, and we investigated because we thought it might have some connection with today's test. There didn't seem any, and we were going to keep it quiet till the test was over. Only now there seems to be a connection.

"The man who died was just a guy with a wife and three kids. No reason to die. No history of mental illness. He threw himself under a car. We have witnesses, and it's certain he did it on purpose. He didn't die right away and they got a doctor to him. He was horribly mangled, but his last words were, 'I feel much better now' and he died."

"But who was he?" cried Grant.

"Hal Ross. The guy who actually built the Projector. The guy whose office this is."

Blaustein walked to the window. The evening sky was darkening into starriness.

He said, "The man knew nothing about Ralson's views. He had never spoken to Ralson, Mr. Darrity tells me. Scientists are probably resistant as a whole. They must be or they are quickly driven out of the profession. Ralson was an exception, a penicillin-sensitive who insisted on remaining. You see what happened to him. But what about the others; those who have remained in walks of life where there is no constant weeding out of the sensitive ones. How much of humanity *is* penicillin-resistant?"

"You *believe* Ralson," asked Grant in horror.

"I don't really know."

Blaustein looked at the stars.

Incubators?

THE END

★ ★ ★ ★ ★


CARTIER

CRISIS BY EDWARD GRENDON

It's a serious problem for any race to accept or attempt communication with an alien race — a problem of seeing through the peculiarities of local culture to the true nature of the alien's thoughts and beliefs. But it can be done . . .

Illustrated by Cartier

By 1980 the balance had shifted. The progress of the physical sciences had by no means stopped, but it had slowed considerably. The social sciences, on the other hand, had moved ahead with unexpected speed. The integration between academic and therapeutic psychology had been the first step, the rest quickly followed. When the final *rapprochement* between psychoanalysis and neurology was made, there existed, for the first time, a comprehensive theory of behavior, not only of human and animal behavior, but for other—so far theoretical—nervous systems as well. Just as the mathematicians were able to postulate geometries which existed in no known universe when they were first devised, the psychologists were now able to postulate nonterran behavior systems. Saevolies, John. "The History of Thought in the Modern World," World Press, 1998.

Woodward looked at his graphs for the last time. They eliminated a few possibilities and indicated a good probability that three were valid. Some fifty-seven other vectors were possible, but not probable and in a very few minutes he had to recommend a definite course of action on the basis of them. A recommendation that was almost certain to be accepted.

Briefly he considered going over the protocols again and discarded the idea. If he had been able to get no more conclusive results with the aid of his entire staff, he would get none now. If only he had proof to back up the certainty he felt? Intuitively he was positive which possibility was the correct one; scientifically, he could prove nothing. He stood up, placed a file envelope under his arm and walked out to the coffee bar.

The council chairman called the meeting to order and waited until the four hundred delegates became quiet. When he spoke it was in a tired, quiet voice.

"At this special meeting, gentlemen, we will dispense with the minutes and the usual formalities. You all know our subject. We are here to

consider the 'Voice' as the aliens have come to be known. To recapitulate briefly, we first heard of them when most radio communication was interrupted thirty-six days ago. A voice speaking good English with a rather high-pitched tone broke in. It introduced itself as a visitor from a nearby star system without giving a precise location. It stated that with our permission an ambassador was to be sent to Earth to see if we were developed enough for intercourse with other highly developed races. It asked that this ambassador be allowed a visit of three weeks with a typical Earth family rather than being shown over the whole planet. Specifications were given as to the type of signal we should set up for landing purposes and the date of landing, if we wished to accede. That date is now two weeks off.

"We have had three separate teams working on an analysis of the message. The chief of each team will now tell you of his recommendation. They are Mr. Woodward of the International Psychological Association team; Mr. Jelfiffe of the team of The Society of Human Engineers; and Mr. Dever of the team of The Federation of Social Sciences. We recognize the difficulty of their task and the speculative nature of their results which are, however, the best we have, Mr. Dever."

The gangling weary man with the sensitive scholar's face, stood up at the right of the president.

"All we can make is a good guess. We believe the alien to possess a nervous system of Cantor's Class 4 type. This means an organism who acts warily, plans far in advance and is too rigid to do anything but retreat quickly or strike out spasmodically when its predictions are inaccurate. It would tend to have a strong ethical system applied to the ingroup and no concern with organisms not members of the ingroup. If frustrations imposed on it are expected it retreats; if unexpected, attacks. Since it will be unable to predict clearly the course of development of human beings it is more than liable to feel frustration and to become hostile and aggressive. We recommend refusal of permission to land and to signal that we will not be ready for relations with extra-terrestrial groups for at least one hundred years. The aliens almost certainly see this as a possible reply and are most likely to withdraw for that time. At the end of that period we can re-evaluate the situation."

He sat down and buried his face in his hands. Those who knew him realized what he had lost. Dever, who had sought after knowledge from childhood, who had spent his life at research, who had the most insatiable of all desires, the hunger to know, had given up the vast store of ideas and concepts the aliens would have provided. He had followed the logic of his science to its inexorable end and the result was bitter for him.

After a long minute the president said, "Mr. Jelfiffe" and Eli Jelfiffe stood up—a serious, intent man who

had made great contributions in the application of social science to the social system. A good speaker, his voice was clear and carried through the hall without the need for the microphone.

"We essentially, agree with Mr. Dever. Further we suggest a marked increase for research and training in both the physical and social sciences for the next fifty years. Class 4 organisms are very unlikely to get along well with human beings who are Class 9. Neither is basically stable enough in the face of their plans being thwarted. Contact between the two will result in frequent lapses of communication which must end in violent collision. Eventual contact is certain. Let us arm ourselves against that day."

Some men need freedom and peace, for themselves and for others. They work for it all their lives. Jelfiffe was such a man and the knowledge he was urging preparation for war rested more heavily on him than any of his hearers. His poise had been good and his speaking technique excellent, but his face was gray.

Woodward rose without waiting for an introduction. "We, in general, agree with the findings of the other two teams, but our recommendations are quite different."

He paused and waited for the murmur of surprise to die down. Jelfiffe and Dever were staring at him and the entire group waited tensely.

"We think we have detected slight variations from the Class 4 pattern which led us to believe that the alien is much more rigid and inflexible than it would appear from usual techniques of message analysis. We believe him to be an organism that lays long-range plans, checks them against empirical data a few times and then must follow them through. In other words if predictions are demonstrated valid in two or three checks, the alien is no longer structurally capable of abandoning the plan. However, if the plan does not predict on one of the checks; if the empirical data does not fit prediction curves, the alien will withdraw from the situation and feel real emotional blockage to again attacking this particular problem.

"Before going into the details of this, let me sketch the broad outlines of my recommendation. We let them land at a country estate we prepare. A family is there—a rather typical one—and a staff of servants. We have been going over psychographs for family and staff and submit as recommendations, Mr. Dever for gardener, Mr. Jelfiffe and his wife as the family, myself as cook. We also have other recommendations, but this is a matter of detail.

"In effect then, this is a Class 4 organism with several major differences. As Mr. Dever stated, it is probably empathic and co-operative with its ingroup, rather hostile with others. It makes plans far in advance, sets up prediction curves with a margin for error and checks those curves. If there is agreement with the data, it must follow through.

Further we believe its purpose here to be aggressive and probably exploitative in nature. There seems little chance that aliens and humans could get along together without violent clashes and probably war. We can however, possibly turn this situation into a not unprofitable course. "Now as to the details—"

The estate in Florida consisted of a large, low rambling house built around three sides of a court. The fourth side was a lawn which sloped down to a small lake some three hundred yards away. Beyond the lake, open fields stretched for nearly two miles. Some of the fields were newly planted and beginning to grow. Cows and sheep grazed in others. One very large field, about a mile from the house, was of hard packed earth which was torn up in several places as if small bombs had landed there. A tremendous target was whitewashed on the ground with the outermost circle fifty yards in diameter. A steel needle, twenty feet long, with fins on the large end, lay in the target. Beyond this field the hills began.

Behind the house were roads with a two-lane cement highway coming within a hundred yards of the house. A single track railroad paralleled the road and had a turntable at the end nearest the house. Off to the right stood barns, stables and servant quarters. The estate entirely filled the small but beautiful valley. It had stood for many years and there were now no signs of the furious labor that had gone into it in the past two weeks. The army of technicians had installed their equipment, tested it, and gone home. Only a "typical family" awaited the alien's ambassador.

The small sphere had detached itself from the large cylinder under the close scrutiny of various cameras, spectroscopes, telescopes, and other instruments. With no evidence of what was keeping it up showing, it floated and circled slowly down to the far end of the lawn. Once there, it opened up like a flower and became a flat platform on the ground. Two beings walked off the platform, the sides of it curled up and the reshaped sphere rose into the air and headed upward toward the cylinder.

They had the general body shape and size of Shetland ponies. A heavy bone carapace covered the neck and back. The head had a large brain case which changed the looks of the entire face. It had a human quality which probably came from both the bulging skull and the intelligent looking mobility of the face. A long flexible tentacle emerging from the base of the neck lay curled passively on the carapace of each. They stood quietly on the lawn looking toward the house, obviously waiting to be received.

Eli and Wendy Jelfiffe had come out of the house when the vehicle landed. They watched until the sphere was quite out of sight and then Eli lifted his wrist and spoke

into a small radio. Several minutes later a sleigh pulled by three oxen appeared from behind the barn. Driving it was Mr. Dever. In a few minutes Dever and the Jelfiffes had driven up to the ambassador's and dismounted from the sleigh. Behind them the tracks made by the heavy oak runners of the sleigh stretched across the lawn. Eli Jelfiffe moved forward and spoke: "It is a pleasure to welcome you. I am Jon Parsons and this is my wife; this is my gardener, Mr. Spencer. We have a place for you and are very glad you are staying with us. We have instructions to continue living as we normally do. You will be our guests. We have further instructions to answer no technical questions, but to allow you to inspect anything on the estate. Is that satisfactory?"

The heavier of the two aliens replied in the same formal tone, "My name is Inot and this is Kcid. We believe that the arrangement you state will be entirely acceptable. Food will be landed for us every three of your days and we do not require to eat oftener than that."

Jelfiffe raised his wrist to his mouth and spoke into it, "Cook, the aliens do not require food, you may discontinue preparations." Noticing the aliens' eyes on him he smiled and said, "Not knowing exactly what you ate, we were preparing a wide variety of foods for you to choose from. Our cook, Mr. Wis was making lists of the chemical constituents of each to help you decide." He took the reins, gestured his guests onto the broad flat back of the sleigh and turned the oxen back to the house.

Although it was only late afternoon, the sky was gray and a chill had begun to creep into the air. The house was brightly lit, the tall chimneys of the kerosene lamps blazed with a warm glow. Jelfiffe showed his guests to two large bare chambers on the ground floor. "If you will describe the furniture you would like in here, I can have it made and shipped in by rocket plane within a few hours. You can control the temperature in these rooms by means of those levers which connect with the atomic pile we use for heating. The small wheel at the base of each kerosene lamp controls the amount of illumination it gives off."

Kcid, who had been fingering with his tentacle the various controls mentioned, looked up from the kerosene lamp, "Why do you not use other power than this for light?"

Jelfiffe thought a moment. "I'm afraid that comes under the heading of technical questions. Now if you would care to look over the rest of the house? Oh, I forgot—furniture. We can transmit the designs to the factory as fast as you make or describe them."

"We will need some large heavy cloths—blankets or suchlike and you probably have enough of them here. We prefer to sleep on them rather than anything else. We would like to see the house. Tell me, we had understood most families had chil-

dren. We do not mean to be personal, but do you and your wife have any and where are they?"

"We have two boys of nineteen and twenty-two years," replied Jelfiffe. "Neither has been here for some time. The younger one is away at college. He should get his degree in electronics next year. The older is serving as a mercenary abroad—as a captain in a company of lancers. If his campaign goes well, he may get a short furlough and be permitted to come here and see you. But tell me, how did you learn English?"

Inot smiled. "Your radio waves are powerful and can be heard a good deal further than you probably imagine. Once we figured out that you were broadcasting in several languages we were able to analyze the most prevalent one. We could learn your language from it, but get no consistent picture of your world. So many different kinds of people—so many different techniques and motivations. So we came here to learn more about you."

"We are glad you came and within the limits of our instructions will help you as much as we can. Now let us show you around. Then we will eat. You may watch us, rest here, look through our library or watch our television. There are various programs and our butler will show you how to work the set."

While family and servants ate together, Jelfiffe and his wife at the upper table and the servants at the lower one below the salt, the aliens wandered around the house. They watched the eating for a while, not moving through the long grace, listened to the harpist play from his corner for a brief period and then went into the living room. They found five channels of the television operating; one showed a film about pirates, another a first world war battle. The third showed "Ben Hur," the fourth a Dr. Kildare film, and the fifth a science fantasy. In the typical manner of films, all apparently were set in the present. Occasional commercials featured such articles as electric razors, crossbows, aspirin, home permanent kits and magic love charms.

In the morning Jelfiffe and his wife told their guests their usual daily routine. "We generally do a little farming in the morning and sports in the afternoon, then a siesta and supper."

The aliens watched the routine for two weeks. Sometimes the gardener would sit on the terrace and operate the remote controlled farming machinery while Jelfiffe sweated with scythe or hoe in the fields. Sometimes Jelfiffe would sit at the small control box while the servants worked with rake or shovel. They saw Woodward open frozen food containers and cook them on the wood-burning range. Once a day the mail truck came speeding up the road, its jets leaving a long roar behind it. Every other day the supplies came in on the railroad behind the tiny chugging steam engine that had been resurrected from the Smith-

sonian Institute. Sometimes in the afternoon Jelfiffe and his staff would dress in light mail armor and, mounted on armored horses, practice with lances at targets. The small, electric-powered planes would swoop and dive about the field while the horsemen thundered after them, occasionally catching one on the end of a spear at which time the others would shout in triumph. On other days they would have contests with slings or simply throw stones by hand at straw-filled dummies. Other sports included skeet shooting, midget automobile racing, fencing, discus throwing and sailing races with small catboats on the lake.

Several times Dever brought out small vehicles with an elaborate covered apparatus on the hood. Each had levers, dials and a telescopic sight. One of the humans would get into each vehicle, aim the sights at the great needle lying on its target in the distant field. They would manipulate the controls and presently the needle would rise into the air some sixty or seventy feet. It would then fall, point first, onto the target. As far as the aliens could tell, the object of the game was to drop the needle in the exact center of the target. They asked no questions about the energies used in the game, and no information was volunteered.

Evenings they listened to the harpist or watched groups of players put on short skits in the living room. The humans looked at television, listened to a crystal set, played chess, go, dominoes, and checkers, read, talked and occasionally got drunk.

At the end of the second week the two aliens suddenly announced that they had to leave and asked Jelfiffe to signal their ship. They refused to give reasons and two hours later the sphere closed around them and slowly floated up to the cylinder. Several hours later the cylinder gathered speed and moved rapidly out into space.

Woodward again faced the general council; Dever and Jelfiffe at each side of him. This time the atmosphere was much more cheerful. Woodward was smiling as he continued.

". . . It was not too difficult once we made the analysis of the message. We were taking a terrific chance, of course, but a chance of some sort had to be taken. We were in a corner and had to do something. The fact that they left early proves we were right.

"They had obviously been listening to our radio programs. That was the most likely way they would have learned English. The programs concern all kinds of people and all types of adventures.

"Our best analyses were that they were rigid, somewhat hostile organisms who had probably made an analysis of us on the basis of our planetary conditions and our radio programs. They seemed to be making a check on their predictions when they sent us ambassadors. On the basis of *our* analyses we felt that

they would check their predictions once or twice and then act on them. If their predictions failed in unexpected ways, they would probably withdraw and find real emotional difficulty in re-attacking the problem. This should mean, we hope, that we will not see them again until *we* are ready to make contact.

"This, of course, is not ideal. Trade and information exchange would be much better. But neither race is now ready for contact. We both need more maturing. In particular, now, when we are in a hopelessly inferior position scientifically, contact between us would certainly lead to our being badly exploited. In the future, if we can catch up—and the evidence is that we will catch up—things may be different. When we finish analyzing all our new information—everything that was said by *anyone* on that estate was, of course, picked up on hidden microphones and recorded—we shall have an excellent store of knowledge about the aliens, their personality structure and even some of their science.

"The estate was rigged so that they could form no picture of us. The human inhabitants apparently followed a routine, but the things they did were taken from every age and every culture. We even faked one technique so they would be further hampered in judging us. We buried large coils in the ground, rigged them so that a heavy electrical charge flowing through them would throw the needle high in the air and then it would fall back point first. It looked like those contraptions mounted on the little cars made the needle go up into the air. In reality, of course, underground wires led out of the valley and our technicians there were tipped off by signals given off when the driver fiddled with the dials.

"In short, gentlemen, we have come through a major crisis and learned much from it. When we meet the aliens next time, it will be on much more even terms." He sat down to thunderous applause.

As their ship went into overdrive, Inot and Kcid were just finishing their report. "In conclusion," said Inot into the recorder while the entire crew listened, "this is an essentially primitive life class who were too unsure of their young sciences to meet us openly. They know of only aggressive, hostile organisms and had never observed a peaceful, friendly form of life and so could not conceive of one. Doubtlessly they projected their own rigidity and hostilities onto us and so saw our advanced science as dangerous to them.

"They, therefore, attempted to trick us using cultural techniques from many of their past ages. Naturally they did not realize that if our physical sciences were more advanced than theirs, our social sciences would be similarly advanced and it was no difficult trick to analyze them through the screens they

attempted to throw up.

"We were careful of what we said near their recording instruments and made sure they learned a good deal that they can use in advancing both their physical and social sciences. When we accomplished our purpose we left.

"When we next make contact they should be more mature. We will then be able to treat them as we wish to, as equals and colleagues. They will be wiser, more advanced and in short, when we next meet these aliens, it will be on much more even terms."

THE END

THE ANALYTICAL LABORATORY

For several months now, Astounding Science Fiction has been running novelettes and short stories only, with the result that—with the long serial installments omitted—we have been eight stories instead of the usual five. This was true of both February and March—so the point-scores look higher than usual. And still the results were as usual in one respect; no story failed to get at least one first-place vote. At any rate, here are the Lab reports on the two issues:

FEBRUARY

Place	Story	Author	Points
1.	I Tell You Three Times	Raymond F. Jones	2.71
2.	Historical Note	Murray Leinster	3.09
3.	Assignment In the Unknown	Frank Quattrocchi	3.35
4. Tied:—	Hideaway	F. L. Wallace	4.14
	The Friendly Man	Gordon R. Dickson	4.14
5.	Franchise	Kris Neville	4.71

MARCH

1.	Space Fear	James H. Schmitz	3.23
2.	Protected Species	H. B. Fyfe	3.43
3.	High Threshold	Alan Nourse	3.62
4.	Casting Office	Henderson Starke	4.05
5.	Philosophical Corps	E. B. Cole	4.86

There will be several more issues with no serial; I'd like some comments on whether or not you who, in actual fact, pay the bills, want serials or not.

THE EDITOR.

TWO-EDGED MIRACLE

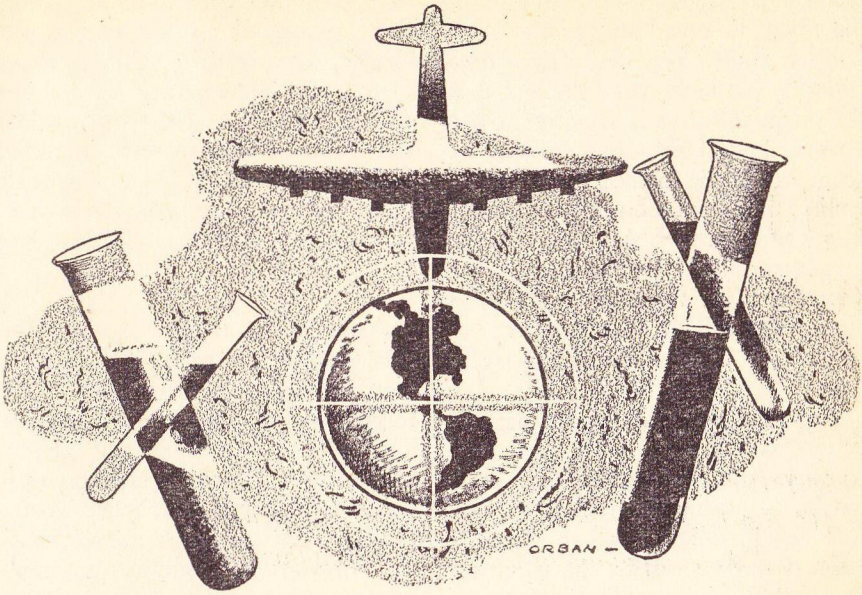
BY ARTHUR YUWILER

As life forms ourselves, the more we learn of life and its ways, the better we approach the maxim "Know Thyself!" But bacteriology is, today, sword-sharp on one side, and the companion of the plowshare on the other.

Illustrated by Orban

A strange and wondrous creature is man who, not content with his natural frailties nor his continual life-struggle with an adamant and powerful nature, is ever eager to discover new and more efficient methods for murder which he commits in the name of the will-o'-the-wisp, Right—a term he mouths reverently while in abysmal ignorance of its variable meanings. So feverish has this insane craving for death become that now the ripest fruit in medical science is in danger of being the next sacrifice to man's sublime idiocy, War. I refer, of course, to that group of compounds lumped under the popular title of "Miracle Drugs." It has always been the dream of man to find a panacea against the multitude of diseases that plague him and now, ironically enough, the panacealike antibiotics and chemotherapeutic agents have been evolved just in time to afford a practical method for waging the most insidious and deadly type of warfare conceivable, Bio-Warfare.

That biological warfare is no longer a mere figment of the imagination of some of the more grisly minded of science fiction writers can be made evident upon merely thumbing through any of the latest bacteriological or biochemical journals, where in innocuous appearing charts, graphs, and tables, are articles concerned with the disease-producing capacity of different bacteria in airborn droplets of various composi-



tions. The fact that most of these reports stem from the research laboratories of the armed forces further belies the seeming innocence of the reports.

To find a scene of comparable horror to that awaiting man today, it is only necessary to go back to the Middle Ages, when in the short space of a year, between 1348 and 1349, the terror of the "Black Death" ravaged Europe and killed an estimated twenty-five million people, one fourth of the entire population of Europe at the time. Even until very recent times the mortality rate resulting from plague has ranged between sixty and one hundred per cent, depending upon the form of the disease. The only barriers between us, now, and the epidemic plague of the Middle Ages, are sanitation methods which decrease the numbers of disease-carrying rats and, thus, the probability of infection and the few antibiotics which are effective against the causative organism, Pasteurella pestis.

The disease, however, in natural pneumonic form is droplet born, and since it is possible to make a strain of bacteria resistant to any antibiotic or chemotherapeutic agent—as will be shown later—both sanitation and treatment would become worthless if great clouds of virulent plague bacillus were sprayed over a city. Sanitation, in such an event, would be of no value, and without the aid of antibiotics and chemotherapeutic agents,

medical treatment would be back in the sixty to one hundred per cent fatality stage. We may take some comfort, however, from the fact that the plague bacillus is sensitive to the action of sunlight, thus billions of them would die in the process of infecting the population of a city. Further, there is the problem of whether it is preferable to merely weaken the populations of the cities with mild diseases or kill off everyone to save the cost of food and medical treatment.

Each nation has a ready natural supply of bacteria with which to wage biological warfare and, as a result, the crux of conflict of this sort lies in defense rather than offense. In other words, the situation is roughly comparable to the case of the two hunters facing identical lions without the aid of any offensive weapon. Each hunter employs all the defenses he has, and the one who finally succeeds in holding the lion at bay, assuming one finally does, is the "winner." Here is a case, then, where, in spite of the old adage, the best defense *is* the best defense. In the case of biological warfare, the only defense will be the use of antibiotics or chemotherapeutic agents. By this it is meant that each side will have to surreptitiously discover and produce these compounds in the same manner that a man hides his fortune in preparation for a rainy day. Then when the biological warfare is begun, each side will proceed to raise strains of bacteria resistant to everything but one or two of their secret drugs and then hurl these processed strains against the enemy, who, in turn, will use every drug he has hidden away in the hope that one of them will work against the disease. In this manner, mankind will create many new "miracle drugs" which might even prove useful providing someone is left to use them.

Aside from this grim aspect of the relationship of miracle drugs to man's future on this planet, we might take cognizance of the present day value of these drugs and the fertile paths of future scientific investigation that they reveal. Since we are dealing with two separate and distinct groups of compounds, however, it might be well to examine them separately. First, let us take those compounds termed by Ehrlich "chemotherapeutic agents" — from the Greek chemos-chemistry and therapy, to treat—exemplified by the sulfonamides and salvarsan.

The basis of all the chemotherapeutic research until recent years, lay in two well-known bacteriological phenomena. First, there was the metallic poisoning of bacteria or any tissue, and second, the remarkable selective staining and growth inhibiting properties of some dyes towards certain bacteria. An example of the latter may be clearly illustrated by Wright's Stain, a combination of the dyes methylene blue and eosin, which stains certain types of white blood cells, the neutrophiles, with a blue nucleus and pink cytoplasm, yet

stains another type, the lymphocyte, light and dark blue, thus exhibiting fascinating selectivity.

The metallic poisoning of bacteria and tissues, while completely unselective, is yet a valuable phenomenon allowing for a cheap, effective method of sterilizing water simply by passing it through sand containing silver in amounts too small to be detected chemically but of sufficient concentration to kill the organisms contained in the liquid. The mechanism of this poisoning is simply the combination of the metal ion with the protein in the cell, resulting in the formation of an insoluble salt or proteinate which then precipitates. Since the protein is the life substance of the cell, its precipitation naturally results in immediate death. Chemically, this may be expressed by:

$$R\begin{matrix}-COOH \\ -NH_2\end{matrix} + Ag^{+} \rightarrow R\begin{matrix}-COOAg \\ -NH_2\end{matrix} \downarrow$$

Where R stands for the protein molecule minus the functional groups COOH and NH_2.

The simple metallic compounds, as has been stated previously, are by no means selective in their action and, as a result, are irritating and often deadly to human tissue as well as the bacterial cell; thus, while sometimes used in the treatment of surface wounds, they are far too dangerous to be used in internal medicine. Examples of this are mercuric chloride and silver nitrate which, while capable of killing bacteria, are equally adept at killing the patient. Furthermore, these compounds have poor penetrability and lose their value in the presence of extraneous proteins, such as blood or pus, with which they can react as is witnessed by Koch's famous experiment showing that amounts of $HgCl_2$ many times in excess of the dose needed to kill bacteria in vitro—in a test tube—were valueless in vivo—in the living organism.

As a result of these difficulties, chemists began to look at the organic compounds containing metals, reasoning that the metal ion is less free to react so indiscriminately in these compounds since it is more tightly bound to the organic molecule than is the metallic ion in its inorganic salt. Also, since the organic compounds more closely resemble the body's cellular constituents, these compounds might be less dangerous in the patient's body. This line of endeavor resulted in numerous antiseptics, examples of which are: metaphen, merthiolate, mercurochrome, et cetera, which, as a whole, are more specific, less toxic, and more penetrating in their actions than their inorganic prototypes, and, most important, they are more effective against bacteria.

Again, in spite of the improvement of these organo-metallic compounds, they are still too general in action to be used with confidence in internal treatments. To cite another reference we may take mercurochrome, which was once used intervenously against blood poisoning but a series of unpleasant reactions such as diarrhea, nausea, and fever, cou-

pled with an increasing tide of reports claiming the treatment to be worthless, caused the practice to be abandoned. It was at this point that the phenomenon of selective dye activity entered the scene and provided a key towards the creation of substances which would react selectively like dyes and poisonously like metal salts.

To understand this selective phenomenon, we must first review a little elementary bacteriology. Bacteria are divided into two large groups based upon their ability to retain a dye upon vigorous decoloration with alcohol. The technique employed is of no concern to us, it being merely sufficient to state that all of those organisms retaining the dye are called gram positive and those that lose their color are called gram negative, gram being used in honor of the technique's author, Dr. Gram.

There are dozens of theories devised to account for this phenomenon of dye retentivity, only two of which are viewed with favor today, that of Stearn and Stearn and that of Churchman, which, while differing on many points, agree on the point vital to our understanding of selection. Specifically, this is that, at least, the surface proteins of gram positive bacteria are more acidic in character than those of gram negative. On this basis, one would then expect dyes containing strongly basic groups to be more powerful against the gram positive bacteria, due to the ease of acid-base combination, than the dyes containing acid radicals, which, in turn, should be more effective against the relatively basic gram negative bacteria. This turns out to be the case.

Basic dyes, however, are generally stronger in their effects than acid dyes due to the fact that the basic dyes react at an acidity in which only one major reaction is taking place, and that is:

$$R\begin{matrix}-COOH\\-NH_2\end{matrix} + \underset{\text{(Basic dye)}}{DOH} \rightleftharpoons R\begin{matrix}-COOD\\-NH_2\end{matrix} + H_2O$$

which is, in its essence, a simple case of the combination of an acid—the bacterial protein—and a base—the basic dye—to form a salt—the dye-protein complex—and water. The acid dyes, however, react at a hydrogen ion concentration at which two simultaneous reactions are taking place, the first between the acid dye and the relatively basic proteins of the gram negative bacteria:

$$R\begin{matrix}-COOH\\-NH_2\end{matrix} + \underset{\text{(Acid dye)}}{HD} \rightleftharpoons R\begin{matrix}-COOH\\-NH_3^+D^-\end{matrix}$$

and second between the bacterial protein and lipoids:

$$R\begin{matrix}-COOH\\-NH_2\end{matrix} + \underset{\text{(Lipoid)}}{HLi} \rightleftharpoons R\begin{matrix}-COOH\\-NH_3^+Li^-\end{matrix}$$

Both reactions proceed at about the same rate, the relative rates being a function of the hydrogen ion concentration of the solution, the temperature, et cetera. Obviously, with both reactions taking place at once, the acidic dye is much less effective in competing for the protein molecule than the basic dye, which has no such competition. Thus, there ap-

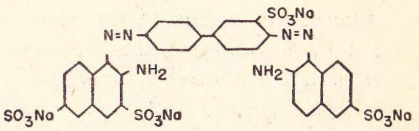
pears to be a correlation between the bactericidal activity and the basicity of the dyes, based on chemical reactions.

Once the bacterium has taken up the dye molecule, he finds himself in a position similar to that of a fly on sweet, sticky flypaper, for the molecule of dye is exceedingly difficult to destroy and the bacterium finds itself unable to either assimilate that portion of the dye molecule it could utilize or shake off the dye from the bacterial protein to which it has become attached. Thus, when sufficient dye molecules have accumulated, the bacterium is held completely helpless, unable to either utilize the dye or get rid of it, and as a result, soon starves to death or is dispatched by the body's defenses.

Naturally, dyes were investigated in the role of medicinal agents, but without too much success, for most of them either produced alarming symptoms upon introduction into the blood stream or were completely ineffectual in vivo. For example, Hatta showed that amounts of methylene blue, five hundred times in excess of the amount needed to kill Borrelia recurrent is, the causative organism of relapsing fever, in vitro had no influence on the organism in vivo. Dyes, however, are still used in the treatment of surface wounds of all sorts, as is witnessed by gentian violet, widely used in the treatment of eczema, Vincent's Angina, and other skin afflictions.

The credit for combining these two phenomena and, thus, being the godfather of chemotherapy, belongs to that fantastic, black-bearded genius, Paul Ehrlich. Struck by the selectivity of dyes, he hoped to find a dye with an affinity for a specific organism and to increase this dye's poisonous qualities by the introduction of lethal groupings in the dye molecule.

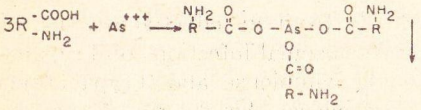
His first lead was the observation that the basic dye, methylene blue, showed a greater affinity for the organism causing malaria than for the host's tissues. Shortly after, upon experiments with the dyetrypan red, which showed activity against the delicate Trypanosoma gambiense causing African sleeping sickness, Ehrlich propounded the belief that the curative properties of the dye, as well as its selectivity, was a function of the nitrogen double dond, or azo linkage, N = N.



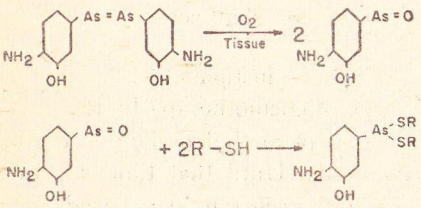
While the basis of his theory was wrong, it paved the way beautifully for a combination of the phenomena for, he reasoned, if arsenic, the periodic neighbor of nitrogen, were substituted for nitrogen in the N = N to give As = As, he should obtain a substance which was not only as selective as its dye prototype and, thus, less dangerous to the host, but also more toxic due to the arsenic. The search resulting from this line of endeavor culminated, after six hun-

dred six experiments, in the fabulous salvarsan and a large group of equally effective, if not so well known, compounds such as neosalvarsan, sulfarsenamine, et cetera.

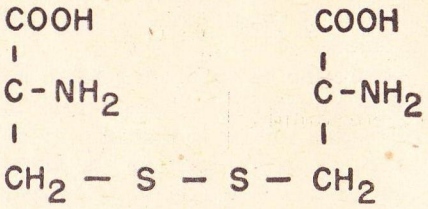
Throughout these experiments, Ehrlich had been working as systematically as possible on the theory that the arsenic was a poison by virtue of its ability to form the insoluble protein salt mentioned before, as is shown below:



The actual mechanism, however, seems to be that the tissues of the patient oxidize the arsphenamine, or salvarsan, to arsenoxide, which then, selectively oxidizes the sulphur-hydrogen combination contained in one of the protein building substances of the syphilis producing organism, Treponema pallidum. This sulfur-hydrogen or "sulfahydral" containing compound is essential in the microorganism's respiratory metabolism and the parasite thus deprived of this vital system, dies. Graphically this may be expressed as below:



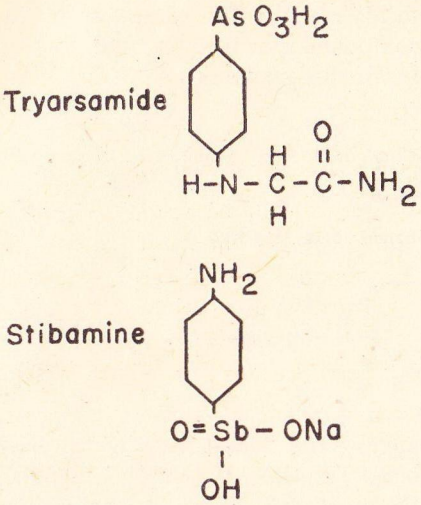
The toxicity of these compounds for man may be explained on the basis that human tissue contains the amino acid cystine:



which, as can be seen, contains a sulfhydryl group, and since this compound is necessary in the transportation of hydrogen in the cells, its destruction by the actions of the arsenoxide can result in cellular death. The variation in degree of toxicity between the human host and the microorganism can be explained in three obvious ways. First, that the sulfhydryl groups in the treponema are more susceptible to linkage and, thus, may be selectively oxidized by the trivalent arsenic. Second, the host's tissue cells may further oxidize the poisonous trivalent arsenic to the pentavalent form, which is nontoxic and readily excreted. Third, the host's blood and lymph may rapidly replace destroyed glutathione with unharmed stores of the compound. None of these three actions need be exclusive and, thus, all might be taking place at once.

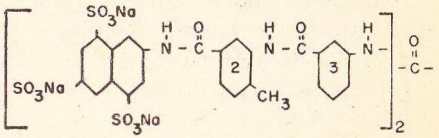
Naturally, this resulted in the search for more such compounds using oxidizing and reducing metals. This resulted in the synthesis of

organo-metallic compounds like those listed below:



Ehrlich's brilliant work demonstrating the trypanocidal activity of trypan red was the starting point for another phase of chemotherapy, that of interference with essential groupings and systems without resort to toxic metals. This came about in a rather strange way. After Ehrlich's work in this field became known, trypan red and, later, trypan blue were used in the treatment of certain protozoan cattle diseases. Since the meat became stained and, thus, unsalable after treatment, the synthesis of a colorless trypan bluelike substance was attempted by replacing the N = N linkage, which is the color conferring group—or chromophore, as it is called — with some other linkage. The grouping was used since it had already been tried in the related dye trypan violet.

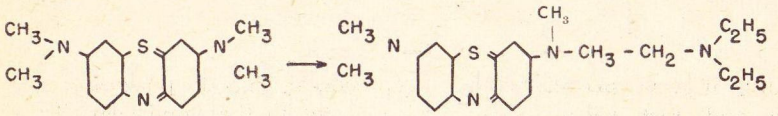
In 1920, as a result of this line of activity, the Bayer Works in Germany obtained a powerful trypanocide, called Bayer 205, whose structure was kept secret until finally uncovered by the work of Fourneau, who showed it to be:



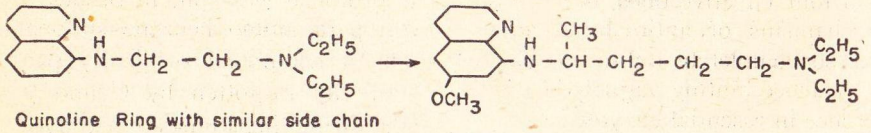
Aside from its effectiveness in the trypanosomal infections of Trypanosoma gambiense and Trypanosoma rhodesiense, this drug is of extreme importance because of its chemical specificity. Its action is dependent upon structure that if a methyl (CH_3) is shifted from the two to three ring, the toxicity is doubled and the resulting compound is only one sixtieth as effective. This remarkable specificity is reminiscent of enzyme chemistry and suggests that this compound has a structure extremely similar to one of the essential enzyme systems of the parasite and, thus, acts by competition with the true enzyme system for the bacteria protein. This concept will reappear again in a far more important form, as we shall see.

Ehrlich instigated still another phase of chemotherapy by the introduction of methylene blue into antimalarials. Until that time, all antimalarial research was based upon modifications of the quinoline ring, which appeared in the structure of

quinine. Schulman and his co-workers took Ehrlich's work as a starting point in their synthesis of the now famous plasmochin. From an amino compound of methylene blue, they obtained their first promising results. This led to a quinoline compound with nitrogen on the attached carbon chain and, finally, in 1924, to plasmochin. The evolution of this compound may be expressed, roughly, in this manner:

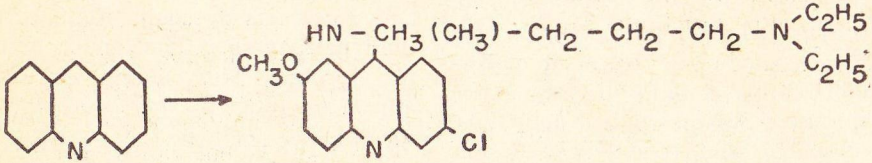


methylene blue — methylene blue modified



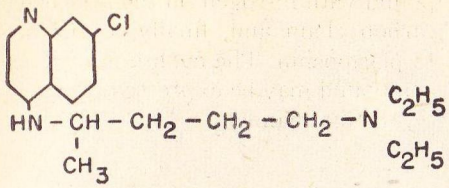
Quinoline Ring with similar side chain

Malaria, however, is an exceedingly difficult disease to work with since there are four species of protozoa that can cause the disease, and they do not all respond with the same readiness to drugs. To make things even more complex, the parasites undergo a complex life cycle during which susceptibility varies; therefore, while plasmochin is sixty times more effective than quinine against the sexual form of the malarial parasites, it is useless against the nonsexual form of one of the species, Plasmodium falciperum, and almost ineffective against the rest of the nonsexual forms except for Plasmodium malariae. Thus, other and better drugs were sought, one of which was Atabrine, synthesized by Mauss and Mietzsch in the manner shown below:

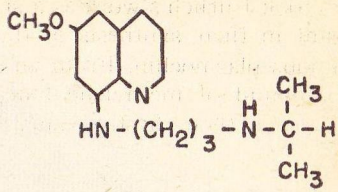


Notice, by the way, the similarity between this and plasmochin in regards to the CH_3O group and the side chain. The degree of hit-or-miss in these experiments can be estimated by realizing that twelve thousand compounds were prepared and tested in the discovery of plasmochin and atabrine and that during the recent World War, fifteen thousand more drugs were synthesized and tested with the result that two promising compounds were discovered and put through further tests:

SN 7618

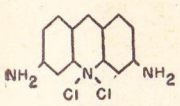


SN 13276

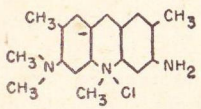


Therefore, it was necessary to synthesize and test twenty-seven thousand compounds in order to find four effective ones, because the mechanisms of antimalarial action are so completely unknown. There is evidence hinting vaguely at interference in essential enzyme systems; for instance, the formation of films over the surfaces of the attacked red blood cells. With the aid of newer techniques and the co-operation of biologists and chemists, these problems may be solved.

Most of the compounds discussed above have been effective only against protozoan diseases, for only a few of them, namely the acridine dyes Trypaflavine and Flaracide, were useful in the treatment of superficial bacterial infections.

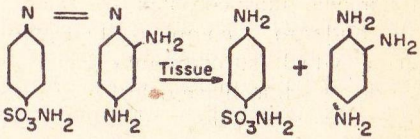


Trypaflavine

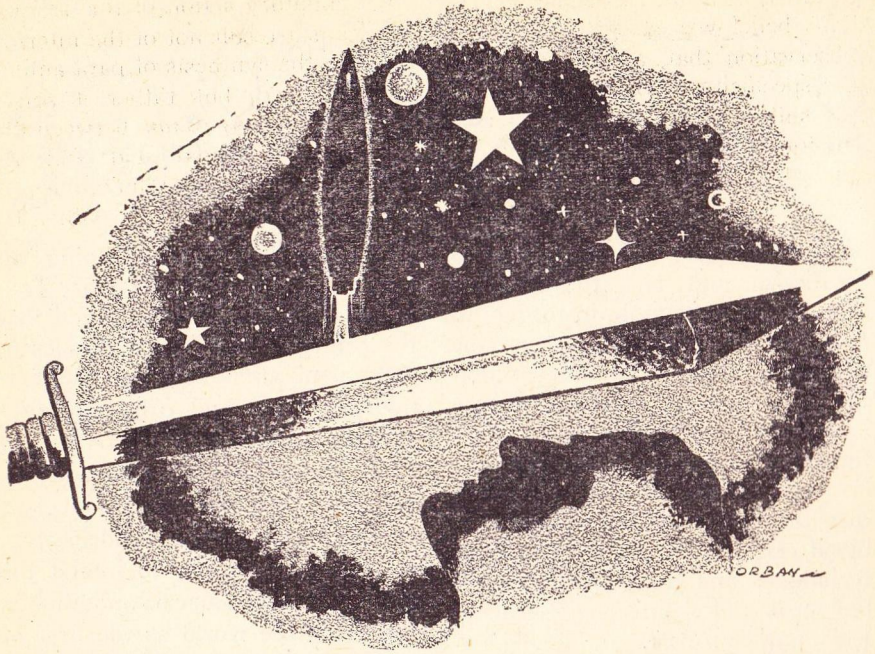


Flavicide

Chemotherapy in bacterial infections did not come into being until 1935, when Domagk published his Nobel prize winning report on the remarkable effectiveness of the azo dye, Protonsil, in the prevention of streptococcal blood poisoning in mice. Later in the same year, Trefouel, Nitti, and Bovet showed that the protonsil was split in tissues to form para amino benzene sulfonamide, a compound originally prepared and forgotten by Gelmo in 1908, during his studies of azo dyes, mentioned by Jacobs and that giant of immunochemistry, Heidelberger, as having the power to inhibit the growth of some bacteria and, finally, known to the world as the first of the wonder drugs, Sulfanilamide.



This drug and its twenty-five hundred progeny deserve the name "Wonder Drugs" for they are effective against not only a single species of bacteria but rather against almost the entire group classified as gram positive—including the causative organisms of boils, streptococcal infections, pneumonia, et cetera—and a number of gram negative organisms, like the cause of gonorrhea and cerebrospinal meningitis. Here again



however, the silver lining has a cloud for the sulfonamides even though they can be administered orally and are less toxic than any previous chemotherapeutic agents of this type, they are still too toxic for some hypersensitive individuals who experience a dangerous drop in the numbers of red and white blood cells, rashes, nausea, and diarrhea. Even more important, and a point that shall be elaborated on later, bacteria can become resistant or "fast" to the actions of these drugs.

In spite of these shortcomings, in fact, even if the sulfonamides were entirely useless in the treatment of infections, they would still be a step forward in the science of chemotherapy. The vague concept of producing enzymelike compounds as chemotherapeutic agents, which was hinted at in the specificity of the previously mentioned compound, Bayer 205, becomes more evident in the actions of the sulfonamides, and opens completely new doors for chemotherapeutic research.

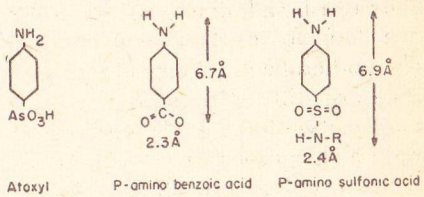
It was observed that the sulfonamides do not kill bacteria but only inhibit and slow their growth to a point where the natural defenses of the body can overcome the invaders. From this, it was inferred that the drugs probably interfere with an en-

zyme system in the bacterial cell. This belief was stregthened by the observation that, as in the case of the specificity of Bayer 205, a simple shift of the SO_3H group from the four position to the three or five caused a loss in potency, and a further shift to the two or six position resulted in a loss of virtually all activity.

Woods then found that the action of sulfonamides could be reversed by the compound para aminobenzoic acid and suggested that this compound was an essential requirement for the growth of the organisms. Further, he suggested that the action of the sulfonamides interferes with the enzyme system that normally synthesizes the para aminobenzoic acid in the bacterial cell and thus, cuts off its supply. It soon became obvious, however, that this could not be the complete explanation since, on these theoretical principles, the amount of para aminobenzoic acid necessary to reverse the sulfonamide effects should be independent of the concentration of the sulfonamide present, a condition that is not fulfilled by experimentation. Rather, it has been observed that the amount of para aminobenzoic acid divided by the amount of sulfonamide just necessary to produce bacteriostasis is a constant ratio. This constant ratio is termed the bacteriostatic constant and varies only with the specific sulfonamide or drug used and the organism it is used against.

The bacteriostatic constant and the other facts cited indicate that the inhibitory action of the sulfonamides is a result not of the interference in the synthesis of para aminobenzoic acid, but rather a consequence of *competition* between the para aminobenzoic acid and the structurally similar sulfanomides for essential enzyme systems. When the sulfa drug competes successfully with the para aminobenzoic acid, it becomes chemically incorporated in an essential enzyme system in which it is unable to perform the necessary functions required, and as a result the cell, deprived of this vital system, is rendered incapable of further growth and reproduction.

This theory of competitive inhibition is strengthened by several observations; first, that the reversal of action by para aminobenzoic acid applies to all the sulfonamides and to all the compounds having structures similar to that of the p-aminobenzoic acid, such as p-aminobenzamide and atoxyl. Further, the effective drug concentration of the sulfonamides is inversely proportional to the degree of ionization and, thus, the degree of ionic resemblance to p-aminobenzoic acid.

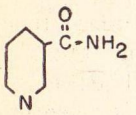


Along this line, it should be mentioned that the more electronegative the substituent groups on the sulfa derivative the greater the acid

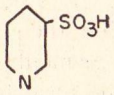
strength, and as a result, the greater the activity. There is a limit to the electronegativity, however, for if the substituent group is too electronegative, electrons will be withdrawn from the $-SO_2$ group to the R group, resulting in a loss of electrical similarity with p-aminobenzoic acid and a subsequent decrease in activity.

The Woods-Feldes theory of competitive inhibition has been tested and tried with other compounds than the sulfonic acid analogue of p-aminobenzoic acid. For example, McIlwain showed that pyridine-3-sulfonic acid, the sulfonic acid analogue of the essential bacterial requirement, nicotinamide, can also inhibit bacterial growth. Similarly, bacteria that require pantothenic acid for growth may be inhibited by the use of pantoyltaurine.

Thus, a method has been evolved for the systematic preparation of compounds closely related in structure and electron density to essential

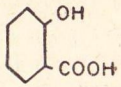


Nicotinamide

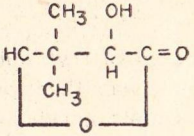


Pyridine - 3 - sulfonic acid

bacterial enzymes and metabolites. Notwithstanding the medical importance of this type of endeavor, its greatest applications may lie in revealing the intricacies of life to the biochemist and physiologist. An example of the application of inhibition to the determination of biological functions may be given by the common organism E. coli. It was shown



Salicylic acid

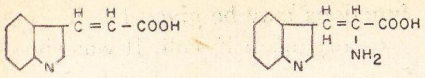


Pantolactone

that this organism may be inhibited by salicylic acid. This inhibition may be reversed if pantolactone is added.

It is further known that normal E. coli produce pantothenic acid necessary for their growth. Therefore, since the addition of pantolactone restores the organism's ability to produce pantothenic acid, it can be asserted that: 1. the pantolactone is one of the steps culminating in the synthesis of pantothenic acid; and 2. it is one of the steps in the synthesis of pantolactone itself that is inhibited by the salicylic acid.

By continuing this process of finding simpler and simpler products that will give pantolactone and will reverse the inhibiting effect of salicylic acid, it is possible to trace the synthesis of pantothenic acid in a stepwise manner down to the product whose synthesis is blocked by the salicylic acid. It is obvious that this can become a valuable tool in the study of intracellular chemical reactions. Another example of this important method is the work of Feldes showing that E. coli and Ebert. typhi were inhibited by indole acrylic acid, but not by other indole derivatives and that the inhibition was reversed by the addi-



Indole acrylic acid Tryptophane

tion of tryptophane, but not indole. It was therefore inferred that the indole acrylic acid interfered with the synthesis of tryptophane from indole.

This new approach offers great hope for the future of chemotherapeutic research. At the same time, there is another new and profitable field of "miracle drug" research in the form of the antibiotics.

Antibiotics are, in reality, a consequence of the dog-eat-dog type of world in which we live with its antagonisms of individual against individual and group against group. First, we should take up the medical applications of the consequences of bacterial antagonisms among members of the same species, iso-antagonisms. Besredka, in 1925, first used this iso-antagonism therapeutically by applying filtrate from anthrax cultures to anthrax wounds. The principle behind this was simply the toxification of the media by the enrichment of wastes resulting from growth.

This principle of an organism's inability to grow in the presence of a sufficient quantity of its own wastes was the basis for the science fiction story "Adaptive Ultimate," as you may remember. It is obvious, however, these iso-antagonisms are limited in therapeutical value since their application would only be of value in open wounds and even then, only when dealing with a specific organism. Much more valuable and far reaching in scope is the research on the antagonisms between bacterial races, heteroantagonisms, which result in the production of the true antibiotics.

The subject of antibiotics is extremely complicated, involving the almost infinite number of inter-relationships among different biological systems of both simple and complex life forms. Little is known of the mode of formation of antibiotic substances, their mode of action, or even of the basic chemical or physical principles involved in their actions. In chemical and physical properties, antibiotics differ widely. There are acids, (penicillin) fats, (pyocyanase) pigments, (prodegision) proteins, (gramicidin and subtilin) bases, (streptomycin) ketones, quinones, sulfur-bearing compounds, and almost every other conceivable type of organic compound. They vary greatly in their solubilities, their stability, and their action. Most of them, like penicillin and actinomycin, are bacteriostatic, preventing bacterial growth, but others kill the bacteria and are, thus, bacteriocidal and a few actually dissolve the bacterial cell (bacteriolytic). In a similar manner, they differ in toxicity towards higher animals and in usefulness in therapy, some being nontoxic, others deadly, and all greatly influenced by the nature of

the host and by the type and degree of infection.

Because of the chemical diversity of these compounds, the chemist is provided with a rich fairyland to explore, first, by determining the structure of natural antibiotics and second, by synthesizing similar but more valuable compounds using these structures as models. This will undoubtedly result in the production of a series of new compounds with which the physician may fight disease. Further, if antibiotically active portions of the molecule can be determined in this process, it may be possible to produce cheap synthetic compounds rather than the more expensive biologically prepared ones. It may also be possible to eliminate the toxic groupings of some highly effective but very toxic antibiotics without injuring the therapeutically active structures. The combination of a number of active groups affecting different bacteria into one "cure all" type compound may also be a possibility.

The field is no less tempting for the biologist or bacteriologist since very few of the known antibiotics have been adequately tested, and everywhere one turns of late he encounters new forms from surgical maggots, slime molds, egg albumen, and all sorts of bacteria and fungii. Even the disease-producing organisms contribute to the collection. Organisms such as Klebsellia pneumonia and Salomenella paratyphi—causing a typical pneumonia and paratyphoid fever, respectively—produce an antibiotic inhibiting the causative organism of bubonic plague, Pasteurella pestis. Furthermore, a single organism may often produce a number of different antibiotics, or a specific antibiotic may be produced by a number of different organisms. There is seemingly no visible limit in this field, for even in the unlikely event that all natural antibiotics are discovered and tested, there is still the method of "forcing" enzyme and antibiotic production.

This technique, which is, in essence, a modification of the science fiction principle of necessary adaption, was first demonstrated by Dubos in 1938. He published a paper revealing the forced production in soil bacteria of a specific enzyme which decomposed the capsular gum of a specific subspecies of Diplococcus pneumonia, the cause of pneumonia. This was accomplished similarly to Kidder's forcing his Neotrics to produce superstrong aluminum in the science fiction classic, "Microcosmic God." He provided the specific capsular polysaccharide to be destroyed, as the only source of carbon in the media. In order to survive, it became necessary for the soil bacteria in the media to evolve an enzyme system capable of breaking and utilizing the gum. The resulting enzymes produced were effective in treating mice infected with pneumonia. This was a direct consequence of their power to break

down the gummy capsule which protects the bacteria and, thus, to expose the bacteria to the patient's bodily defenses. The major point, however, is that once the organisms produce the enzymes, they will continue to produce them for a large number of generations even if the specific stimulus is no longer in the medium used for growth. This means that it may be possible to force the production of antibiotics with a given bacterial spectrum.

This forcing of antibiotics may come in very handy as a result of either the phenomenon of natural drug resistance or "fastness" of the artificially created resistance that may be used in biological warfare. The first observation that an organism can become resistant to drugs was made by Ehrlich, who reported the occurrence of syphilitic organisms—Treponema pallidium—which were immune to the actions of arsphenamine. In order to prevent the occurrence of this resistance, he proposed the treatment of the patient with one large dose in the hope of curing the disease before the organisms could adapt themselves and acquire resistance.

This drug adaption assumed more serious proportions in the case of the sulfonamides, especially after the advent of sulfanilamide "band aids," gargles, toothpastes, chewing gums, and the like that hit the market after its widespread publicity as a miracle drug. Doctors suddenly found infections which once responded with magiclike rapidity to the sulfonamides now required prohibitive amounts of the drug in order to be effective. Then came the startling observation that even after a patient had been pronounced cured, it was possible for him to carry the resistant bacterial strain in his body for periods up to five years, and these strains were capable of causing sulfonamide resistant infections. In accordance with the Woods-Feldes theory, a resistance to one of the sulfonamides also conferred resistance to all.

As the percentage of sulfonamide resistant infections mounted, penicillin rolled onto the medical scene. Claims were immediately made that it was not only more effective than the sulfonamides, but also incapable of causing virulent pencillin resistant strains. The latter belief was based on early work supposedly demonstrating that as a strain of bacteria becomes pencillin fast, it loses its virulence. Unfortunately, this view was unsubstantiated by later work which showed that not only was it possible to obtain virulent penicillin resistant organisms, but that these organisms often persisted in a carrier state similar to that occurring with sulfonamide resistant strains. This resulted in the transmission of penicillin resistant infections.

Fortunately, sulfonamide resistance pointed out the folly of self-medication wherein the concentration of the drug is small enough to enable the bacteria to adapt by modifying its enzyme systems. This warning, plus the fact that penicil-

lin is sufficiently nontoxic to allow tremendous dosage, has kept the incidence of pencillin resistant strains at a minimum.

Obviously, this resistance is not limited to the natural adaption in vivo. Bacteria can be made resistant in a test tube so simply that a child or an armed forces laboratory technician can do it. The technique consists of just growing the bacteria in a medium containing the specific antibiotic in larger and larger quantities until complete resistance is obtained. Since resistance to one antibiotic does not exclude resistance to others, one may easily obtain a strain resistant to every and/or any antibiotic. The consequences of such techniques in biological warfare can easily be imagined.

It seems incongruous that man would dare wipe out one thousand years of medical science in order to win a war against his fellow man and risk losing a still greater war against disease. It becomes more and more evident that science is a two-edged weapon with which man can cut his way to the stars or slit his own throat, and while man has sought to slay himself before, never has the blade been so long nor the edge so keen.

MOST RECENT BIBLIOGRAPHY:

1. ROBLIN *Chem.Rev.38,*255(1946)
2. GOLDBERG *Arch. Biochem. 14,* 480
3. LAMPEN *Jour. Bio. Chem. 166,*435
4. LIPMANN *Neut. Rev. 5,* 331 (1947)
   Neut. Rev. 6, 153 (1948)

THE END

IN TIMES TO COME

James Schmitz is back next month with a cover story—cover by Rogers remains the familiar by-line in that department—titled "The End of the Line." It's a slightly different slant on the not exactly new problem of the dissident group with an "I Want To Be Alone" reaction. It can get to be awfully difficult to be a hermit in a very thoroughly organized, ordered, and regulated Galaxy—and even harder to be a little bit different . . .

There's also a novelette by an author who's appeared in these pages for some twenty-one years now—one of the very, very few men who has been a leader throughout those long years that have seen the change from *Astounding Tales of Super-Science,* and all that went with it, to the present, very decidedly different magazine. The yarn's called "The Greatest Invention," and the answer Williamson has would not have been accepted in the not-so-dear but thoroughly dead days of the tales of super-science. The greatest invention is, of course, one no one ever saw when he used it, or heard when he listened to it. But invaluable, none the less!

THE EDITOR.

BOOK REVIEWS

"The Moon Is Hell," by John W. Campbell, Jr. Fantasy Press, Reading, Pa. 1950. 256 pp. $3.00

It should be no news to the readers of this magazine that they lost a lot when its editor, John Campbell, decided to quit writing and stick to the blue pencil. Fantasy Press now gives convincing proof of this with the best book it has published in 1950 and one of the best anyone has brought out recently, containing the hitherto unpublished title story, "The Moon Is Hell," and a "Don A. Stuart" masterpiece, "The Elder Gods".

Surely everyone who has done any science fiction has dreamed of writing a realistic story of the first men on another world, worked out with an absolute minimum of hokum —no green princesses, no ruins of alien civilizations, no hostile high priests. The ultimate would be the story of the first men on the Moon—a world without air, without life or the possibility of life. That is the story John Campbell has told as no one else, except possibly Heinlein, could tell it, in "The Moon Is Hell".

It is the story of the last nine months of the first Lunar expedition, while they are waiting for the relief ship to take them off after two years on the blind side of the Moon. The story is told in the journal of Dr. Thomas Duncan, second in command, beginning when the relief ship crashes and the little community of thirteen men realize that they must keep themselves alive by their science until a new ship can be built and sent to them, and ending when that ship lands. To make air, to make water, to restore their power sources from the naked rocks of the Moon; to get word to Earth, then make themselves self-sustaining until Earth can reply—those are the problems which must be faced by any group who seek to establish

themselves on the Moon. John Campbell shows how it would be.

"The Elder Gods" is entirely different—as different as a Don Stuart story always has been from a John Campbell science story. Though some of its characters are nominally gods, it is hinted that the time is our own far future and that these "gods" have scientific meaning if it could be found. Here is the swash and buckle of a Robert E. Howard Conan story, a Fritz Leiber adventure of the Gray Mouser, or a "George Fletcher" romance of Vastmanstad, with the added touches which spell Don Stuart, as the outlander, Daron of Kyprost, champions the cause of the Elder Gods of Ator with sword, fist, and wit against the "magic" of the Invisible Ones and their undead heirophants.

To top it all, Hannes Bok has painted a lunar landscape which is practically a Chesley Bonestell for the book's jacket. Who can ask for anything more?

P. Schuyler Miller

"Cosmic Engineers," by Clifford D. Simak. Gnome Press, New York. 1950. 224 pp. $2.50

Although it is expanded from the original version in Astounding Science Fiction, this space-action yarn is still much shorter than the E. E. Smith-Jack Williamson type of world-saver on which it is patterned. For novelty's sake its heroes are interplanetary newshounds, who pick up a girl-scientist in a state of suspended animation in which she has spent a round thousand years. That millennium was spent in thinking, which gives Caroline Martin a distinct advantage when it comes to tracking down the mysterious voices from the depths of space, and following them to the very fringe of the expanding universe, where a metal race who call themselves the Cosmic Engineers are trying to avert the universal collapse which will come when our continuum "bumps" into another fast approaching through the fifth dimension. Many races are called upon to help, but only Man can be of service. How the hostile race known as the Hellhounds try to block the rescue, how Caroline and her friends seek help from a dying Earth of the far future, duel with the Hellhounds at the whim of a senile entity, and in the end solve the secret of the Engineers is the story. Good fun, but nothing to weight you down with ideas.

P. Schuyler Miller

"A Gnome There Was," by Lewis Padgett. Simon and Schuster, New York. 1950. 276 pp. $2.50

Lewis Padgett—which is only another way of saying Henry Kuttner

—has been one of the most-neglected authors in the entire science-fiction field, so far as book publication is concerned—unless he has also been using such pen names as Jack Williamson and E. E. Smith. He is now represented by eleven stories ranging from such masterpieces as "Mimsy Were the Borogroves" and "Jesting Pilot" to the pure fun of the title story and the tongue-in-cheek corn of "See You Later." Not that I'm not fond of the Hogbens—

A jacket copywriter who seems actually to have read the book says: "Padgett might be considered a mixture of unequal portions of Charles Addams and Lewis Carroll." There's a third ingredient there too—the ingredient which puts the tang into "The Twonky" or "This Is the House" or even "Rain Check." Call the whole thing one of the best one-man-shows available, and up with "Null A" and "The Humanoids" so far as Simon and Schuster's publishing is concerned.

P. Schuyler Miller

"Galactic Patrol," by Edward E. Smith, Ph.D. Fantasy Press, Reading, Pa. 1950. 273 pp. Ill. $3.00

"Galactic Patrol," when it appeared here in 1937, immediately won new laurels for Doc "Skylark" Smith. It introduced the indestructible Kim Kinnison, Gray Lensman, champion of Civilization, and scourge of Boskone. It gave us the irresistible redhead, Clarrissa MacDougall. It presented the Galaxy's most friendly dragon, Worsel of Velantia, and that equally admirable walking oil-drum, Tregonsee of Rigel. On the debit side it pitted these comrades-in-arms against such competent foemen as the Overlords of Delgon, the Wheelmen of Aldebaran, and Helmuth, "who speaks for Boskone." Who or what Boskone might be remained obscure when the story ended.

Originally this was the first of the Lensman stories. It is now the third, since "Triplanetary" has been rewritten and "First Lensman" written—both Fantasy Press, $3.00—to take the conflict between Arisia and Eddore back to the dawn of mankind. However, Doc Smith has not dragged the powers behind the scenes out into the open as he did in the two earlier books, with the result that this version has all the usual breathless Smith pace plus the puzzle of unseen forces working against the Lensmen in general and Kinnison in particular. E. E. Smith created a whole school of science fiction with his "Skylark of Space" stories, then topped himself with these cosmic shooting-parties. What John Ford is to horse-opera—Grade A, homogenized—Doc Smith is to space-opera. And Kim Kinnison is his John Wayne.

P. Schuyler Miller

Willy Ley: "Dragons In Amber" (Further Adventures of a Romantic Naturalist). N. Y.: Viking Press, 1951, viii + 328 pp., $3.75.

Any reader of—or writer for—Astounding should have enough intellectual curiosity to wish to know something about the scientific background, and the pros and cons of scientific controversies, on which the speculations and extrapolations of the stories are based. To date Willy Ley has perhaps done more than any single contemporary author to provide sound and readable popularizations of science in the borderline fields where fact shades into romance.

Now our favorite polymath has done it again; Willy has produced a successor to his deservedly famous "The Lungfish, The Dodo, And The Unicorn," which ought to be just as successful. "Dragons," like its predecessor, deals with various odd aspects of life on Earth—aspects that were not covered in the previous book.

This work is divided into three parts. In the first, "Records In Stone," the author gives an extended account of amber. He tells the story from Homer and Pliny on down: what kinds there are; how the stuff has been gathered, mined, traded, and used for millennia; about the insects found occluded in it and what they prove; about the vain search for the primary amber deposit from which the Baltic-North Sea amber originally came.

Next comes a story of scientific detection: the reconstruction of certain Triassic reptiles from their footprints alone. And then the tale of the long controversies over the ichthyosaurs. Finally he gives the story of the woolly mammoth, our old friend from many sf stories laid in the Pleistocene, an animal whose size has been grossly exaggerated, but still the most completely known of all the animals that became extinct before historic times.

The second part of the book is "The Last Of Their Kind": dramatic and pathetic stories about animals and plants that have been narrowly saved from extermination, and others that are still going but that ought to have become extinct along with their relatives millions of years ago. There are the Chinese milu—Père David's deer—of whom the only survivors are a herd in England, the giant panda, and the bird takahe from New Zealand. There is also a group of "living fossils" from the plant world: the ginkgo, the sequoias, and the cycads. Bob Heinlein drove Willy to see the big trees in California some years ago, and Willy reveals that, so far from being restricted to their tiny ranges in California, the redwoods are doing fine in Europe and New Zealand.

Lastly comes "Wanderers Across The Planet," the story of "adventive" fauna and flora. This begins with the mystery of the common eel and how it was solved. The story ends with a hair-raiser: the

six-foot eel larva caught some years back off West Africa by Danish scientists. If this thing grows in the same proportion to its larval size as the common eel, it might develop into a seventy-foot monster.

Willy also tells the curious tale of the camel, reintroduced by man to its continent of origin, North America, a little less than a century ago, where it had become extinct in pre-Columbian days. He tells of the two Arab camel-drivers who became well-known characters in the Old West, and goes into the phylogeny of the camel and the time and place of its domestication.

Then he tells the story of the spread of pests from one part of the world to another: the Japanese beetle, the giant African snail, and the Chinese mitten crab among others. Finally he tells about the eruption of Krakatoa and its aftermath: the gradual repopulation of the remnant of the island with life, beginning with blue-green algae and ending with coconut palms and pythons.

Because of the nature of its subject-matter, this book is a little more factual and less speculative than the "Lungfish." But it is written in the same leisurely easy-flowing style, with the same wealth of entertaining incident from the history of Continental European science, most of which is not available elsewhere in English.

I might take a couple of very small exceptions: Willy says that the mammoth's recurved tusks were useless, but there is a plausible theory that they were employed as snow-shovels to get at deeply-buried plant food in winter. The author accepts the usual disparagements of the camel's disposition, but Owen Lattimore insists, on a basis of personal experience, that under kind treatment—which they don't get from Mongols and Arabs—camels become just as tame as horses or dogs. And at last account condors were not confined to South America; California still had about two dozen of its own rare species.

These however are negligible points, introduced more to uphold my own reputation as an impartial book-reviewer than as a serious criticism of Ley's fine work. Olga Ley has again provided a profusion of admirable drawings. Anybody, whose interest in science-fiction and its sources ranges above the pure space-opera level, should by all means get a copy.

L. Sprague de Camp

Agreed! J. W. C. Jr.

THE END

★ ★ ★ ★ ★

THE MAUKI CHANT

BY J. A. MEYER

***The chant** was not a song, or a prayer, or an invocation — it was something of all three, and the sounds were the wine of rebellion, too!*

Illustrated by Ward

Major Hopkins was half asleep when the singing began. It was low, and soft, and for a while he was not sure whether he was hearing or dreaming. It was a woman's voice. And there was only one woman aboard this big spaceship. He reached out in the darkness, and picked up his phone.

"Control? Hopkins. Tell the guards to shut that woman up."

"You mean the *mauki,* sir?"

"Yes, the mauki! Tell her to shut up. I can't sleep." He slammed the phone back in its clip.

The singing didn't stop, though. It kept on, and it kept him awake, tense. Captain Corcelli stuck his head in the door suddenly.

"Hear that singing?" he asked.

"Certainly I hear it. I told the guards to shut her up."

"Shut her up?" Corcelli said. "Have you *listened* to her? That *voice!* She could tear the soul out of a corpse." Hopkins slid off the sleeping shelf, and went into the jumpway of the big spaceship. The lights were on, and he could see half dressed men clumped around the brig. And he could hear the singing clearly—

Do you dream of Earth
And broad blue seas
The clear blue sky
The tall green trees
The birds that fly
In the warm spring breeze
The leaves that die
The brooks that freeze
And the snows that lie
In majestic ease.
And the wives who cry

He started gliding down the long passage.

Do you dream of Mars
And scorching sands
The clear thin air
The crusted lands
The rocks that tear
The miners' hands

"All right men, at ease." No one seemed to notice his approach.

The cliffs that stare
At the burnt brown hands
Of shrubs that share
The sun seared lands
And the wives who care

"Attention! ATTENTION!" It was a command this time. There were awkward off-balance salutes. A murmur. "You men look like green cadets. Out of sectors after watch. You know the rules on this ship. A month's pay dock for all of you, and three days on yeast and water." His voice was hard, echoing off the thin metal walls in harsh overtones.

"Sir—" one of the captains began.

"Back to sectors!" he snapped. The men broke up, and kicked up the passageway. Hopkins turned to Corcelli. "I don't understand. We're in a battle sector, liable to ID attack any minute, and these men are deliberately losing sleep."

"Maybe they've found something more important than sleep," Corcelli said. Hopkins snorted.

"I'll show them what's more important. I'll have them all standing double watches. Then they'll sleep." Corcelli shrugged.

"Sir—" Hopkins whirled, faced the

brig. The woman was looking out at him, her eyes dark, her face puzzled.

"What do *you* want?"

"Sir, what have you done with my son? I miss him." Hopkins' mouth narrowed into a thin line.

"You said he was born in Space, didn't you? *All children born in Space are IDs.*"

"I told you I was an ID's wife when you captured me. I'm a *mauki.*"

"You're insane. And your son is dead. We ejected him into Space ten hours ago. That's an OSI law."

There was no answer. No crying, no whimper.

"Holy Phobos, you *didn't—*" Corcelli began.

"Certainly. Regulations."

"You make me sick," Corcelli said. "What did that kid ever do to you?"

"He was an ID."

The mauki had been captured eighteen hours before, fished out of a little crippled scooter that was drifting just inside the nearest Ring clump. The big OSI spaceship eased up to it cautiously, and grappled it into the air lock. There was a woman and a seven-year-old boy aboard. The woman was a slender brunette. The boy was a pale, white-haired kid with sharp watchful eyes.

The ship was definitely an ID scooter. Part of the electronic control of the pile was disabled. Hopkins guessed that the ID man had sledded off for help or repair parts, before they came, which would mean a heavy ID concentration nearby.

The IDs were slippery targets to find, and impossible to trap into a battle in open Space. They were always scattered through the Rings, scooting out of any trap OSI laid for them. Hopkins saw a good chance to make a sweep. He had the scooter pushed back into Space with a monitor on its radio, figuring that the ID would come back with equipment or help, or both. In the meantime, he had to hide.

Sleek, streamlined 6-G spaceships were all right for air-space jumps, but for the long orbits, light 1-G jobs meant fuel economy, and spheres had the added advantage of the lowest possible moment of inertia, which meant valuable maneuverability in the Rings. The OSI spaceship, a thin magnesium ball of sixty meter radius, had the military disadvantage of a characteristically regular silhouette, that made it as easy to spot as a cue ball in a coal bin.

Hopkins had the big spaceship moved slowly against a huge dark drifting rock mass, and blacked out so it was almost impossible to distinguish it from the meteorite. The scooter was a kilo away, orbit-locked in the middle of nowhere. Nothing could approach it without being seen and radar tracked. When the IDs came they'd be sitting ducks. Maybe they'd capture some. In the meantime, Hopkins was sure the woman would provide some information about the ID base.

She admitted she was the ID's wife. Her son, she admitted, had been born in Space. Hopkins had that entered in the log. Then he asked her where the nearest ID base was.

"I don't know," she answered. Hopkins looked sharply at the little ID-ling, and a cold sneer curved his thin lips.

"I'm sure you can remember, if you love your son." The mauki looked at her son, and he nodded his little fuzzy white head.

"I don't know."

Hopkins sensed that she meant it,

but he had the ID-ling taken out of the cabin. Then he had the psycho doctor give her the works with drug hypnosis – scopolamine, nitrous oxide, archimedes spiral, harmotone, everything.

"I want to make her monitor that scooter radio, so if the ID calls, she'll lead him in. We'll have to get her under control," Hopkins said. The doctor stopped after five hours.

"It's no good. She just doesn't hypnotize. Remarkable. I didn't think anyone could resist this treatment."

"All right, lock her up!" Hopkins said disgustedly. "And I'm going to enter this failure in your record." The doctor shrugged, and dragged the mauki's weightless body down the passageway to the brig. He pushed her in, and locked the door.

About five hours later the mauki began to sing.

The big spacesphere was silent for hours after Hopkins told the mauki her son was dead, but the major sat sleeplessly on his G-couch, and stared bitterly into the darkness.

He could still remember the sullen look on the boy's face when they closed the air lock on him. That little brat knew what was coming, and he never blinked an eye. Hopkins' fists clenched as he remembered the half sneer, half smirk on that small face. It was just as if the little ID knew something– Hopkins dismissed the idea. The brat was dead. His body would be drifting a few meters from the spaceship, with blood-crusted stains from his ears and mouth. Dead.

Hopkins got off the shelf quickly, and out into the passageway. He rapped on Corcelli's compartment. Corcelli stuck his head out sleepily.

"Captain. Get your clothes on. I'm going into the icebox."

Corcelli saluted, and slipped into his coveralls and jacket, muttering under his breath.

"What do you want outside?"

"The ID-ling," Hopkins said.

"Aren't you satisfied? Do you have to drag his dead carcass back on board? Isn't killing him enough?" Hopkins didn't answer, but dove down the passage to the space lock. He slid into a suit, and Corcelli helped him tighten on the helmet.

"He should be just a few meters beyond the lock," Hopkins said. He clumped into the space lock, dragging his pumping unit. The hatch slammed shut and the pressure lowered. Then there was a clang as the outer hatch opened. Corcelli listened with his ear against the thin wall for a long half hour. There were metallic sounds, and then the outer hatch slammed shut.

Corcelli opened the pumps, and watched the pressure gauge. At balance, Hopkins pulled the inner plate in, and dragged his pumping unit back into the passage. Corcelli unbolted the helmet.

"What took you so long?" he asked. "You shouldn't have been gone more than three or four minutes." Hopkins' face was as white as chalk.

"I looked all around the ship. The ID-ling's body is *gone!*"

The alert jangled through the ship, erupting streams of spacemen through the passages of the sphere. Radar had reported not a trace of anything approaching the ship in sixteen hours. There was *nothing* that could have knocked the ID-ling's body away from the ship, and yet, he was gone.

"We can't tell what it was, but I want a full alert until I countermand it. We're in ID territory now, and we're liable to an attack at any time," Hopkins said. The captains nodded, and saluted.

"What a jittery bunch," Hopkins said, after they left.

"*They* didn't give the alert," Corcelli reminded him. Hopkins gave him a hard look, and slumped into his G-couch.

"We'll wait and see." The major loosened his blouse, and wound his wrist watch nervously.

"How about smoking permission for the crew?" Corcelli asked. Hopkins shook his head. They sat in the still ship, waiting, listening, not knowing exactly what they were afraid of.

The singing crept softly through the ship, a warm background tone to the small shuffling noises the waiting men made. It got louder, and Corcelli looked at the major. The pressure bulkhead was in battle-ready, half shut, but the whispering sounds seeped into the control cabin, and grew louder, into words.

Where is your home, wanderer?
Your home, your home
That house, that wife
The sighing breeze
That stirs tall trees
Cuts like a knife
Wherever you roam
Where is your home, wanderer?

The chant had a strange rhythm, and the mauki's voice sounded sometimes like a strangled sob. Corcelli felt a tightness in his throat. He switched on the recorder quietly.

Out on your jets, thunderer.
Your jets, your jets
That squealing scream
Shuddering dumb
Titanium
Outreaching stream
But have no regrets.
Out on your jets, wonderer.

There was no sound for a long minute after the song stopped. It was almost as if everyone on the ship was holding his breath, afraid to shatter the mood. Not a word, or a cough, or even the little noises of moving against the metal walls.

"What is this? A morgue?" Hopkins snapped. His harsh voice shot up to a high pitch, and he coughed. Nobody spoke. "Talk, will you. Talk!" He looked around hostilely. Corcelli turned to the radar man, to say something, but the technician had a faraway look in his eyes.

Do you hate the taste
Of tank grown food?

The singing crept through the ship again, this time a vaguely familiar melody.

And hate this hell
Of walls gun-blued
A whining shell
Of rocket-spewed
Once-men. The wail
Of jets subdued
The oily smell
Of air renewed
And—up! The bell!

The last was a shriek that echoed and re-echoed off the walls, jerked the men to instant alertness, and there was scuffling and dim noises down the passage.

Do you miss the sloosh
Of Venus bogs
The squish of clay
And rotting logs

Soothing, whimpering. Soft velvet voice playing on their tense nerves, thickening their throats, and burning their eyes.

The night's damp gray
The drizzling fogs
That drench each day
The big mulch clogs
That ooze away
And the wives who pray

The last note seemed to haunt the curves and levels and gangways somehow, so they could still hear it long after the mauki stopped.

"Bring that woman up here," Hopkins snapped, his voice hard, metallic against the stillness. "And turn up the gangway lights. This ship isn't a tomb yet." His mouth was drawn to a thin hard line. There was a buzzing sound when the cell lock was opened, and then they heard the cell door slide shut a few minutes later.

Corcelli stuck his head into the passage, and saw the mauki floating up the metal tube, fast. He ducked inside, as she grabbed the doorsill, and swung into the control center.

"Sir, you sent for me?" She was dark haired, maybe about twenty-eight, with very fine features. Nothing freakish about her.

"Yes. I want some information about the IDs." The mauki grabbed a sitting bar, and looked at the major steadily. "Tell us about the IDs," he said.

The mauki's dark eyes widened a little. "You *really* want to know?"

Hopkins nodded, and Corcelli studied the major's expression very closely. Just a trace of smugness behind the bitterness.

"There is a song," the mauki explained, "which tells the history very well."

Hopkins leaned back on the G-couch, his hollow face hard and white.

The mauki began:

First was hard bright burning light
Then long months of outward flight
Out to far aphelion
By the orbit of our earth
Out from perihelion
Inside the inner ring
Where hull plates sing

Then there was the gravi-braking
Weary clumsy orbit making—

They listened. There was a strange shifting tempo to the song, because the mauki wasn't singing, but just

talking. It was word magic, rise and fall, intensification and inflection. The mauki bared the history of the IDs to them, the mutants—

Swollen bodies, crumbled minds
Freaks and monsters
Mutants deaf and sick and blind—

The formation of OSI, the inspection—

Then the curse came, bitter exile
Ultimatum. Live a while
In a paralyzed ellipse
Prisoners of justice
In three weary, leaky ships
Till the yeast and algae mola
And the ships grow cold.

This ID history was different than they had ever heard before. It was the ID's side of the story.

All infants born in Space are IDs
A single static rote that rids
The earth of interest in us
And out in Space we lived
Air bleeding in the emptiness
Measured food and measured air
Measured years to death we share.

She told of the sudden wave of normal births—

Little freaklings sickened, died
Little ID-lings lived and grew

The wasted pleas for the lives of the ID-lings, the attack on the inspection rocket, the escape,

In the three ships, silent waiting
Weary exiles tired of hating
Ended mission
Nothing left
A-bomb sections change position
Molecollision
Nuclear fission.
A fleeing spaceship. Behind a light.
Only silent empty night
Asteroid Rings our hiding place
In the barren wastes
And outer depths of Space
Living, dying
Multiplying.

Her voice drifted down the still passageways of the huge spacesphere, clutching at their souls, lifting buried feelings from disciplined death, breathing the past of a hunted race eking out a bare existence from the cold rocks of the Rings. Then the great ID-human wars, and

Earthlings labor, cursing, praying
Stream to battle undelaying
Torn from air and soil
Out to Space
Worn by weightlessness and toil
Angry world
Spaceward hurled.

She traced the wars, the battles, the futility, the sorrow. Then the tone shifted slightly.

Hate and hunt and harry. Why?
Man has land, and ID has sky
To each his own
In peace
Each to his own
End the hate
Night grows late.

"All right, that's enough of *that*," Hopkins snapped quickly. But his voice went unheard. The mauki threw her head back, and *sang* the last verse, her voice reaching down the gangways. It wasn't the loudness, it was something in the overtones, making the thin metal walls hum in resonance, trebling, clear, rich, *commanding*—

Let our wish be understood
A treaty, truce, a brotherhood
Now, to save the race
Worlds were made for men
IDs were born for Space
Let ID ships roam
Now. Orbit home.

"Shut up!" Hopkins snarled. He started halfway out of his G-couch, but the mauki shook her head, and pressed her finger to her lips in a gesture of silence. The major stopped in surprise, and then settled back on the edge of the couch.

"We've heard enough of your lies," he said. He noticed that no one was listening to him. "ATTENTION!" he roared, his voice breaking almost into a shriek. Heads snapped to stiff attention. "You will disregard everything you have heard this woman say. As you know from your basic education, it is all lies. Stupid emotional stuff."

"Sir." The major stopped. "I feel very sorry for you, sir," the mauki said. The major's eyes narrowed, and he stiffened on the edge of his seat.

"You feel sorry for *me?*"

"You've never been in love, have you?"

"What does that have to do with it? With the ID war?" The mauki shrugged, and looked at the other officers. Hopkins saw how they were watching her, realized the force of her personality. "Whatever I may be," he snapped sarcastically, "at least I'm not a *freak lover!*" The mauki colored hotly, her full mouth suddenly hard.

"My husband is neither a freak, nor a baby-killing *coward,* like *you,*" she said, her voice angry. Hopkins studied her for a long minute, jerked out of his seat, and hit her right in the face as hard as he could.

Two days they waited. Full alert, on cocaine and benzedrine, men like robots, gaunt, weary. Two days they snuggled against the huge black meteorite, watching the ID scooter drifting in the wan sunlight. Two days and nothing.

Corcelli looked at his bloodshot eyes in the mirror. He wondered whether Hopkins had finally blown his fuses, keeping the full complement on alert. And why that interview with the mauki? No reason for that at all. Maybe he had a reason, but whatever he'd had in mind seemed to have fallen flat. And hitting the woman. Not so good.

Hopkins had split his knuckles hitting her. And the mauki lost three teeth. No reason at all.

"Corcelli. Check radar." Corcelli saluted, and kicked up to the radar sector.

"Anything?" he asked. The reader shook his head. The captain checked the recording strips. It was just as if Space had suddenly frozen. With millions of skew orbitted chunks swinging through the Rings, it was impossible that something shouldn't go by once in a while. But nothing. The screen was black except for the scooter and a few orbit-locked chunks kilos away. There was something weird about the whole thing. But nothing had happened for two days.

Except the chant. It stopped and started and stopped. Over and over. It wasn't words, just a chant, sounds, high, low, muffled, ringing. They knew it was the mauki, but somehow the sound was hard to place. Sometimes it seemed to come from the walls, sometimes from the spherical hull. Voice tricks.

"Tell that woman to shut up," Hopkins ordered. But no one told her. And the major didn't go near the cell himself. Corcelli waited till a silent moment, and, passing, pushed in a water canister through the bars. There was no one in the passageway. He paused to look in. The mauki was crouched in the corner, balanced indifferently against the bulkhead. She looked up, her eyes cold.

"Is it poisoned?" she asked. He shook his head.

"No," he said, "it's—"

"Corcelli! What are you doing?" It was the major, and he was kicking down the gangway hell for leather. "Are you talking to that mauki?" Hopkins demanded.

"Yes, sir." He didn't like the drawn look in Hopkins' face.

"What did you push in there?"

"Water, sir. She hasn't had any food or water for three days."

"I'll court-martial you for that. Get it back."

Corcelli stiffened suddenly. "No, sir. You can't treat any prisoner like that. She's human."

Hopkins pushed him aside roughly, and pushed the lock button, and inserted the key.

"I'll get that back, if I have to make her vomit it up."

The mauki got up quickly, and pushed the canister back out through the bars. Hopkins grabbed it, and hung there weightlessly, glaring at her, cursing, shaking with rage.

And the mauki laughed.

"Don't open that door." Corcelli warned. "You touch that woman, and I'll call a Space Court, and have you relieved of your command for insanity. *That's* in the Space Manual, if you remember."

"Space lawyer, eh?" But Hopkins didn't open the door. He pulled the key out, and glowered at Corcelli. "I'll include this on your record," he threatened. Corcelli brushed past him hostilely, and kicked up the gangway.

The chant began again.

It was just before the watch change that the radar went. The chant—they called it the "mauki chant"—was a throaty trill, almost at the upper limit of hearing, hanging like an anguished violin note, and penetrating. There was an odd quality to the notes, so penetrating that the walls whined, and trembled to the touch. Then the radar set blew.

The blowout was peculiar, a sudden series of pops, and no radar. It was the tubes. A half dozen of the same type tubes had shattered. They weren't hot, and the connections all looked O.K.

"Replace them," Hopkins said. The technician shook his head.

"We can't. We only have three

spares. We'll have to run blind until we get new ones. The radar won't work."

Hopkins felt around in the maze of wires and tubes. "What broke them?"

"I don't know. They all seem to have shattered about the same time."

Hopkins touched several of the tubes lightly, and felt them hum under his fingertips. "What could make these tubes hum," he asked.

The technician put a hand on them and looked up. "I don't know. They shouldn't." He looked in again, and felt the frame and connections. "There's no reason for them to hum."

Hopkins looked at the officers and crewmen, his face hard, his mouth twisted into a bitter sneer. "The radar goes and we're sitting here helpless, and *none* of you knows what shattered the tubes?" There was no answer. "We could be sheared in two by a meteorite, or caught in an ID attack — and not know it was coming." The sneer was almost a smile. "Did any of you ever see someone shatter a fine glass by hitting a certain chord on the piano, or violin?" There was a murmur.

"You've heard of such things, haven't you? Know what it's called?"

"Resonance," Corcelli said.

"Right. Resonance. Sound vibrations at the natural frequency of the shattered glass. Over and over. Intensification. Know what happens then?"

"Increased amplitude."

"Right. Increased amplitude, crystal fatigue, and disintegration. Which is what happened to the tubes. Something in this ship was vibrating at the resonant frequency of the shattered tubes, and *is* vibrating *now* at the natural frequency of those other tubes." The glass had a definite whine. Hopkins damped one, smothering it with his hand. "Notice," he said, "that the destruction is to *similar* tubes, which means we can't replace all of them."

"But what's causing this vibration?" the technician asked. Hopkins looked around at them coldly.

"Just *listen,*" he said. They listened tensely, and—

The mauki chant.

Pop! A shrill whine. Dull popping noises. Fragments of glass suddenly splattering against the walls. Sizzling crackling current and a shower of sparks.

"The lights! What happened to the lights?" There was a yelp in the darkness, the men shoved and squirmed, helpless, weightless, clawing for the walls, shouting.

"Shut up!" Hopkins barked. "Attention! ATTENTION!" His voice rose above the burble of their panicked cries. No one listened. Kicks, elbowing, cursing. Hopkins caught a knee in the ribs. All jammed in the cramped compartment, trying to get out, blind, scared. "I'll shoot the next man who makes a move," Hopkins warned. Something kicked violently against his face.

The mauki chant stopped suddenly.

The noise, the scuffling, the struggling, shouting, died out gradually. The ship was suddenly as still as a tomb, everybody listening, waiting, expecting—

"Man your battle stations," Hopkins ordered, his voice icy calm. "Spacesuit crews assemble and suit. We're going to spread a visio-alarm system out around the ship. This is an attack!" The men started to move to their posts, feeling their way along the gangways in the darkness. The panic had died out, and there was a disciplined efficiency in their movements.

The mauki began to sing again, very softly. And the men moved very quietly so they could hear—

Wives that wait and silent weep
Men that outward spin through deep
Unresisting void and glide
Cross the system, onward ride
Inward, faster, maximum.
Gravi-braking, home they come

"Open the weapons stores. Man all recoilless rifle turrets," Hopkins barked, his hard flat voice a harsh countertone to the mauki's Lorelei wail.

What good tears when hearts are cold?
Going boys, returning old
Grim and bitter, hardened men.
Home, then out to Space again.

"That *voice,*" Corcelli breathed. It was a half sob, half battle shout, going up, up—

"Twelve hours oxygen for each suit," Hopkins snapped. "And rocket torpedoes, the IDs may come in big ships." His voice had the rapid staccato for a drill commander. Emotionless.

Life a chain of quick good-byes
Thrusting upwards to the skies
Meetings, partings, sadness, pain.
Home, then out to Space again.

A voice reaching out at them in the darkness, pleading.

"Shoot that woman," Hopkins shouted.

"It's too dark, they can't see her," Corcelli reminded him. "They'll only perforate the hull."

"I'll shoot her myself. I have a portable light in my cabin. I'll take care of her as soon as I get this warning team out."

That voice again, louder, insistently. The hatch to the space lock slammed.

Earthlings, shape your orbits home
You were never meant for Space
We were born to ride the night
Howling down a lonesome flight
Feeling Space with eyes and mind
Earthlings, back! Your eyes are blind.

The pumps clicked, the air pressure dropped. The mauki's voice hunted down the passageways, curved into the turrets, filled the darkness.

Build your cities, till your soil
Sweat, and understand your toil.
Keep your roots deep in the ground
Watch the sun and stars go round
Never really knowing why.

"Use your line-of-sight microwave for communication," Hopkins snapped into the radio speaker. The space lock hatch slid open.

We are dwellers of the sky
You have nothing here to gain
Only fear and haunting pain
Tortured lonely thoughts remain.
Back! Go back while you are sane.

Twelve chemical rocket motors flared in the night. Hopkins and Corcelli watched them drift away, wink out.

Earthlings, shape your orbits home.

The ship was still when they came back from Hopkins' cabin. His portable lamp was shattered too, like every other light tube on the ship. Hopkins planned to use a torch, and he carried the papers, old charts, rolled in one hand, a pistol in the other.

"Those sentries will give us as good a warning as the radar would have," he said. "Even better, because the ID ships can't slip up behind that rock chunk we're hiding by. That's our only blind spot, and they'd have to be inside a close cone to be out of tracking. We've had the approach covered since we locked in by this rock." They slid down the passageway toward the brig. They brushed past the deserted sleep sectors, conscious of the black stillness.

"It would be too bad if those IDs had been inside the dead cone when we took our first radar reading—" Corcelli mumbled.

"They couldn't have been. They would have attacked us long ago." There was a metallic snicker ahead of them in the darkness.

"Why?" asked Corcelli. There was a faint squeak. "Hey, is that the space lock?"

A bright searing white light exploded in his face. He moaned and clamped his hands over his eyes. A painfully brilliant afterimage persisted. There was a thud near him. Something grabbed him.

"Not that one. That's Corcelli," a voice said. It was muffled, metallic, like it was coming through the vibrator of a spacesuit. He was dragged down the passage toward the brig.

"Mauk?" the man in the spacesuit called. The mauki answered. Corcelli realized sickeningly that the IDs were aboard. He made a frenzied attempt to escape, but the metal claws of the spacesuit held him.

"Don't struggle, Corcelli. We won't hurt you," the mauki said. He tried to yell, but the plastic arm of a spacesuit clamped over his mouth before he could make a sound. "Don't," the mauki hissed. "If you scream, we may have to kill people." If he could only see. The mauki was talking to one of the IDs. "We *must* see that this group gets back to Terra. They know enough to *live.*" He was held helpless for about ten minutes while there were soft noises

all over the ship. IDs slipping up and down the passageway, poking into the sectors and compartments, doing *—something.*

The mauki and the ID who was holding him were talking.

"The boy?" she asked.

"We had a pressure bubble sealed outside the lock. We had him inside as soon as the hatch opened. And a dummy ready in case they waited around to look for his body. It went very smoothly."

"I told these men about—us. Our people. It may be the first step, getting them back to Terra, and talking —" the mauki said. "This way is better than fighting, even if it is more dangerous."

There was a dull clicking in the gangway. The ID let him go, and he heard the brig door slam. The afterimage had turned to a dancing black blot. He tried to open his eyes. The ship was restfully dark, and still, unbearably still, just as if nothing had happened. There was a faint squeak as the air lock shut. He tried the brig door, and it opened. There was a clicking, very faint, of the air pumps, and then the outer hatch opened. He could barely hear it, ear pressed against the metal wall, sliding open. *Clank, clank* of magnetic boots on the hull, and then, they were —gone.

Hopkins was slumped in the corner of the brig, unconscious. By the light of the paper torch, Corcelli saw the major's mouth bloody, and bruised, his jaw broken. Four of his teeth were knocked out.

"An eye for an eye—" Corcelli mumbled. He revived the major, and they went to the dispensary. The doctor gave him a local, and did the necessary dental work by the dim light of a microportable.

"How'd it happen?" the doctor asked.

"The IDs—" Corcelli began. Hopkins jabbed him sharply in the ribs.

"We pushed the mauki out the space lock," Hopkins said. "I got kicked in the face. I didn't want to shoot her because of perforating the hull." His voice was garbled by the novocaine and metal clamps on his shattered jaw.

"But—"

Hopkins grabbed him by the arm, and pulled him into the passageway. "Listen," Hopkins said tensely, confidentially, "they don't even *know* the IDs were aboard."

"So—"

"Look, Corcelli," the major said, "if it ever gets out that the IDs got on board, it means my job. My whole career washed up." Hopkins' voice was friendly, confidential. "We'll make a quick inspection," he suggested, "and if the IDs didn't steal anything, what's the difference? Nobody has to know—" His voice was almost whining. "You don't want me to have to swear you attacked me and let the mauki go, do you?" he warned insidiously. "Your word against mine . . . a quick Space trial." His pistol poked into Corcelli's ribs.

"O.K., O.K., if you think you can swing it."

"That's the way, be smart," Hopkins said. They moved swiftly down the passageway, poking around with the microflash, looking, feeling, probing.

The IDs had come and gone without leaving a trace. Nothing was stolen or broken. The locked compartments in the control cabin were the only things that were tampered with. The IDs, they realized, had photographed all the codes and plans.

"So what," Hopkins said. "They never work anyway." The radar was still out, and the lights, but he had the twelve spacesuited sentries recalled by radio. None of them had seen anything.

"We can get the ship back all right. Our other instruments are working. And it'll be dark so they can't notice any trace of the IDs being on board." Corcelli nodded in the dimly lit cabin. Play along with this lunatic till they contacted the exchange station, and he could turn in the report, and have Hopkins arrested. Out in Space it would be mutiny. Play along.

"What idiots we were," Hopkins mumbled. "They were hiding on the other side of that big rock we're riding with. Two days they hid there, till the mauki blew the lights."

"Three days," Corcelli corrected. "And the little ID-ling isn't dead," he added comfortingly. Hopkins glowered at him.

"The only thing that puzzles me is why they waited. I think the

mauki must have had a sonic in the brig with her to shatter the lights, but I can't figure out why they waited three days. What did they gain by it?"

"The songs, maybe," Corcelli suggested.

Hopkins shook his head. "You're crazy. That's just a lot of stupid emotional stuff. Nobody will ever remember that junk."

"Well, I don't—"

"Just remember to keep your mouth shut about those IDs." Then Hopkins' tone became friendly. "If everything goes off smoothly, I might put a recommendation for a promotion on your record." The major kicked into the gangway.

"Great." *Everything* went on his record—

An idea jabbed out of his memory.

The recorder—

He was across the cabin in a second. Still running! The endless tape had been running through the recorder for two days. He turned it off, then turned up the replay, very softly—

Out on your jets, thunderer
Your jets, your jets
That squealing scream—

It was there! Every word in the past two days. He ran the tape ahead.

Do you hate the taste
Of tank-grown food
And hate this hell
Of—

Bring that woman up here. And turn up the gang . . .

You really want to know? There is a . . .

Ultimatum. Live a while
In a paralyzed ellipse
Prisoners of justice
In three weary leaky ships . . .

All right, that's enough of that . . .

Worlds were made for men
IDs were born for Space
Let ID ships roam
Now. Orbit home.

You feel sorry for me?
. . . nor a baby-killing coward like you . . .

It was all there. Every word. The screams, the panic, the silence, the mauki chant, the argument and threat when he tried to give the mauki a drink, the ID attack. The recorder was supersensitive. It picked up every trickle of sound, stuff their ears wouldn't notice. It would have an indelible record of Hopkins' offer to him.

That made the Space trial a sure thing. There had never been a mutiny trial *against* a commander before in the OSI. But this way—

He listened to a whisper of sound again. The cathode tube showed an ultrasonic trace. The mauki *had* used a sonic. But that *voice*—

Earthlings, shape your orbits home
You were never meant for Space—

The tape was more than just sounds. It was a story, a two-day story of Man and Space.

We were born to ride the night
Howling down a lonesome flight
Feeling Space with eyes and mind
Earthlings, back! Your—

A story of the IDs. And terror, fear, hate, and madness.

We are dwellers of the sky
You have nothing here to gain
Only haunting fear and pain
Tortured lonely thoughts remain—

If that tape was played in the trial, even the iron wall of OSI secrecy wouldn't be able to keep it all in. Mutiny, panic, ID attack—every second of the two days. Those songs would spread, either through news channels, or more slowly, by word of mouth.

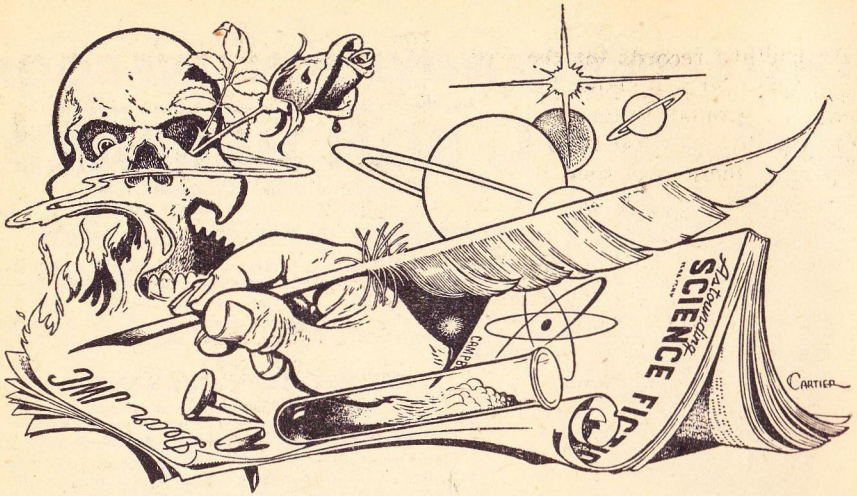
Back! Go back while you are sane.
Earthlings, shape your orbits home.

He lifted the tape out of the machine, and wound it around his body. As long as he was alive—

The trial would be big, a Grand Space Court. The tape would be listened to, and a lot more people would know enough to live. Corcelli smiled.

That was what the mauki wanted.

THE END



BRASS TACKS

Dear Mr. Campbell:

The February issue was enough to gladden the heart of an old-time reader. In spite of the general rise in the quality of science-fiction, in spite of the somewhat pretentious claims of certain competitors, there's still only one ASF, and no one else has ever achieved the peculiar indefinable flavor. There's a lot to be said for a tradition, and you have one.

The stories rate as follows with me:

(1) "I Tell You Three Times": Jones is always good.

(2) "Historical Note": Amusing, though not too believable. Where did the energy to propel those gadgets come from? Also, I can't quite imagine the Soviet Union making their existence public. More likely they'd clamp down tight secrecy and save the fliers for a surprise assault. Still —if only it could happen as Leinster described it!

(3) "The Friendly Man": Promising new name with a good idea.

(4) "Assignment in the Unknown."

(5) "Hideaway."

(6) "Fair Prey."

(7) "Franchise."

The last four were all stock, but well handled. Article interesting. What other magazine could get one by Edmund Berkeley?

Poul Anderson's letter calls for more extensive comment. As to his remarks on population pressure, I must on the whole agree, but he seems to go too far and does make several definitely wrong statements. For one thing, we *are* eating better now than in the past, as Department

of Agriculture records for the past fifty years or so will show. For another, the ground water problem, while admittedly a tough one, can be licked; there are several new approaches in use right now which are pretty successful. There are also large undeveloped land areas even in Europe, China, and India, perfectly arable but not in use because large landowners hold them or because illiterate populations always hate to migrate since it means being completely cut off from the old homestead. Nevertheless, the problem is serious and needs a lot of heavy thinking and rational action.

His inquiry about the works of Oskar Haeml is somewhat surprising to me, since the name is almost unknown even among professional philosophers and logicians. Haeml was Swiss, died in 1944 I think, and was probably one of the most extraordinary intellects of all time. He was interested in linguistics, and went from there to problems of epistemology: how do we know what we know, and what is it we know anyway? All that any individual man has is a collection of private data, "external" from the senses and "internal" from subjective reactions, instinct-patterns, et cetera. We must assume that the objective outer world is, in Russell's phrase, a logical construction from these data, unless we are willing to introduce sheer metaphysics which Haeml was not. This does not mean that the outer world is subjective, only that all knowledge we can possibly have

of it is subjective. But then how valid are our conclusions? Would beings possessed of different sense-organs, instincts, and the like construct a picture of reality essentially the same as ours, or would they not?

To settle this problem, Haeml had to develop a perfectly generalized epistemology, much as mathematicians started with Euclid's system and went on to generalize geometry into a super-system including all geometries, Euclidean and non-Euclidean, as special cases. Haeml, like Peano in arithmetic, tried to lay bare the few essential axioms on which human epistemology is based. He developed a paramathematical notation to handle such problems and it is astonishing how easily many knotty logical and philosophical tangles are resolved by it. His ultimate conclusion was that such a set of axioms does exist, but any or all of them can be denied without logical inconsistency. Thus you get nonhuman epistemologies just as you can get non-Euclidean geometries. However, most of them will not fit the world as we know it; for instance, some deny the casual principle altogether, others permit only a finite degree of abstraction, et cetera. I think he finally came out with three that are applicable to the universe as we know it, but was unable to decide on empirical and logical grounds which of them we humans actually use since on the zero order of inference they all reduce to the same and are not much different until we get into rather high orders. Indeed, he suggests somewhere that our minds use all three more or less indiscriminately, to the vast confusion of our thought on the higher levels of abstraction.

Haeml seems to have been a very retiring man, not particularly anxious to push his ideas, which is one reason why, for all their importance, they are nearly lost today. (It's happened before. Think of Mendel and Frege, for example.) He does seem to have exerted considerable influence on the Vienna school of logical positivists; Carnap, especially, has quite a Haemlistic tone at times, though it may only be that such ideas were "in the air" during the twenties. He was for a time associated with Bohr in Copenhagen and made some valuable suggestions concerning the logical basis of the quantum theory. Unfortunately, he died before he could fully develop his system, and much of it has been collected from notes he left and is therefore incomplete and somewhat confusing. His refusal to use the standard notation of symbolic logic was probably another reason for the neglect of his work. Most of his essays were published in second-string continental periodicals and are almost impossible to obtain in this country. I know of only three books written by him: *"Sprache und Erkenntnislehre, Die Matematik des Begriff,"* and a collection of essays on a wide range of philosophical topics under the general title "Gedanken." All are long out of print, though I understand that sev-

eral small groups of enthusiasts in France, Holland, and Denmark are planning to revive them. The major authority on Haeml in this country is Riepe, now at Carleton.

Personally, I don't claim to have more than the most fragmentary understanding of his work, and if someone else could help me out I'd be only too grateful. It's saddening to think of something with such great theoretical and probably practical importance going lost.—John J. Tolbert, 1411 N. Bronson Street, Chicago 25, Illinois.

Hm-m-m — sounds interesting. "I know I know" is interesting but meaningless.

Dear Mr. Campbell:

Here is my two cents' worth concerning the February issue of ASF for the Analytical Laboratory. First off the bat, I'd like to comment on "Historical Note," by Murray Leinster. Very, very good. The plot was a novel one, and the extremely clever writing put it across with a bang, providing plenty of chuckles for the reader. In my opinion, more stories of this type should be included in your publication, for a little humor is appreciated by everyone. I still remember Hubbard's excellent "A Matter Of Matter," and, although I do not expect him to be doing any writing for quite a while, Leinster isn't up to his neck in Dianetics . . .

"I Tell You Three Times," by Raymond F. Jones. Another successful addition to Jones' long list of excellent stories. Not in the same class as "Discontinuity," but interesting enough to keep RFJ near the top of the list of fine writers. The only complaint I have is that too much space was used explaining the computing machine. But this is minor, and greatly overshadowed by the good points of the yarn.

"The Friendly Man," by a new writer (?), Gordon Dickson. Fine fare up to the next to the last paragraph, that "Don't curse me so!" spoiling the effect of the story for me. It should have been omitted or replaced by something more appropriate.

"Assignment In The Unknown," by Frank Quattrocchi, ranked fourth. Good secret-service type of story. Reminds me of some of the British Intelligence novels by Manning Coles.

"Hideaway" and "Fair Prey" rank equally in the number five spot, with "Hideaway" taking the edge, perhaps, because of its greater length.

A word about the cover: Excellent. That sums it up. Miller is a fine artist, doing particularly well on exteriors, and seems to be your replacement for Rogers, who has apparently departed for place or places unknown. Maybe the army got him. Keep Miller busy on covers as well as Cartier, for he also is distinctive in his work. I deem it a pity that he has done but one cover for ASF, for he has great talent in his color work as well as black and white. Orban, on the other hand, is outstanding only in color. So put him on the cover and let someone else do the inside illos. And while we're on the subject, why in the devil don't you print the illustrations on the page where the depicted incident is supposed to occur? I hate to see a picture ten pages before or after the episode has taken place. It seems to me that this could be accomplished with a minimum of effort.

A few issues back, Mr. Campbell, you warned your readers to be prepared for a change come autumn. The leaves have fallen and soon will begin to bud anew. I have seen no change. Maybe you intended to use a quality of paper superior to the type you use now? I think the foremost science fiction magazine would look very distinguished indeed printed on slick paper.

In conclusion, may I ask for some more "robot" stories by Asimov? They are one of your best series.—Whit Taylor, 903 West Oregon, Urbana, Illinois.

Asimov seems to be too busy hunting enzymes in cancer study to hunt up many robots.

———

Dear Mr. Campbell:

An author of a recent article in our magazine *RADIO ELECTRONICS* posed us—and your circulation department — a problem

which I thought you might find interesting. He forwarded to Astounding Science Fiction the larger part of his payment for an article in the magazine, wishing to assure that he would receive ASF for as long a period as possible, and feeling that in view of Australian exchange restrictions, he might never be able to make another remittance.

Although practical considerations would cause his subscription to run out in sixteen or seventeen years, the pure mathematicians on the staff assure me that his payment of $37.50 would mathematically assure him of a perpetual subscription. — Fred Shunaman, 368 61st Street, Brooklyn 20, New York, N. Y.

Mr. R. C. Garver
Street & Smith Publications, Inc.
P.O. Box 255, Cooper Station
New York 3, N. Y.

Dear Mr. Garver:

Your letter of January 5, 1951, addressed to Miss Angie Pascale, was turned over to me. At first I was rather surprised at the letter, as the answer to the problem "The subscription rates to ASF are 1 year $3.25; 2 years $6.00, including a fixed 75c per year for postage" seemed obvious. A little study, plus consultation with the circulation department, convinced me that it was not. We then turned it over to an associate from MIT, who reported that with the information given, there was no answer.

Things like that don't happen in

real life, so we tried our technical consultant, Mr. Queen, who got his mathematics the hard way. He reports that there are an infinite number of answers, some of which are, of course, absurd. Another absurd answer was given us by the stencil department, who stated that the sub would be entered for as long a period as the machines were coded, and the balance refunded. As Mr. Straede's sole objective was to get as long a subscription as possible, in view of the fact that this might be his only opportunity to subscribe to the magazine, on account of Australian exchange regulations, a refund would of course be the last things he would desire.

The solution which Mr. Queen considers most logical is "to assume —from the data—that the publisher is willing to pay an 18% dividend per year on any surplus left him" presumably in view of having the use of the capital and a lower cost of securing renewals. If he is content with a little more than half of that on a subscription for a longer period than two years, Mr. Queen then goes on to point out, the publisher will immediately deduct $3.25 to pay for the first year's subscription. Then each year, at the rate of a little less than 10%, the remaining capital will earn another $3.25, and the subscription will continue indefinitely.

I made a few calculations based on the $2.50 plus postage rate, rather than on the straight $3.25-2.75 as above. The terms of the subscription are $2.50 for the first year and $2.00 for the second. Presumably the publisher is willing to offer a cheaper rate in consideration of a longer subscription and for the additional capital placed at his disposal. Obviously the same considerations apply for 3-year and longer subscriptions, so it is reasonable to apply the same rate reduction. Thus the subscription for a number of years can be expressed as a simple geometrical series, in which the ratio is 0.8 of any previous year.

In this case it is found that the subscription sums up to $12.50 for an infinite number of years. However, there is a fixed postage fee of 75c per year. Thus we arrive at the term by subtracting $12.50 from $37.50 and dividing the remainder by 75c, giving a term of 32 years. This is, I believe, the correct solution as judged from the strict mathematical viewpoint.

However, if your magazine is ABC, a subscription cannot be listed as bona-fide unless at least 50% of the list price of an annual subscription is actually paid. In this case the geometrical ration applies for only four years, the last year's subscription being $1.28. Total subscription and postage for the four years totals $10.38. This is subtracted from $37.50, leaving a remainder of $27.12. Dividing this by $2.03, the new fixed price (1.28 + .75) gives us a little more than 13 years, which added to the 4, amounts to 17 years. This is possibly the most practical solution.

A method used by some publish-

ers (including ourselves) to prevent the rate from dropping to zero is to reduce progressively the discount for each additional year's subscription. Thus a magazine may have a rate of $2.50 for one year, $4.50 for two years, $5.75 for three years, cutting the discount in half each year. The rate would then level out to approach $1.50 in about ten years, with a sum of $16.98. Adding $7.50 as postage for the ten years, we have $24.48. The remainder of the subscription must be calculated at the fixed rate of $2.25 (includes postage). In this case the total subscription will run about 16 years.

In any case, I am sure that Mr. Straede will concur in any arrangement you may wish to make, to get his magazine for as long a period as possible without again having to hurdle Australian exchange regulations. As he is one of our older authors, I would personally be very grateful for any aid you may be able to give him in this direction.—Fred Shunaman.

All right, math sharks and businessmen get together!

———

Dear Mr. Campbell:

What do you think you're doing? You've loused me up again so much that I absolutely refuse to give a rating to the AnLab for the February issue.

No, no. It's no use. My mind is

made up so get off you're knees and quit begging me.

Roughly, as you no doubt have guessed by now, I thought the issue was mildly terrific. Of the stories there was only one that I wouldn't put at the top and that was "Hide-away." I just didn't get that ending.

Mr. Jones was his usual self—sensational—in "I Tell You Three Times."

Will (Murray Leinster) Jenkins had me in stitches literally holding my sides with "Historical Note." Let "us" see a little more of that style of writing from him—and soon.

"Fair Prey" had a simply neat idea in back of it.

Beautiful tension in "Assignment in the Unknown," building up to a startling climax.

"Franchise"—a short, short story with only one real idea in my estimation but entertaining. It's good not to have complicated plots all the time.

"The Friendly Man" had an ending I wasn't looking for or would have looked for in a million years. Which, of course, means I liked it. I liked its emotional impact, too.

Sorry I couldn't go into detail, but this guy right here is pressed for time.

Article arranged nicely, but there's something I didn't get. And I don't know what that "something" is.

Artistry for Miller, Cartier, and Orban—superior plus.

GRUDGE: I'd still like to know if the Howard Hawk production "The Thing" is a make of "Who Goes There?" by your alter ego, Don A. Stuart. (What does the "A" stand for anyway? "Atomic"?).

HINT: I'm always a sucker for a serial. Shall "we" put one in? Hm-m-m?

WHA HOPPENED? As usual I ask where's Miss Shiras and a "Wonder Children" story and a Heinlein "Future History" one.

Every story I've read by Poul Anderson I've considered tops. Shall "we" give him . . . no not another lead novelette . . . a serial?

How about Eric Frank Russell and the "old, missing personalities" I speak for every month—Hal Clement and Judith Merril especially?—Ronald Ferdie, 615 Santander Avenue, Coral Gables, Florida.

"Who Goes There?" is being movied; their answer to the question is "The Thing."

THE END

★ ★ ★ ★ ★

. . . for flights into the Fantastic

and the best in Mystery . . .

THE SHADOW

Listen . . .

Sunday afternoons

5:00 PM EASTERN TIME
4:00 PM CENTRAL TIME
3:00 PM MOUNTAIN TIME
2:00 PM PACIFIC TIME

over Mutual Broadcasting System

RELAX WITH A HOBBY!

ENJOY . . . EASY-TO-ASSEMBLE

Superbly Decorative, Exquisitely Detailed

COLLECTORS MINIATURES

Replicas of Old-Time

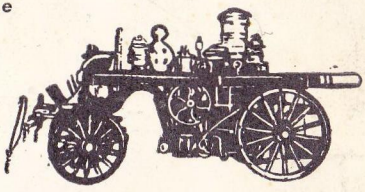
PRE-ASSEMBLED PLASTIC PLANE U-CONTROL IT WITH REAL TINY GAS ENGINE

$9.95

If you crave excitement for relaxation — 'pilot' your own AEROMITE — that's right YOU actually pilot this gas-powered speedster! Hedge-hop, loop, speed with nylon-thread controls-of-elevator you operate! 17" wing-spread, shock-absorbing model! ALL COMPLETE, ready-to-fly — including complete instructions. ½ pt. fuel 50¢.

FIRE ENGINES

'Unwind' yourself with this fascinating pastime of reconstructing nostalgic miniatures of fire 'masheens'! Model-range goes back to days when George Washington was a volunteer fire-fighter!



PRE-FABRICATED Kits
Step-by-step instructions

Easy-to-follow, easy-to-assemble! Finished miniature is proud display for mantle, den or office!

CITY SERV. LADDER	$4.00
HOSE WAGON	2.50
HOSE REEL	2.00
AERIAL LADDER	5.25
COMB. CHEM. WAGON	3.50
CHEM. & REEL CARTS (2)	2.25
HORSES (2) HARNESSED	2.25
STEAMER	6.50

'Vintage' Models — ¾" scale 6½" to 10" long

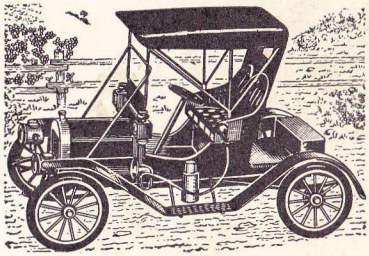
OLD-TIME CARS

These take you 'way-back' to around the turn of the century. Precious 'conversation-pieces' — magnificent decorations — fascinating to assemble from step-by-step, illus. instruction-plans.

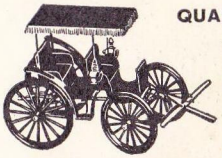
Smooth, speedy assembly from PRE-FABRICATED KITS

Ready-shaped parts, cast wheels, radiators, lights, horns, etc. Every famous old-timer represented.

23 OLD TIME AND *SMALLSTER KITS — *'08 Baker Elec. $2.65, *'09 Hupmobile $2.65, *'04 Cadillac $2.10, *'05 Reo $2.65, *'05 White Steamer $3.10, *EMF '09 3 in 1 $3.10, *'09 EMF Racer $2.65, '09 Stanley Steamer $3.10, '09 Model T Ford $3.10, '06 Locomobile $4.10, '10 Intl. Harvester $3.10, '03 Cadillac $2.65, '00 Packard $2.65, '03 Rambler $2.65, '10 Model T Ford $2.65, '13 Mercer Raceabout $4.10, '02 Franklin $2.65, '06 Columbia Elect. $2.65. All Prices Include Postage for Delivery.



QUAINT CARRIAGES OF YESTERYEAR

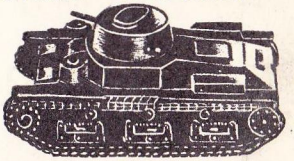


No detail omitted! Cut-to-size, semi-finished parts! SURREY-with-FRINGE-ON-TOP $1.75; VICTORIA (Illus.) $2.35; BROUGHAM $1.95; HANSOM CAB $1.50

ALL METAL-CAST, 1" to 108"

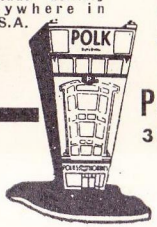
TANKS OF ALL NATIONS

Exciting ALL FINISHED mementos of famous land battle-wagons. Super-detailed down to revolving gun-turrets, rivets, etc.



NOTE: All prices include delivery anywhere in U.S.A.

Gen. Patton	$2.00	Satlin II	$1.75	Lloyd (Mark VI)	$1.10
King Kong	2.00	Stalin III	2.00	Churchill II	$1.35
Gen. Sherman	1.50	KV-2 (Hvy.)	1.75	Covenanter	1.35
Gen. Chaffee	1.50	STZ	1.25	Sherman	1.50
Willys Jeep	1.75	T-34 (Hvy.)	1.50	Cromwell	1.35
LVT	2.00	T-70 (Light)	1.35	Daimler	1.25
Weasel	1.50			Inf. Tank	1.25



VISIT POLKS

Hobby Dept. Store

Everything for hobbyists: Historic Ship Models, Trains (all gauges) Planes, Soldiers, Toys, Handicrafts & Artists' Materials.

CATALOGS
- ☐ SHIP MODELS (Ready Aug.) 50¢
- ☐ AMERICANA (Vehicles) 15¢
- ☐ TRAINS (HO-TRIX) 15¢
- ☐ HOBBY BOOKS 15¢

POLK MODEL CRAFT HOBBIES, INC.

314 Fifth Ave. (Dept SF-15), New York 1, N. Y.

(32nd St.), Open daily 'til 6; Thurs 9 P. M.