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# Astounding SCIENCE FICTION

Trade Secret by RAYMOND F. JONES



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Editor: JOHN W. CAMPBELL, JR.

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COVER BY SAM ANDRÉ • Illustrations by Freas, Miller, Sussman, and van Dongen

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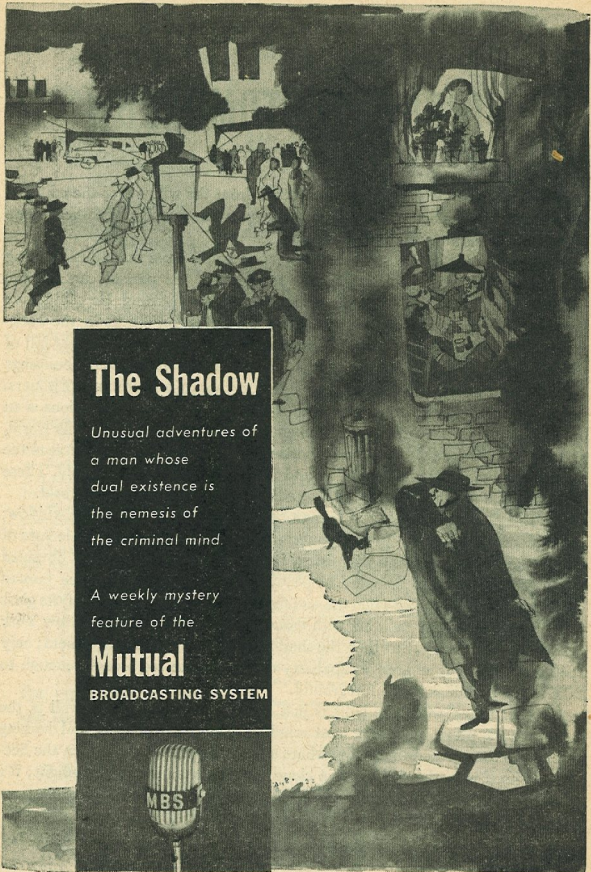
*Astounding* SCIENCE FICTION published monthly by Street & Smith Publications, Incorporated at 575 Madison Avenue, New York 22, New York. Gerald H. Smith, President; Ralph K. Whittaker, Jr., Executive Vice President; Arthur P. Lawler, Vice President and Secretary; Thomas H. Kaiser, Treasurer. Copyright 1953 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. Entered as Second Class matter at the Post Office, New York, N. Y. Subscriptions \$3.50 for one year and \$6.00 for two years in United States and Possessions; \$4.00 for one year and \$7.00 for two years in Canada; \$4.75 for one year and \$8.00 for two years in Pan American Union, Philippine Islands and Spain. Elsewhere \$5.00 for one year and \$8.50 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.

\$3.50 per Year in U.S.A.

Printed in  the U.S.A.

35 cents per Copy

● NEXT ISSUE ON SALE November 18, 1953 ●



## The Shadow

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a man whose  
dual existence is  
the nemesis of  
the criminal mind.*

*A weekly mystery  
feature of the*

**Mutual**  
BROADCASTING SYSTEM



# WINDOW TO TOMORROW

This month's cover is a photograph taken from the window of the editorial office of Astounding Science Fiction; it happens we have one of the finest views of the United Nations that can be found.

An artist could, in one sense, do better; he could have made his painting without the industrial building in the foreground, the parked cars, or the builders' tool chests in front of the General Assembly building. He could have dropped out the barges on the river, and the industrial stacks in the background. He could, in other words, have moved the United Nations right out of this world. Just out of sight to the left is Welfare Island, where are the buildings that have, for many years, housed hospitals, psychotics, and criminal prisoners.

The artist would be wrong; the essence of a successful United Nations is an organization that sees clearly the immense industrial potential of this world, and sees, too, the sick, the insane, and the criminal, that sees and accepts the reality of these, adds understanding and judgment, and can act wisely. These things must be in the picture; the United Nations is *not* out of this world.

But this picture is not what a human being can see from that office window; the camera is too limited. Like any mechanical device, following simple laws of already-known physics and chemistry, it cannot match the results obtained by the infinitely more complex biophysics and biochemistry of the human organism. There are times when the setting sun paints the upper half of the glass wall of the Secretariat Building with flame red, while the skyline of New York is silhouetted in black. But then the shadows are too dark for the camera; only the immense brightness-range capability of the eye can see broadly enough to take in the buildings in the foreground.

At other times, when the light is just *so*, the whole great glass wall of the Secretariat appears to be one vast window, framed in marble, and looking through to some other dimension, where a fairy city lies. That's when the Secretariat itself is in the shadow of a cloud, and the city is in full sunlight; it's merely a trick of reflection, of course—but it does make the United Nations look like a window opening on a brighter, sunnier land.

THE EDITOR.

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# INTELLIGENCE TEST

Being in the business I am, I have an interest in considering the nature of intelligence in a somewhat broader sense than is required in ordinary work, such as testing school children or job applicants. What constitutes intelligence when we are considering alien creatures? What parts of ethics are universal, and what parts are merely local mores? And by "universal" in that sentence, I mean *universal*—not confined to Man alone, but valid for all the races of the cosmos?

I suggest that there are some laws of ethics that are not human, but Universal. Wayne Batteau and his Speculative Society group at Harvard sent me one little pair of statements that are decidedly revealing in that respect.

"You can't win." (The Law of Conservation of Energy.)

"You can't even break even." (Second Law of Thermodynamics.)

When you stop to think about it, that "You can't win," bears a strong resemblance to the old moral adage "You can't get something for nothing." If we consider that that is simply a human relations level expression of the Law of Conservation of Energy—why it is rather starkly

apparent that there are truly Universal laws of ethics!

But intelligence is needed to discover such factors—and we haven't yet worked out a decent definition, or measurement, of intelligence.

I've been looking over Lewis Terman's "The Genetics of Genius," Vol. II. This is a study of the eminent men from 1450 to 1850; a group of psychologists, under Terman's leadership, analyzed the available biographical data on these various eminent men, and from that data, sought to determine the probable intelligence quotient, or IQ, of the individuals.

It's evident that such a study can't yield any very accurate results; the psychologists weren't able to go back in time and give Isaac Newton an intelligence test when Newton was twelve years old. Obviously that, and only that, would allow them to get an accurate rating of Newton on their tests.

But the book is an accurate test of the *orientation and beliefs of the psychologists*. Given the data with which they worked—and it is given in the book—we can observe how the psychologists reacted to that data. Whatever it may say about Newton, of course, is highly uncertain—but



what the psychologists who studied the data concluded from it is specifically clear.

According to their studies and results, Newton, Galileo, Leonardo da Vinci, Faraday, Copernicus, Franklin, and most of the individuals whose names are household terms all showed an IQ below 140, the level conventionally rated as "genius."

The highest genius of the entire period, with an IQ of 190, was John Stuart Mill.

Copernicus is particularly worth studying in this respect; he was rated at IQ 105—five points above the dead-level of average.

Copernicus is most commonly known for his cosmological concepts—the heliocentric solar system. But Copernicus was a doctor of canon law, a doctor of medicine, a highly successful merchant, manager of a city, drew up a plan for the financial structure of his country which was adopted with success, and being a wise man, refused to publish his cosmological theories during his lifetime. (He was predicting one hundred per cent accurately on that; Galileo, who promulgated the doctrines Copernicus originated, got into precisely the difficulty Copernicus predicted, and avoided.)

Copernicus was a successful, widely talented man, who could do, and did, many different things, and did them outstandingly well.

But he is rated at IQ 105 because, during his childhood, he was not pre-

cocious. The Intelligence Quotient is based on the ratio between the "mental age" and the chronological age; it's mental age divided by chronological age, multiplied by one hundred. Copernicus, because during his boyhood he grew and acted like a boy, rates 105.

John Stuart Mill rated 190 because he could read Plato in the original Greek at seven; at five he was discussing the relative merits of Marlboro and Wellington as military leaders. He was, during his boyhood, acting like a young adult.

I suggest that if it is inappropriate for a young adult to act like a child, it may be equally inappropriate for a child to act like a young adult. In that case, an extremely high IQ—precocity index is what it actually is—would indicate a high degree of neurosis. John Stuart Mill was certainly a neurotic individual. Copernicus, evidently, was not.

The highest score ever made on any "intelligence test" was, I have heard, a score of 250, made by a chimpanzee.

It's perfectly understandable; it was a six-months-old chimp, being tested by manual dexterity tests intended for human babies. Since a chimpanzee matures far more rapidly than a human being, the chimpanzee at six months had achieved a level of neuromuscular co-ordination appropriate to an eighteen-month-old human baby.

Continued on Page 160

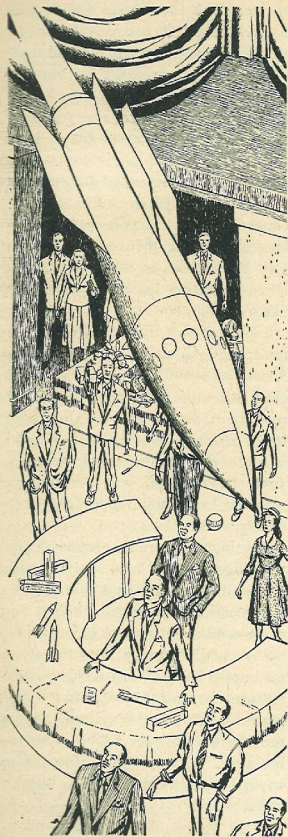
# TRADE

*The patent system was introduced to induce inventors to reveal their secrets—but it doesn't compel them. It's far from perfect, and if you had an unpatentable secret . . . what fur could be made to fly!*

Illustrated by H. R. van Dongen

Fashion model blondes wear mink in midsummer, magazine editors search for stories of snow and ice and old St. Nick, and Santa's little helpers gather themselves for the annual show of the National Toymen's Association.

Center lobby spots at the show are prize plums, and sometimes there's quite a tussle among Santa's jolly assistants to determine who gets the best spots. Dr. Martin Nagle, new to the trade, was somewhat dazed by the cutthroat techniques practiced among the builders of child-size death-ray guns and miniature furniture for little homemakers. But he had to have the center lobby space. Only in the open, away from the overhanging mezzanine, could he have adequate height for his own display. And so he got it, much to the astonishment of old and experienced hands in the rough and tumble toy business.



# SECRET

By RAYMOND F. JONES

He had only one toy, too, a circumstance which further annoyed his neighbors with big lines. It was a simple rocketship which rose from the floor, circled twice near the lobby ceiling, then drifted gently down with ports glowing and fire spitting from the tail jets.

Sam Marvenstein, president of Samar Toys, came across from his company's booth as the finishing touches were being put on the displays. He took the cigar from his mouth and glanced up as the miniature spaceship made its second turn and began descending.

"Makes a nice display," said Sam critically, "but it'll never sell. You can't expect the merchandiser to put in a big, high-ceilinged display of this kind. A few of the big city places will rig up a set of wires like you got here, sure, but not the little stores, and that's where you got to count on the big volume sales. And it's a cinch that kids' dads aren't going to be fooled into any elaborate rigging like that.

"Yeah, it looks real pretty up there," he admitted again. "You can hardly see the wires, even."

"Maybe that's because there aren't any," said Mart. "The ship rises and

descends on its own self-contained power, and is pre-set for steering."

"No wires, huh—" Sam entered the booth and passed a hand through the space beneath the descending ship. "Worse yet, then. Too bad, too. It could have been an awfully nice piece of merchandise."

"What's the matter with it now?" said Mart anxiously. "Why shouldn't it sell?"

"Fire hazard. No parent is going to let his kid have something flying around the house with fire spitting out the end of it like that. What kind of fuel do you use, anyway? Whatever it is, the fire underwriters are going to clamp down on you quick."

Sam Marvenstein shook his head sadly as the little rocket spun down to the floor with sparks pouring madly from its jets.

"Oh, that—" said Mart in relief. "That's just for show. We borrowed it from the toy train people. By increasing the intensity we get a nice simulation of rocket fire."

"Then how does it go? What kind of a trick are you selling, anyway?" said Sam almost belligerently.

Mart picked up a model lying on the counter and unscrewed the nose.

A nest of three flashlight batteries could be seen side by side in the interior. "Battery power," he said to Sam. "Three cells give approximately five hours of flying."

"Yeah . . . but how does that—?"

"Antigravity," said Mart. "A small antigravity unit is concealed in the tail under the batteries. The lever on the side of the ship is pre-set for the flight pattern desired. Very simple. Practically foolproof. We even guarantee them for three weeks."

Sam Marvenstein replaced the cigar in his mouth slowly. He picked up one of the toys and turned it end for end, squinting into the dark interior.

"Antigravity. Whadya know? Now that's really something. I used to read about that in the magazines my kid brings home, but I didn't know they had it out yet." He wandered away with the rocket in his hands to show his partners in his own booth. "Antigravity, that's really something, now—"

It *was* really something, as things turned out. Sam's comment was a feeble understatement, and the Nagle Rocket stole the show completely—along with quite a few thousands of dollars worth of orders that would have otherwise gone to the producers of more conventional toys.

By the second day of the show, the hotel lobby was somewhat like the interior of a poorly regulated

beehive. Rockets were taking off at all angles from the hands of delighted toy buyers. They banged the ceiling and soared over the mezzanine to collisions with rival exhibitors and other patrons. And Martin Nagle's pockets were stuffed with orders he couldn't possibly fill.

On the fourth day, Sam Marvenstein strolled over from his own nearly deserted booth and pressed through the crowd. Traffic regulations had been imposed by the hotel people so that no more than two rocketships could be in flight at any one time, and one of these was required to be launched by the proprietor of the exhibit. It made it difficult for Mart to accept the buyers' cash and write down the orders and fly the ships at the same time.

"Maybe I could help," said Sam. "There's not much doing over my way."

"That would be swell, but I don't want to take you away from your own show."

"Ah, it's nothing. People don't want to buy a mere rocket-firing jet plane today, anyway."

"All right. Just write down the people's orders and take their deposits while I keep the ships going."

The show closed at eleven that night. By then Sam was slightly staggered at the sum of the deposits he had taken in for Mart, and by the magnitude of the orders waiting to be filled. He multiplied that by

the four days of the show gone by, and added the sum for the remaining five. He wiped his brow and looked glumly across the lobby to the deserted Samar Toy Town, stacked high with rocket-firing jet planes.

He turned to Mart, who was straightening up the last of the rockets on the counter. "I've been looking up some dope about you, Doc," he said. "You're Dr. Martin Nagle, lately of West Coast University, and more recently of ONR. You have within the past six months set up an office as Basic Research Consultants, in partnership with one Dr. Kenneth Berkeley, psychologist. You don't own a toy factory, and have never been near one as far as I was able to find out. Now, your business is certainly your own, Doc, but I sure am interested in what you intend to do with orders for"—he glanced down at the paper on which he had done a little computing—"one million, four hundred and eighty-six thousand, one hundred and nineteen Nagle Rockets."

Mart straightened soberly. "It just so happens, Sam, that I have also done a little checking on you. I discover that the Samar Toy Plant is probably the best equipped and most modern plant of its kind in the country for producing toys of the complexity of my little rocket. It is also financially sound and respected in the industry. I'm sorry that people aren't buying rocket-firing jet fighters this season, but it seems to me that

a little expansion could convert the Samar plant to production of Nagle Rockets with profit to both of us. In short, the patents on the rockets are available for licensing to interested parties. And the contracts you have in your hand are for sale."

"I'm an interested party, Doc," said Sam. "I don't mind telling you that we counted on making it this year. We thought we had the merchandise that would do it. And we would have, if it hadn't been for you. No hard feelings, you understand, that's all part of the racket. How about a cup of coffee while we see if we can make a deal?"

Mart nodded. "Let me finish here. I think we can come to an agreement—but you should know, right from the start, that there is likely to be a rather large amount of contention stirred up by the appearance of the Nagle Rocket. It probably won't take very long, either."

It didn't. The newsmen, after making routine reports on the toy show, came back for a second look at the phenomenal Nagle Rocket. Science editors checked the basic patents on the toy, and for one day it made the front pages across the country. That same afternoon, Martin Nagle got the call he had been expecting from Washington. Kenneth Berkeley relayed it from their offices in Basic Research Consultants.

"As predicted," said Berk, "Keys

wants to have some words with you. You probably ought to go down tonight and see him first thing in the morning."

"Was he sore?"

"He would have been happier if I'd admitted robbing Fort Knox instead of telling him that the stories about the Nagle Rocket are true. He's going to shut us down and throw us behind bars for the rest of our lives—unless you can convince him we are innocent of national treachery."

"Maybe you ought to go instead. Or at least go with me. You knew him first. You persuaded him to open Project Levitation."

"No. He wants to see you. You're the physicist and he understands your language far better than mine, even though he did co-operate on Levitation. It's up to you, Mart."

"All right. I'll get started. We knew this was coming. The sooner it's over, the better."

"What about the booth? Shall I come down tomorrow?"

"No. Sam is here. It's practically his baby, anyway, since he's closed his own display and is working with me on conversion of his place to produce our rockets. I'll come over to the office on the way."

It was a gray Washington morning when Mart got off the train and took a taxi for the Office of National Research. As he reached the building,

marked by self-conscious newness, he had a moment of doubt about the wisdom of the thing he was doing. He had to have the trust and support of Keyes and other men like him, and now he was close to the thin edge of renunciation of all such trust.

He went directly to Keyes' office and the secretary kept him only a moment before ushering him in. Keyes had obviously been waiting. The director's face was dull and colorless, as he indicated a chair with abruptness bordering on the uncivil.

"I think I know all there is to know of this so-called toy of yours," he said, "but I'd rather hear it from your own lips. If there's any possible fragment of excuse to relieve the brand of treachery upon what you have done, I want to be the first to know it."

Mart felt a momentary overpowering fatigue. This was the moment he had dreaded—and the one he had not known how to avoid. He had gone over it a thousand times in his mind, but now he hesitated, trying to find the right word to begin.

"Berk and I—" he began. "No, leave Berk's name out of it. I'm speaking for myself, and I take full responsibility. For reasons of my own, I have left basic research and have gone into business—the toy manufacturing business. I told you at the completion of Project Levitation that I could not afford to remain with ONR, neither there nor at the

University. I have three children—and there may be more as time goes on—whose care and education I have to provide. I have a home to maintain for them and my wife and myself, which I have no desire to maintain on the fringe of desperation, wondering whether the mortgage payment can be made next month or not. I desire to maintain my home and family in adequate comfort and security.

“This I cannot do on any salary available to me at ONR or at any other Government agency or at the University. It was necessary to go into some suitable business to maintain my finances at the proper level. Some of my colleagues would perhaps consider the toy business trivial and incongruous with my past profession, but it will provide for my family in a way that research has never done or could do. The toy business is an honorable one and I have no apologies for it.”

“And I’m not asking for any!” said Keyes almost savagely. “All this is beside the point. The wastage of your own brilliant talent, the virtual betrayal of your profession are all matters that concern me not at all—although they once would have concerned me greatly.

“What matters now is that you have taken the results of the highly confidential research which you performed here at ONR, research which was vitally essential to the security

of our nation, and you have broadcast it to the whole world, including the very enemies we are bound to destroy in self-defense. You give it to them in the form of this miserable toy which you have marketed in order to buy a more sumptuous house, a better car, and perhaps a mink coat to bolster the ego of your wife and yourself.” Dr. Keyes clapped his hands to the top of the desk and leaned forward sharply, his face pleading momentarily. “Why, Martin? Why did you do it?”

Mart made no answer, and Keyes slumped back in his chair. “There are penalties, of course. They will be applied. But what rankles most is that you have given abroad even more than you gave here. You achieved the thing which we directly sought and did not find on Project Levitation, a low-capacity antigravity device. And you have given it, literally, to the enemy instead of preserving it for your own. Can you give me any explanation for such insanity?”

Mart inhaled deeply. “Yes. I can give you a great many answers in due time. But only a few of them now. First, I was granted a patent on the antigravity device used in my toy. Have you read that patent?”

Keyes held up the pile of papers at the side of the desk. “I have read nothing else but it and the news accounts in the last thirty-six hours!”

“You have noted, then, the very

precise specifications given in disclosing the mechanism of the toy. You have noted that the patent states this is based on a newly discovered Law of Nature."

"Indeed I have!" said Keyes bitterly. "And what Law of Nature may I assume it to be?"

"*Not* the one we found during Project Levitation!" said Mart in sudden intensity. "*Not* that one—do you understand what that means, Dr. Keyes? I have not betrayed the confidences and work of Project Levitation."

"That doesn't make sense. Project Levitation produced antigravity. You utilize the principle of antigravity in these toys of yours. Therefore you utilize the results of Project Levitation, which you were sworn to protect in all secrecy."

"No." Mart shook his head firmly. "There is more than just one principle. To make a crude analogy: One might produce a motor car powered by steam or electricity or gasoline engines. The car would perform the same operations, within limits, regardless of the type of power. Beyond those limits, of course, the similarity would vanish.

"So it is with Project Levitation and my little toy. You wanted us to find a means of building a Buck Rogers flying belt. We didn't do it, but we did find a means of powering thousand-ton airships and spaceships.

"No possible utilization of the

particular principle involved in the work of Project Levitation would produce a flying belt. On the other hand, my little toy, as described in the patent, will never be extrapolated to produce spaceships. Its maximum capacity is a little over two pounds, and cannot be scaled up. It is true that new, and at present unknown, designs based on this new Law of Nature can produce spaceships or flying belts—but they are not inherent in the Nagle Rocket toy. I have not violated the secrecy which I swore in connection with my work at ONR. I have not betrayed you. Believe me, I have not!"

"How can you defend such a position?" Keyes demanded. "All the world knows that antigravity is now available, in principle at least."

"You will note that I was careful not to state that principle in my patent disclosure. I could not patent the principle itself, of course, and it was not required to be disclosed, so it remains unknown."

"For how long? Without being the least bit prescient I can state that at this very moment a Nagle Rocket is being dissected in Moscow. Within days, or weeks at most, they will have the principle. From there they will go on to the larger principles of spaceship construction.

"Why, that thought was even part of the speech Berkeley prepared for me to give you at that first meeting



of Project Levitation. I said that since this fictitious Dunning had discovered antigravity from known scientific material one young Russian could do likewise!"

"Yes. And the key in your statement is the phrase 'known scientific material.' The Nagle Rocket is *not* based on what would be considered *known* scientific material. It is a second or even a third-order development. There is the crux of the matter. You might think upon that."

"Think of it—!" Keyes rose and strode suddenly to the window, his back to Mart. "I'm sick of thinking of it! You're not fools, you and Berkeley—" He turned abruptly and faced the physicist. "Berkeley . . . why didn't I think of that before? It's *his* doing! It's another one like Project Levitation! Tell me: is it?"

He strode back to Mart, forcing the physicist to rise to meet that face in which fear, anger, bewilderment and disappointment mingled in turmoil. "Is it?" Keyes demanded again. "I've got a right to know. I've got to know!"

"There are a score of principles," Mart said slowly, "perhaps even more, by which antigravity can be achieved, just as you can run an automobile by steam, electricity, or gas—or atomic power, if you choose.

"The very obvious conclusion that anyone is going to make is the one that you have made for yourself: that there is only one principle of

antigravity. When the Russians begin dissecting the Nagle Rocket, they will be searching for that *one* principle. They will scale up the little engine I have designed—and their laboratories will be demolished in the most curious kind of destruction. Implosion-explosion effects. Matter altered as to dimension and properties.

"*And they will not find the principle because it is a higher than first-order development of any science they know anything about!* Their search will take them farther and farther from the principles of Project Levitation. Rather than betray the Project, it will actively block revelation of its secrets. That, perhaps, you must take on trust for the moment. But it is true, I assure you."

"I would be an absolute fool to believe a word of that," said Keyes. He flung his hands aside in a gesture of loss. "But . . . almost . . . you leave me nothing else to do. If I accuse you openly of betraying us, the Russians will know for certain that we have a developed spaceship. If I believe you, I risk the entire future air and space development of the United States. I *will* believe you—if you will tell me one thing: Why?"

Mart shook his head slowly. "Not yet. I do not know if we shall succeed in this. If we fail, we shall try again. But if you knew our goal at this time I do not believe you would be willing to uphold us. That, we cannot risk. On the other hand, you cannot

risk believing I have been disloyal, because you know within yourself that it is not true."

## II.

The split with Keyes was Mart's major regret at the moment, but he knew that it was but the first of a long series of such incidents that would follow the promotion of the Nagle Rocket. Keyes, however, symbolized the whole class of unpleasant incidents and broken friendships that would occur. On Project Levitation, directed by Keyes at ONR the year before, Mart and Berk had worked to produce an antigravity device. And as a by-product they had developed an entirely new insight into the operation and workings of the human mind, and had produced fundamentally new methods of *thinking*. To exploit and explore what they found, they organized their own office of Basic Research Consultants.

As Mart left the ONR building, feeling the eyes of Keyes staring at him from the second-floor window, he was not at all sure of the wisdom of their present program. But it had all the qualities of a road full of burned bridges, and uncertainty was futile. Keyes at least would be quiescent for a time. As he had said, an open accusation now would tell the Russians that spaceships with antigravity propulsion were a fact, and Mart's explanation had

thrown him sufficiently off center so that it would take him time to plan any new and definite move. By then it wouldn't matter—

The sale of the toy rocket was not delayed until Christmas. It was pushed hard as soon as Sam Marvenstein's refitted plant was able to put it on store counters. At once it was seized upon by the country's small fry citizens as the successor to all horse and pistol paraphernalia and the pseudo rocket equipment with which they had been kidding themselves. This was the real thing. Re-orders flowed into the plant almost on the heels of the shipments going out.

Within two weeks of initial manufacture Sam Marvenstein was hopelessly behind schedule. He called Mart on the phone. "The toy business is like flowers and fresh vegetables," he said. "One minute you're in and the next minute you're out. One good item and a man can retire. A real blooper and you have to start all over again."

"What's the matter?" said Mart. "The rocket is selling, isn't it?"

"That's the trouble. It's selling *too* well."

"What are you talking about?"

"We need more factory space. We're behind far enough on the orders we've got now to warrant doubling our floor space. But how long can we sell rockets without



reaching the saturation point?

"It looks to me like Christmas would do it. If we turned them out, we could sell a rocket to every kid in the country above crawling age. So suppose we went ahead and increased our floor space with all the necessary jigs and dies—what happens afterwards? Can you give us a new item that will make the expansion worth while, or do you intend to be strictly a one-shot?"

"I won't be a one-shot," said Mart. "I've been thinking of the same problems. In the spring we'll have another little gadget to follow up the rocket. I think we should acquire

the increased space on a rental basis. Tool up to produce all the rockets the trade can stand. We can afford the capital investment and any subsequent loss on it."

"That's all I wanted to know," said Sam.

Although every news service in the country had given the Nagle Rocket a brief play, it was Joe Baird, the nightly TV columnist, who continued to pick at the bones of the story as if not satisfied that all the meat was out of it. Mart was never quite sure where Baird got his leads, but he was quite satisfied

to see the columnist's thin face and hear his somewhat squeaky voice announce with its full capacity for insinuation: "What former high-ranking Government scientist is now peddling toys for a living because Uncle's pay check wasn't big enough? This same scientist is scheduled shortly to be the subject of a series of investigations regarding his use of certain scientific principles for the production of toys instead of for the essential welfare of our nation. A big ripe, raspberry to the man who might be among the first to take his nation to the Moon—and is content merely to entertain the kids."

Mart had no idea whether Baird had inside information or whether he was shooting in the dark. At any rate his agitation was encouraging. It promised results.

The office of Nagle and Berkeley, Basic Research Consultants, was not one to attract customers in large numbers, or particularly before hours. But on the morning following Baird's denunciation Mart came down to open up and found a visitor waiting at the end of the long hall near the locked door of the office. The man was wearing a gray, slightly mashed felt hat and carried a brief case which he rested on the radiator as he looked out the window. Mart gave him a curious glance and fitted the key to the lock. Then he almost closed the door in the stranger's face as the latter hurried towards the office.

"I beg your pardon! I didn't know you were looking for our office."

"You are Dr. Martin Nagle?" the man said.

Mart nodded. "Toymaker extraordinary. Please come in."

"Very extraordinary, I would say." The man deposited his hat and offered his hand. "My name is Don Wolfe. I am chief engineer at Apex Aircraft. There are a few things I would like to talk over with you."

Mart smiled and led the way to his own office. "Please sit down. If you're here concerning the adaptability of the Nagle Rocket to aircraft propulsion, the answer is no. Not in its present form. And that being what you came to ask about I suppose you have had a long trip for nothing."

"No, I think not," said Wolfe. He laid his brief case on the corner of the desk and took the chair Mart indicated. "If I heard correctly you said, 'not in its present form.' I assume, then, that the mechanism has other and more adaptable forms."

"Might be. You said it, I didn't."

Wolfe frowned and hunched forward a trifle in his chair. "My company is prepared to negotiate very generously with you in the utilization of this device. Naturally, you have had and will have other offers. I would like to be assured of an equal footing with others, and in turn assure you that we believe we can meet the best of them. Naturally, I say this upon the basis of our

engineers' examination of your toy. We have no doubt that it is what you say: an antigravity device."

"I hope no one was hurt," said Mart.

"Huh? What do you mean?"

"I say, I hope no one was hurt when you tried to scale up the mechanism in order to increase its lifting power."

Wolfe flushed and glanced down at his hands. "We did have a small accident," he confessed. "No one was hurt, although much valuable equipment was destroyed."

"I'm glad that was all. You had no right, you understand, to alter this patented device for commercial purposes without due permission."

"We have the right to make improvements with a view to obtaining our own patents!"

"Of course. Of course," said Mart. "And you were able to make such improvements, I trust?"

"No, we have not," said Wolfe. And now the tone of his voice began to change. "I do not understand you, Dr. Nagle. I am here to make a legitimate offer. I am here to ask you to name your price for a license to your patents."

"Do you plan to go into the toy business?"

"Please, Dr. Nagle—"

"All right then. Listen to me: I have nothing to sell you. I have no patent that would be of any value

to you whatever. Have you taken the trouble to read the patent issued on the Nagle Rocket?"

The engineer nodded. "Practically committed it to memory."

"Then you have observed that the patent specifically details the precise mechanism that I have incorporated into my rocket toy. Nothing else. Is that clear? My patent covers nothing but that toy, and if you are not interested in toys, I have nothing to sell. I haven't anyway, because we're doing very nicely, thank you, with the present sale of the Nagle Rocket."

Wolfe moved his hands rather helplessly. "But antigravity, it—"

"It should be able to power airplanes—and even spaceships."

"Of course. You referred to a new Law of Nature in your patent. Obviously—"

"Yes. Obviously that is what you are interested in. But I'm afraid I can't sell you a Law of Nature. Nobody gets patents on such things. Unfortunately, that has to come under the classification of Trade Secret."

"That is hardly the attitude of the modern scientist towards his discoveries and his work," said Wolfe stiffly.

Mart shrugged. "It's *my* attitude. So now you know: The basic principle of the Nagle Rocket is completely unprotected. It is right there, lying wide open for you and your engineers to discover for yourselves. And when

you do discover it you can build kites or liners to Mars."

Wolfe made no move but continued to stare across the desk into the eyes of Martin Nagle. "You have a price," said Wolfe. "What is your figure?"

"Yes," Mart nodded slowly. "I have a price. But again, unfortunately, it is as unconventional as the rest of my attitude in this matter. It so happens that it is not denotable by figures."

Wolfe picked up his brief case then and rose abruptly to his feet. "I repeat, I do not understand you, Dr. Nagle. You have either an unmitigated conceit regarding your own abilities or you take the rest of us for fools. I assure you, however, that I will take you at your own word. I *shall* discover for myself whatever principle underlies your toy, and make whatever utilization I care to. But it would seem far more fitting if you exhibited a willingness to co-operate in the exploitation of this discovery—or at least presented a valid reason for not doing so."

Mart shrugged as he accompanied his visitor to the door. "It's your baby. Let's see you carry it off."

Upon opening the office with Kenneth Berkeley, Mart had intensified his contacts with fellow researchers and former students who now held responsible positions in nearly every major industry. His contacts led as well into every Government laboratory

employing specialists even remotely connected with basic physical research. As he expected, there began to be responses from these various points of communication. Among the first of these was one from Jennings out on the West Coast. Jennings had been with them on Levitation.

"The news of the Nagle and Berkeley enterprises," he wrote, "makes me yearn for the good old days of Project Levitation. I didn't know anything could be as foundationless as that project was when it started, but I believe you've topped it in that respect. The boys out here keep telling me you've gone off your rocker for sure, and I keep telling them you haven't. When you get around to it I would appreciate some evidence to back up my defense.

"P.S. Yes, the Nagle Rockets are getting so thick in the air over our subdivisions out here that midair collisions are not infrequent, with resulting claims and counterclaims of damages from one small fry to another. Have you any legal recommendations?"

"P.P.S. One corner of our physics lab was blown out the other day. Nobody got hurt, but some people are awfully mad. Seems to be some strong factions developing. There are those who would like to throw you in the clink, those who suggest you retire to the nearest booby hatch, and those who swear by all the windings of our local cyclotron that

they're going to figure out just what you've built into these gadgets. Also had a note from Keyes advising me to stay firmly shut up regarding Project L. I trust I may be among the first to receive enlightenment."

Mart chuckled as he showed the letter to Berk. "I can imagine what it must have cost Jennings to write that note," he said. "He'll go into a deep spin if he doesn't get the answer pretty soon. I imagine that out of all those we have stirred up he is the most likely to find the gimmick."

"How about that young fellow from Apex?" said Berk. "You said he was a pretty sharp type."

"He's an engineer. Whether that gives him more or less to overcome than a theoretical physicist I don't know. I suspect, however, that we'll be hearing again, one way or another, from Don Wolfe."

Through his technological grapevine Mart learned that by the end of the sixth week of rocket sales a specimen had been dissected in nearly every university lab and in every corporation with more than five hundred dollars a year to spend on basic research. He learned also that Sam had received an order directly from the United States Bureau of Standards for one dozen Nagle Rockets. He was even more pleased when the grapevine came up with the dope that they were actually for trans-shipment to an AEC lab, and that the Bureau had bought its own rockets at the local five and ten.

Letters and telephone calls reported an increasing frenzy building up in all these laboratories as the scientists tinkered with the little gadget, trying to find out its basis of operation and scale it up to useful load size. He didn't get too much from the AEC labs, but he was pretty sure the personnel there were participating in the maddening frustration reported from the Bureau of Standards and elsewhere.

With apprehension too, he waited for reports of injuries resulting from imprudent attacks on the problem. With evident good fortune, however, the grapevine had carried the news of the West Coast minor disasters and precautions were being taken. An occasional flash burn and destruction of carelessly placed equipment were all that came to his attention.

By Christmas the sale of the Nagle Rocket and the scientific frustration created by it had reached a peak. Joe Baird continued to throw occasional dark hints of vast, sinister doings on the part of the toy's creator. Sam Marvenstein had doubled the size of his plant not once but twice. Up to two days before Christmas he was shipping rockets in carload lots.

And then it was over. With the end of the Christmas season, the frantic production wheezed to a halt. Through the offices of St. Nick and Sam Marvenstein, virtually every potential customer for a Nagle Rocket had his wants satisfied.

The day after New Year's, Mart called Sam down to the offices of Research Consultants. As the manufacturer sat down by the desk, Mart handed him a cagelike dingus about six inches in diameter.

"The successor to the Nagle Rocket," Mart said.

Sam looked puzzled. He turned the contraption over in his hands a couple of times and shifted so the light from the window fell through the spaces between the wires to better advantage.

"I suppose it's really quite clever," sighed Sam. "But exactly what does it do?"

"We're tentatively calling it the Teleport," said Mart. "I imagine you can think up a name with more sales appeal. You may remember reading about teleportation in a science-fiction magazine you mentioned when we first met."

Sam's face brightened. "Sure . . . I remember now! That's the story where the fellow sends his girl across the country by radio and she comes out the other end twins so that everybody is happy and don't need to fight over her any more."

"Roughly," said Mart. "Just roughly. So here's what the gadget does. You see that this aluminum disk bisects the spherical cage and that a wire goes through the hole in the center of the disk. On one side there is a bead on the wire. Now I push the button at one pole of the sphere, where

the cage wires come together with the single wire through the middle. Now the bead is on the other side of the disk."

He handed the gadget back to Sam. "Try it yourself. Press the little button at the pole of the sphere."

Sam took it again, a look of disappointment verging on repugnance showing on his face. "I don't get it," he said. "There's nothing to that. Pushing a bead along the wire that goes through the hole in a piece of metal—"

"Look closely, Sam, and push the button."

Sam did so, settling the device in a shaft of sunlight again and squinting through the wires of the cage. He pressed with his thumb. Instantly, the bead on the interior wire vanished from one side of the disk and appeared on the other.

"I still don't see," said Sam in disappointment. Then he stopped. "Hey, wait a minute! How did that bead get through there? There's no hole for it to go through. The wire fills up the hole!"

Mart nodded benignly. "Right. Do you think that might be a sort of flash in the pan gadget that would interest the small fry—and maybe their older brothers and sisters—to the tune of a couple of hundred thousand copies?"

"Yeah, I guess maybe it would sell," Sam muttered as he continued staring into the wire framework,



pressing the button at first one pole and then the other. "But there's gotta be a hole in the disk! There's gotta be a way for the bead to get through," he said. "You gotta tell me!"

### III.

It wasn't expected that the Teleport would have the same magnitude of success as the rocket had enjoyed. They advertised the new toy for a dollar and placed one-inch ads in the mail-order sections of the home owners' and mechanics' magazines as well as the comic books. The results were better than expected.

Mart would have been content with a couple gross well placed sales. And the grapevine told him that these were made very early in the history of the Teleport. They were the ones made to the laboratories already investigating the rocket.

As soon as he was certain that the second toy was being dismantled and investigated by the right people, Mart left all details of its manufacture and sales to Sam Marvenstein and turned his attention to the third project.

He and Berk were prepared to embark upon a career of professional gambling.

As if they had not already done that some time ago—Carolyn Nagle reminded them during their endless dinnertime discussions of the project.

It would be difficult for a single gambling house to add much, percentage-wise, to the glitter of the Las Vegas night, and the Volcano Club didn't try — not very hard anyway. There was a medium-size neon sign atop the building, supposedly reminiscent of the last days of Pompeii, with neon waves of lava washing down the sides of the darkening cone and bits of fire popping out like bright balls from the Volcano's mouth. It was a good sign, but it had to be searched for in the ever-present glow that hung over the city like the nebulous hopes of a gambler about to make his final tilt with the one-armed bandits.

It was a little out of the way, too, being at the end of the block on Bandit Alley in an old building that used to house a drugstore. Not being gamblers by nature, Mart and Berk had not wanted to sink a lot of money into the initial project, but at the end of the first two weeks they were genuinely disappointed.

They stood on the sidewalk outside their nearly empty club, watching the prancing, beckoning lights farther uptown. "It's the location," said Berk gloomily. "I told you we should get a spot closer to the center of things. A new game in an out-of-the-way location is an almost impossible combination. The gamblers are a mob. You don't attract the individual, you attract the group."

"Let's hold out for a few more days," said Mart. "If business doesn't

pick up by then, we'll make some kind of a change. Maybe we should have hired some better looking dames." He glanced inside at the girls taking bets from the scattering of customers. "I don't see how we could have done much better, though. Carolyn is kicking about them now. She claims the proper type of character for the job is a sourdough in a cracked, green eyeshade."

"Let's move out of the doorway. Looks like this might be a customer."

They watched with mild satisfaction as the approaching stranger stopped, glanced a moment at the sign hanging above, then moved inside the club. Their satisfaction vanished as he emerged a moment later. He looked about and seemed to spot them with some difficulty.

"Mr. Nagle—?" he said as he moved toward them.

"Yes," said Mart. It was apparent now that the man had been drinking somewhat and was just barely over the edge of feeling high.

"I want to know how this thing works. I won't use it until you tell me how it works."

"Of course, be glad to," said Mart. He sighed and took the man's arm.

Inside, they moved around to the side of the Volcano where they would not obscure the vision of any customer seated in the amphitheater around the gambling device. The lights of the room were dim, most of the illumination coming through the

plastic Volcano cone. It was as massive as three or four juke boxes and easily topped them in the garishness of its lighting. Waves of light rippled down the sides of the cone, and inside, a dozen brightly colored balls danced madly on a diaphragm across the bottom of the hole that pierced the axis of the cone.

"The world's first and only completely honest gambling device," said Mart. Abruptly one of the balls appeared on the outside of the cone and rolled to the bottom where it clanked against the metal rim. The number of the ball and its color flashed on a panel behind them. One of the customers looked pleased and waved a betting sheet at the nearest girl attendant.

"Absolutely foolproof," Mart said. "The emergence of a ball from the cone is governed absolutely and completely by random chance."

The man peered closer at the balls which had resumed their dancing on the diaphragm. "Is that so? What keeps them bouncing up and down?"

"A small motor actuates the rubber diaphragm. The balls are matched in weight to a thousandth of a milligram and their balance exceeds that of the finest ball bearing."

"Is that so? You're sure the game isn't fixed, now?"

"Positive," said Mart.

"Think I'll try it. Where do I buy some chips?"

"Just take a seat anywhere you

like. One of the girls will provide you with a betting sheet and you stamp your selection for the following game with the device provided on the arm of the chair. The attendant will show you how. The play is continuous."

"Thanks, mister. Two dollar bet high enough to start?"

"You may start as low as a dollar if you like."

"Look, mister, I want my games to be honest, but I want you to know I'm no small timer. Nothing smaller than two dollars for Paul Gentry. But you're sure this game's not fixed—"

Mart went out into the night air and joined Berk. "The guy's a reporter," he said. "We'll be in the papers. If that doesn't bring us business, nothing will."

But it wasn't the newspapers. Not at first anyway. Joe Baird had learned with considerable interest of the closing of the New York office and with exasperation that was also considerable he had tracked them during the ensuing weeks. So elusive had they been that it was two weeks after their opening before his man caught up with them. So it was not in the newspapers at first, but on Joe Baird's television program the following night.

"What two famous ex-Government scientists are now operating a gambling joint in Las Vegas, Nevada, and why? That's the many dollared question that a goodly number of their

colleagues and government officials are going to want answered.

"You recall that we first had the Nagle Rocket which created such a furor during the Christmas season. Next was the idiotic mechanism with the disappearing bead, which is rumored to contain hidden in it even more important scientific discoveries than the rocket toy. Now we have the most fantastic device of all, a new type gambling machine. It is evident that Dr. Nagle's complaint about low Government salaries was a serious one to him, for he now appears in the role of professional gambler to tidy up his personal fortune."

Baird gave a lengthy description of the Volcano cone, obviously based on the observations of the pseudo-drunk to whom Mart had shown the machine. "It is a fascinating gadget, completely hypnotic in its effect on the addicts who play it. We're certain that it will be as successful as the previous enterprises of Nagle and Berkeley, but we express our regret and the regret of a nation that such badly needed genius should be found in the dimly lit back streets of scarcely legal commercialism."

Mart and Berk missed the broadcast, being on duty at the club, but they read the account which was reproduced almost verbatim in the morning paper. Mart grinned as he passed it across the breakfast dishes to Berk. "We'll know tonight. If that doesn't bring them in, nothing will."

His prediction was more than accurate. Long before noon the curious began streaming toward the obscure building housing the Volcano Club. By mid-afternoon there was not an empty seat remaining in the amphitheater.

Even Mart had to admit there was something hypnotic about the thing. He stood at the rear, watching over the heads of the crowd as they leaned half forward in their seats with eyes staring at the wash of colored light and the glowing balls that jumped at random.

Uniformed girls moved constantly along the aisles, accepting bets and stamping sheets of the winners to be paid off at the windows. And then in the later afternoon Mart and Berk recognized some of the visitors who began coming in. A few of them took seats, but others stood at the rear watching with coldly professional faces. They represented the management and ownership of the other, more conventional clubs about the city.

"I think we're in," Mart whispered to Berk. "Within a week we'll have a Volcano in half the clubs in Las Vegas!"

He was a little optimistic there. It took almost three weeks before that number had bought a franchise on the Volcano. He was able to deliver the first one within two days, however, and almost before the delivery truck

was back at the warehouse he received a call. Mart recognized the cigar-in-mouth voice of the gambler with whom he had made his first deal.

"What's the matter with these things? Can't you build them so they will stay operating more than ten minutes? We put the marbles in the hole and all they do is come rolling down the outside. They won't stay in!"

"You put the machine back together the way it was and quit tinkering with it," said Mart. "It will work all right the way we had it."

The gambler adjusted his cigar with a crunching sound in the phone. "We got to change the percentages. You don't expect us to play Santa Claus, do you? How do you make the adjustments?"

"Listen, I told you when we made the deal that these devices are straight. They operate strictly at random. A dozen balls in the pit gives you odds of eleven to one on each bet. What more do you want? The minute you tinker with the machines they'll quit working. Now do you want to buy, or not?"

The gambler guessed he did, and hung up.

"Can you imagine these guys?" said Mart. "They talk about the one-armed bandits—how about the two-armed ones?"

There was a similar problem with every one of the clubs in which a machine was installed, but when it

was finally straightened out, and the gamblers were resigned to operating an honest game, their relationships became one of distant respect based on mutual expediency. Mart and Berk needed the club installations to expose the machines to public view, and the gamblers found it somewhat like discovering a vein of high-grade gold ore under the floor of the roulette room.

Neither Mart nor Berk had any desire to prolong their stay in the gambling paradise. There was still no response, however, from the onsource they hoped to disturb with the machine.

"We've proven the machines are effective as gambling devices," said Berk. "But we're wasting time. We ought to give Sam the go-ahead on the bar and drugstore models. We're not going to get the roulette wheel's successor into the Bureau of Standards and the University of Chicago by sitting here in Las Vegas."

"You don't think physicists are likely to come here to gamble?" said Mart.

"Physicists aren't likely to gamble. And after buying the week's groceries, how could they?"

"Yes," said Mart, "I guess that's one of the points we started out to make. Anyway, I'll bet we get a bite before the end of the week. Whether we do or not, we'll close up by then. I'll send Sam a wire this afternoon to get in production. By next Christmas:

two Volcanoes where only one pinball stood before!"

During the same afternoon Mart's attention was attracted to a patron of the club, who was what Mart had come to label an *ungambler*. There were gamblers and non-gamblers, and sometimes it was hard to tell them apart. But a pure ungambler could be spotted at a glance.

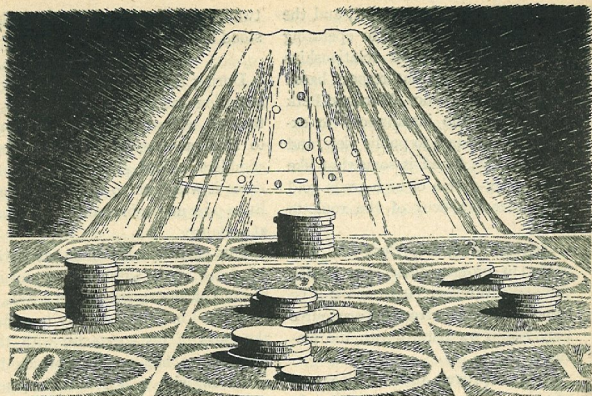
This particular specimen sat in the front row of the amphitheater staring at the Volcano almost as if in a trance. He moved only occasionally to polish the glass of his spectacles with the large white handkerchief, which he withdrew with a flourish. He made bets. A considerable number of them. He did not win a single time. Mart felt like telling him to give it up. You have to have just a *trace*, at least, of ESP or you haven't got a chance. Successful gamblers were loaded with it. The ungamblers were apparently born with a total lack of it.

Mart finally resisted the impulse to protect the fellow from his own deficiencies, and turned away from the amphitheater. He saw that Berk was also watching from a post near the cashier's cage.

"FBI, I'd say," said Berk.

"Him? Not a chance. Probably a fresh MA in English Literature. I hate to see the poor guy throwing away his money, but what can I do?"

It was almost closing time that night before this particular patron



gave up his seat and left the building. They had a house rule requiring betting on at least one game in four in order to keep the seat. Evidently the man had run out of minimum dollar bets. Even so, he seemed reluctant to give up his seat and leave.

Mart half expected him to show up the next day, but he made no appearance. On the second day following, he did show up, however, and Mart almost choked in surprise to see who was accompanying the ungambling stranger.

It was the willowy figure of his old friend, Dr. Jennings.

Jennings' face lighted with pleased surprise as he recognized Mart inside the doorway of the Volcano Club.

"Welcome to our establishment," said Mart, grinning. "I didn't know you went in for connivance with lady luck and the wheel of fortune. It's a pleasure to see you here, anyway."

"Nor I, you," said Jennings wryly. "I didn't see Baird's piece until it was called to my attention several days later. By that time, Roy here was pulling my coat tails and demanding I come and see what you were up to. By the way, have you met Roy yet? He said he spent a day here, but didn't make himself known."

Mart beckoned to Berk, and they turned to the man they had watched lose his money two days before.

"Dr. Roy Goodman, of AEC," said Jennings. "He, too, is not a gambling

man, and he tells me you have formed in him a firm conviction to stay that way the rest of his life."

Mart took Dr. Goodman's hand. "I'm sorry," he said. "I almost asked you to leave the other day. Some people have it and some don't. If you don't, you might as well let the ponies and bingo tables alone.

"And the Volcanoes?" said Goodman.

"And the Volcanoes. They won't do you any good, either."

"I'm not so sure of that," said Goodman. "I was so unsure of it that I went all the way to Los Angeles and brought Dr. Jennings back to help verify my opinion."

"And that opinion is—?" said Mart.

"That the Volcano may be the source of a great deal of good for us. Do you mind if I ask Dr. Jennings to form his own opinion?"

"As you wish, gentlemen," said Mart.

Jennings laughed a bit uncertainly. "Well, let's have a look. I certainly don't know what this is all about. I suppose it's on a level with Nagle Rockets and Teleports. Roy has a mystery, too, and I am completely mystified by you both."

"How about dinner when you're through?" said Berk. "We'll get together and try to unmytify one another."

"That does it," said Mart as he

watched the two men take seats in the amphitheater. "That does it, or I miss my guess. After they get through with their looking we can pack our trunks and go home."

"The AEC, did Jennings say?" Berk asked.

"None other."

Jennings and Goodman stayed inside for a long time. Finally, they came out into the orange sunlight of early evening. Jennings' face seemed pale, as if he had been out of the sunlight for a long time. His hands trembled perceptibly as he lit a thin cigar.

"The food at our hotel is very good," said Mart.

Jennings nodded. Neither he nor his companion said a word. The four men turned and walked all the way to the hotel in silence. Only as they sat down to the table and picked up the menu did Jennings emerge from his remoteness.

"Baked ham," he murmured to the waitress. "And make the coffee strong. Very strong."

Then, while they waited, he folded his hands on the table and settled his eyes on Mart. "I know you too well," he said, "to ask if you are simply pulling our leg, but I have to ask it, anyway."

Mart shook his head. "You'll have to tell me what you mean by that. I have shown you only a contraption for parting dollars from suckers—with apologies and exceptions to present company," he smiled as he glanced

in Dr. Goodman's direction.

The AEC man gave no notice that he'd heard.

"Only two kinds of men could produce the Volcano," said Jennings. "One would be merely a fool who had stumbled on the design by accident and didn't know what he'd made. The other would be a genius who knew exactly what he had—a genius whose brilliance was so great that he could afford to sit back and laugh at the rest of us scratching our heads and looking silly trying to figure it out."

"Nobody's laughing," said Mart soberly. "But you've got to say it."

"All right," said Jennings. "That Volcano of yours is nothing but an extremely exact hyper scale model of a radioactive atomic nucleus, complete with potential barrier penetration in full operation.

"You're telling us that you know the full basic theory behind nuclear structure and phenomena. You're telling us that you know what happens in a radioactive atom. And you're thumbing your nose at us while you say it. Why? Why have you done this to us, Mart?"

Mart looked down at the tablecloth and traced the pattern in the linen with his fingernail. "Not that," he said. "I'm not deriding you. I'm ready to tell you why. I'm ready to tell anyone who figures out the Volcano for himself. After dinner, up in our own room."

The rest of the meal passed in almost complete silence. Berk and Mart knew that Jennings wanted to talk. They knew he was thinking of their last association, on Project Levitation, but he couldn't speak of that with Goodman present.

The AEC man seemed to sense that he was something of an intruder. As the silence continued, a look of disgruntled determination settled upon his face, as if he intended not to be left out of any secrets that might pass between the others.

Afterwards, they went up to Mart's room. Carolyn and the children had gone to a show, so they were alone. Jennings lit a fresh cigar and sat down by a window where he could see the haze of lights and desert dust over Las Vegas. Mart stood a moment near the window, looking out. Then he turned.

"I want a patent on what I've got," he said. "That's all I'm after. Nothing but a patent."

Jennings blew a cloud of smoke into the air and looked up quizzically. Goodman lurched impatiently in his chair. "You have patents!" the AEC man said. "I even wired Washington and had a copy of the Volcano patents sent out while I went to Los Angeles. You're covered on everything you've done!"

But already Jennings was smiling as he watched Mart through the haze of cigar smoke that was fading between them. "So you want a patent!" he murmured. "I should have guessed



that it would be something oblique like that, since you were teamed up with Berk. This is Berk's angle, isn't it?"

"We worked it out together," said Mart. "We had developed these things and didn't know what to do with them. Finally, Berk got so tired of my griping about the impossibility of using them without giving them away that he suggested we do something about it. We have."

Jennings shook his head. "Not yet, Mart. You haven't done anything except stir up a hornet's nest. It remains to be seen whether or not the stirring-up is going to result in any real action on your problem."

"The stirring-up is something in itself," said Mart. "Things will never be quite the same again for anyone who fully understands the symbology of the Volcano."

"You are talking over my head!" said Goodman irritably. "I fail completely to understand what this is all about. You have produced a model which you have tacitly admitted has been correctly interpreted by myself and Dr. Jennings. Now you say you want patents—on a device which is already covered by patents!"

"You will recall," said Mart, "that each patent refers to a specific, unnamed Law of Nature upon which the device in question is based. In accord with the present Patent System that is as far as I can go. And we had plenty of trouble going that far—

getting the Volcano in under the wire as an amusement device instead of an immoral gambling machine."

"What do you mean, that's as far as you can go? Where else do you want to go?"

"Where would you like me to go?"

Goodman became slightly redder in the face. "I would like you to enlighten us in our ignorance regarding the structure and internal processes of the radioactive atom—if you consider us capable of understanding it. I would like you to show how the methods of propulsion in your rocket toy may be adapted to full-scale aircraft. And the Teleport . . . it's obvious what we would like you to do with that, if it's possible."

"It's possible, I assure you," said Mart. "Let me say that I don't know exactly *how*—that would take a corps of engineers some little time and a fairly well equipped development laboratory to design the exact means, but that is only a matter of detail.

"I am not an engineer, Dr. Goodman, nor a gimmick maker—except temporarily. I am a theoretical researcher and desire to remain so. Unfortunately, however, I have to eat. So do my family."

"I don't see what that— Any good University—"

"It is commonly supposed that the theoretical researcher is much like the Artiste of old: far above working for mere dirty money. He's supposed to work for Truth and Knowledge, while

somebody else—the development engineer—makes the old filthy green stuff.”

“Dr. Nagle—”

“Now if I were to do what you ask, to broadcast the basic principles which I have discovered and employed in these devices, I would be completely out in the cold. I would get no protection or further remuneration whatever. As long as I remain a maker of trinkets and gimmicks I am entitled to the full protection and blessings of our Patent Laws. The moment I step into the field of new, basic science I have no protection whatever. I cannot even use my own work!

“I cannot reveal to you these basic Laws of Nature which I have discovered without forfeiting all claim to financial benefit from my work!”

Dr. Goodman made a noise as if appalled by some enormous sacrilege. “Of course you can’t patent a Law of Nature! It’s unthinkable! That’s something that’s just *there*—for everybody to use.”

“Fine. Let them use it then.”

It had grown quite dark but they had not turned on the lights. The only illumination came from the glow over the city. From the darkness by the window they heard a low chuckle and Jennings said, “If we understand your Volcano properly, what you are saying is equivalent to saying that you would like to patent the atom.”

“Yes, you might put it that way,”

Mart agreed reflectively. “I wish to take out a patent on the atom.”

“You’re making fun of us,” said Goodman stiffly. “At the moment it seems to be in particularly poor taste. The Government is most certainly in need of your work. I am sure there would be no question of proper remuneration.”

“You are, huh? A lab and two assistants and seventy-two hundred a year. I made almost a hundred thousand on the Nagle Rocket alone.” Mart turned and paced halfway across the room in a motion of sudden irritation. In the dim light he faced the AEC scientist directly.

“Dr. Goodman, you have been the first to have the honor of understanding the Volcano symbology, but you seem to have great difficulty in understanding what I have said. I *want* you to understand it. I want you to carry it back to the Commission’s laboratories. Whenever my name comes up among your fellow workers I want you to get this straight and report it correctly: Martin Nagle has discovered some of the most important and basic Laws of Nature that we can presently conceive.

“They are of immense importance to Government, industry, and the military, but unless Martin Nagle can obtain a patent on his work and get proper remuneration for it, he is going to do nothing with it except make trinkets, gadgets and gimcracks.

“And you may further tell them

that Martin Nagle has not gone off his rocker. Quote me on it."

He glanced at his watch. "If you don't mind, gentlemen, I'm afraid we'll have to get back to the Club. Since it is our present source of income, Berk and I need to help with the evening crowds."

Goodman was speechless as they left the room, but Jennings winked behind his companion's back and shook Mart's hand. "Keep in touch with me," he said. "I'll let you know the reaction out West. You'll be going back to New York, soon?"

"Yes. We have arranged for a large number of franchises on the Volcano here. It will spread to other gambling centers. Then we are putting out another model to compete with pinball machines in bars and drugstores. All in all, I think it's going to be a very successful device."

"I hope so!" said Jennings fervently. "I certainly hope so!"

#### IV.

Baird had it on his program by the time they got back. Again, they were never quite sure how he managed to get news of their affairs so quickly. It could have been through Goodman this time, they thought, but even that seemed unlikely. At any rate, they heard his report firsthand as the two families had dinner together in Mart's apartment.

"It's out at last," said Baird, pinch-

ing his nostrils together in self-righteousness. "One of the most startling news stories of all time is the truth behind the fantastic enterprises of ex-Government scientists Martin Nagle and Kenneth Berkeley. You will remember these men resigned many months ago from secret Government laboratories to become involved in a toy manufacturing business. Lately, they have managed a gambling house in Las Vega, Nevada. We know now what Martin and Berkeley are after!

"A reliable informant of this reporter has learned that the goal of these two is the breaking down of the entire system of American Patent Law. And the method they choose is apparently that of blackmail!

"Since the beginning of the Patent System, our courts have kept sacred the forces of Nature and prevented them from falling into the hands of selfish, monopolistic interests. The country has prospered technically under the System, and our inventors and scientists have been abundantly rewarded by it.

"Now we have a blatant attempt to destroy it all by demanding control over the natural forces of the universe, which these two men refuse to disclose in the tradition of the great scientists. I do not know what the outcome of this contention will be, but I am certain that our courts will not allow such a brazen assault to succeed. Our Patent System must be protected and retained intact, in

order to secure to inventors their just rights for the fruits of their labors, and at the same time guard against the monopolistic exploitation of the open storehouse of Nature.

"It is a sad thing indeed, to witness the default of two such men of genius as Martin Nagle and Kenneth Berkeley. They *are* men of genius. The whole world of science acknowledges that they are. The genius of the principles in their toys and gambling machines is recognized. We sincerely hope they will reconsider this fantastic effort and return to the laboratories where they are needed so badly in the defense effort of their country."

Carolyn Nagle moved to the television receiver and turned it off. She was a tall, dark-haired woman and her face was unnaturally white as she faced the rest of them.

"That's it," she said. "I hope you are ready for it. If you don't wind this thing up pretty soon, we're liable to be hanging from a lamp-post somewhere along Fifth Avenue."

Mart picked up his glass and stared at the blank screen. "Yeah, I knew it would be bad, but I didn't think anybody would go off their nut to that extent. Berk, maybe you and I ought to go down and have a talk with Baird."

"Uh, uh," said Berk. "As your personal psychiatrist, I advise against it. Baird's a flag-waver. A defender of the home fires. He's just plain dangerous. You'd better stay away from

that guy if you're smart."

"He could be the one to spur an investigation. That's our next step."

"Not if he knew we wanted it. He'd simply hound us over the air until we couldn't move. Carolyn's right. We've got to move fast."

"We've got Jennings," said Mart. "But I'd rather not use him. His association with us in the past is too well-known. I'd rather it came from someone like Baird. Anyway, we can give it a day or two and see what develops. Personally, I think we should wait until more of the right people have seen the Volcano. That's our ace."

"We won't dare let the children out of the house," said Carolyn. "Some crackpot stirred up by Baird is certain to decide to defend his country against them before long. Sometimes I almost wish you hadn't started this thing."

"You can't stand an egg on end without breaking it," said Mart philosophically. "You've got the personal teleport. See the kids are never without it. How quick are you—!" He made a swift motion as if to draw a gun.

Carolyn's hand dropped to the narrow belt at her waist. She vanished before Mart's hand was halfway up.

"Quick enough," she said from the other side of the room.

"Not bad," said Mart. "A little slow in getting your hand on the tab, though. Maybe we ought to practice a little. Anybody want to see Jersey beach tonight—?"

Mart and Berk reopened their offices the next morning. Almost before they had the desks dusted off, there was a visitor. Mart looked up and grinned as Don Wolfe was ushered in.

"I heard Baird on television last night," said the engineer.

"Oh?" said Mart.

"Yes. A darn good thing, too. I was pretty sore the last time I went out of here."

"I don't recall having done anything to offend," said Mart.

"Nothing," said Wolfe, "except give an exhibition of the most colossal, insufferable, unbearable conceit that one human being has ever displayed toward another."

"That's quite an interpretation of my conduct."

"But not an unfair one."

Mart spread his hands and indicated a chair. "And so you have come back."

"Yes," said Don Wolfe, "to congratulate you and to accept your apologies."

"I'm apologizing now?"

"You'd better! I carried it off."

For the space of a half dozen heart beats Mart held his breath. His eyes narrowed on his visitor. "The rocket?"

"Yeah." Wolfe took from his pocket a small object that looked like a cluster of wires wrapped about a half dozen peanut tubes and an assortment of condensers. He bent over and clamped it to the leg of the desk.

"Move back a little."

Mart did so. Abruptly the desk lifted a foot off the floor and remained hanging in midair. He reached out to touch it. It swung gently aside, but when he pressed downward it resisted all his efforts.

"I see." He pinched his lips thoughtfully and leaned back in the chair. "And now, naturally, I'm supposed to ask what you're going to do with it."

Don Wolfe touched the gadget again, and the desk settled gently to the floor. He put the haywire rigging on the desk between them. "I told you I heard Baird last night."

He reached for a heavy glass paper-weight and began methodically battering the contraption until the lights in the tiny tubes vanished amid an unrecognizable clutter of glass shards and twisted wire. He brushed the debris into the wastebasket.

"You don't really need to apologize," he said. "I just wanted to prove I'd done it, and tell you I'm with you."

"But it was close. If I hadn't heard Baird last night, it would have been a different story. I didn't savvy what you were up to until I heard his broadcast. I was too mad to recognize that you were obviously doing something besides exercising pure cussedness.

"I don't think you've got a chance, you understand, but just the same I'm with you. I doubt there's a development or research engineer in the country who wouldn't like to per-

sonally deliver a knockout blow to the Patent Office. If there is, I don't know where he's hiding."

He shifted and arose from his seat. "I'm also going to be out of a job when my chief hears I've just smashed up this pretty little working model. I burned all notes. I don't think the model shop people could reconstruct it from clues I might have left. So if you know of any lab that could use a good development man you might let me know."

"I know of just a small job that needs doing—by a *very* good man. Sit down."

Wolfe resumed his seat and Mart leaned forward. "You heard Baird," said Mart. "So you know what kind he is. I want to use him, but I can't do it directly. He'd balk at anything I even intimidated."

"What I want is a congressional investigation—of me, and of the whole Patent System. I believe that Baird could bring it off. He's just the kind to shake an old bone until everybody is so tired they will agree to anything he says. But he needs to be pushed into it. You're the man to do the pushing."

"What could I do?" said Wolfe.

"Simply tell him your story. You offered me a generous deal on the rocket toy principle, but I refused to turn it over. Tell him the aviation industry has got to have it for vital national defense work. Wave the flag. He'll go for that. Lay it on thick

enough and he'll be braying at congressional doors the same day."

"He might do it too well."

"We'll take that chance. Will you do it? There will be a little pay, but not much."

"Never mind the pay—if this is the crusade I think it is."

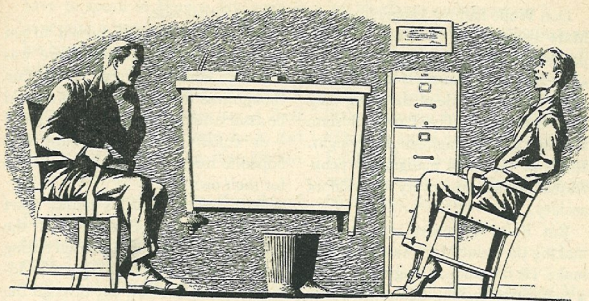
"Thanks. Let me hear from you as soon as you contact Baird."

Mart and Berk expected results from Baird's broadcast. By noon these began to appear in abundance. There were telegrams from Mart's former students, who were now respected engineers and physicists in commercial laboratories throughout the country. His colleagues on a half dozen teaching staffs sent messages also. And strangers whom he had never known, but whose signatures were over the names of some of the largest concerns in the country, added their observations.

Doris, their secretary in the outer office, had long since been given instructions that they were out to all phone callers except their families and important business associates. In Mart's office he and Berk sorted the messages one by one, dividing them into two piles.

"Maybe we need a third pile," said Berk. "Here' a fellow who wants to know if we think we can help him get a patent on his super-cling shoes for cats, which can't be kicked off."

"He doesn't need our help," said Mart. "The Patent Office would grant



that without a second thought! I got one like that, too. Some guy wants to patent a house suspended like a bird cage. Its rocking motion is supposed to cure neuroses of people who were never properly rocked in a cradle. But most of these offer us a pat on the back and wish us luck. How about your batch?"

Berk nodded. "Same here. Some of these guys are really bitter. Not the crackpots. Engineers mostly. The physicists seem a little less enthusiastic about what we're doing. Most of them sound a little bewildered."

"They would," said Mart. "All their lives they have accepted the fact that the Patent System has no bearing on their work, so they aren't even sure of what they ought to expect of it. When the bell finally rings and they catch on to what they've been missing, there'll be a reaction!"

Don Wolfe called on the phone

later in the day. "Baird ate it up," he said. "It was just what he was looking for. It will be on his broadcast tonight. But that guy's a first-class paranoid. It looks to me like it would be a good idea to get a bodyguard until this blows over. He's, quote, out to make a public example of the intellectual selfishness that has hamstrung our nation for the past two decades, unquote. He's just plain nuts."

"That's about normal for the type," said Mart. "I think we can take care of ourselves. If you want me to, I'll fix up some letters now. There shouldn't be any trouble about finding a new job. I hope you'll be available for testimony if this investigation goes through."

"I will, don't worry. And I won't need the letters. I managed to pick up something on my own this afternoon. Let me know when I can help out the good work again."

Don Wolfe had not exaggerated. As Mart listened to the television reporter in the evening he felt a little sick. Baird's viciousness emphasized anew the magnitude of the thing they were combating. The Patent System was only a small fragment, he thought. Roots of the same malignancy penetrated deeply into every division of society.

But Baird succeeded, at least, in making the point Mart wanted him to make. He demanded Congress appoint a committee to investigate the rights of an individual to withhold knowledge of vital concern to the welfare of the nation, even though he couldn't patent his discoveries.

"We know this information exists," he said. "It exists in the mind of one man. Can we afford to let this man monopolize and bury these vital principles beyond the reach of the nation? I submit that this information is comparable to the resources of coal, oil, and atomic energy. We would not think of allowing a single individual to bar access to any of these. I call upon the Congress of the United States to investigate this intolerable situation and pass legislation at once which will correct it."

The effectiveness of Baird's appeal was demonstrated to Mart the following morning as he stepped into a taxi. The moment he was seated, the doors on either side opened, and two neatly dressed men sat down beside him. He felt the points of guns pressed against

him on either side.

Somewhat sadly, he turned to get a look at each of them. There was nothing familiar except a certain thoughtless determination that could be associated with crusaders like Baird—or equally well with thugs who hoped to torture out of him his secrets for their own use.

With the point of his elbow, Mart pressed the control segment of the teleport belt and found himself sitting on the cornice of the apartment building watching the taxi jolt through the traffic below. He watched until it disappeared. He would have to get Carolyn and the children out of town, he thought. He had known the party would be rough, but he hadn't anticipated it quite this bad.

He moved himself down to the apartment and faced Carolyn, who gave a start at his sudden appearance. "I thought you went to the office!" she said.

He told her what had occurred.

"Well, we're not going to move somewhere out in the sticks," she said. "That's the craziest idea you've had yet. If anyone is going to kidnap us, they could do it ten times as easy out there as they could here in town. You would be worrying constantly about how we were. There's no sense in it. We're staying right here until it's over.

"The children are as competent in their use of the belts as you or I. And that reminds me, you are going to



have to speak to Jimmy. His teacher gave him a scolding yesterday about his homework, and he teleported himself right out of class and back home. The teacher became hysterical, and it scared the other children out of their wits. I made him go right back. But you've got to warn him that it's not to be used like that."

Mart grinned at the thought of Jimmy's teacher. But he sobered and admitted to himself that Carolyn was right. It would be foolish to send them away. The incident in the taxi still gave him jitters, however. Something would have to be done to speed things up.

When he finally reached the office, a couple of hours late, it looked as if that something had occurred. Berk handed him a telegram from Jennings.

It said, "Looks like you're going to need help, boy. We're going to give it whether you want it or not. Las Vegas has become the mecca of American physical scientists. The poor guys are losing their shirts. This thing has got to end. Following is a copy of the message we have sent to Washington:

"The undersigned believe it to be to the best interest of the nation that the suggestion be acted upon to investigate the claims and discoveries of one Dr. Martin Nagle, but not for the purpose of suppressing Dr. Nagle, and penalizing him, as has been suggested elsewhere. We ask that such an investigation allow Dr. Nagle to receive an impartial judgment concern-

ing his claims and decisions."

Below the name of Jennings were the names of sixty-five other leading physicists throughout the country.

Mart's hand was shaking just a little when he put the paper down. "Quite a lot of names there of people I didn't think would go along with us. Sort of gives you an idea of who your friends are, anyway."

## V.

With a speed that astonished Mart, this effort produced results. In less than two weeks a formal notification to appear came from a Congressional Committee for Investigation of the Intellectual Resources of the United States.

At Keyes' invitation they stopped in at ONR upon their arrival in Washington. It was a dull, rainy day, and the first that Mart had spent in the city since his last visit to Keyes.

The director's greeting was warmer than his last parting had been, but his face still held a frustrated expression, as if he would like to believe in them, but could not because of a lifetime of believing otherwise.

"They're calling me to testify," he said. "I wish you could tell me more of what you are trying to do. I want to be fair but it goes against the grain of all we've been taught since the beginnings of our scientific careers."

They spent the remainder of the afternoon in Keyes' office. While the

rain dripped steadily outside the window, Mart tried to make the older man understand their divergent point of view. He was not sure whether he had made it or not. Keyes remained noncommittal, but the uncertainty seemed to have been replaced by deep reflection. Mart hoped he would understand, because his testimony would mean a great deal to their case, one way or the other.

The first session of the hearing was scheduled for the following morning. It was called to order in a committee room filled with an impressive gathering which included more than fifty top-drawer scientists and research engineers. Mart recognized many as signers of the Jennings telegram.

Jennings himself was there, evidently having arrived that very morning, since he had not contacted them. Mart recognized other men from the AEC, from the Bureau of Standards, and top universities. There were a number of his former students who filled top scientific posts.

Don Wolfe was there, as was Joe Baird, the TV reporter. And then Mart saw, with a somewhat sinking sensation, the portly figure of his former colleague on Project Levitation, Professor Dykstra from MIT. Mart groaned, and nudged Berk as Dykstra took a seat at the rear of the room. "Nemesis is here," said Mart.

There were five congressmen on the Committee in charge of the hearing. Berk and Mart studied them intently

as they came in and took seats at the long table. There was nothing obviously outstanding about any of them—but neither was there about the group of scientists, Mart thought. He reflected on the situation wherein the decision of these five could affect the lives and work of all these others in the room. What made these five and their colleagues in the Congress competent to judge the limitations to be placed upon the men of science and channel their thinking?

His reflections were interrupted by the gavel banging of Senator Cogswell, who stood at the head of the Committee table and spoke into the cluster of microphones, calling for attention.

Mart watched Cogswell intently. He was the key to the Committee. The senator had come from a Midwestern state, a dealer in farm machinery before coming to the Senate. His face and neck and hands had the perpetual florrid tint of a man who has spent long years of his life in the sun and wind. The press called him Honest Abe Cogswell, and Mart was certain the name fitted.

But you couldn't be honest if you didn't have the data, Mart thought. It wasn't honest to judge a thing concerning which you had no data. And what a fetish you could make of honesty if you didn't even know you lacked the data! Somehow he would have to find the way to give it to Cogswell.

The farmer-politician announced:

"The first to be called for testimony in this hearing will be Dr. Martin Nagle."

Mart stood up and moved slowly to the seat before the microphones. There was a well filled press section, he noted. Evidently all the news services had been stirred into sending representatives on the off chance that something spectacular might develop.

Cogswell faced him across the microphones. "You are Dr. Nagle?"

"Yes."

Briefly, he was sworn in. Then Cogswell resumed. "You have been called before this Committee as a result of certain allegations on the part of yourself and others. It is alleged that you have refused the military and commercial exploitation of certain discoveries made by you, and that these discoveries are of primary importance to the welfare and defense of the country.

"It is alleged that you have criticized the Patent System of the United States in a very serious manner, claiming that it offers you inadequate protection for your work. It is further alleged that you have threatened to withhold knowledge of your important discoveries until revision of the Patent Laws gives you the protection you desire.

"Would you like to state your position, Dr. Nagle, to clarify your points of contention for the Committee, or would you prefer to be cross-examined, first, point by point?"

"I would like to ask," said Mart, "if the Committee is prepared to recommend to the Congress that modifications be made to the Patent System if it can be shown that this is in the best interest of the public, whom the Patent Laws are designed to protect."

"We are not committed to any action," said Cogswell. "But if it can be shown that action is called for, the Committee is prepared to make recommendations accordingly."

"Then I would like to state my case," said Mart.

"Proceed, Dr. Nagle."

"In the beginning of industry and manufacture," said Mart, "the basis of success was often what came to be known as Trade Secrets. A man or a family, over a period of years discovered superior techniques for producing some item of trade. The process would be zealously guarded from disclosure to any possible competitor. Only by preserving the secrecy of these processes could the inventors and discoverers of them obtain any just remuneration for their work of discovery.

"Until very recently, historically speaking, this system of Trade Secrets prevailed. Obviously, it has drawbacks. It impedes the flow of knowledge. It prevents the progress which might result from the application of one man's knowledge to another's discovery. Because of these draw-

backs, the Patent System was born. In theory, this is designed to release the vast store of Trade Secrets and put them in the reservoir of common knowledge to be used by all men. In return for contributing his discoveries to the common store, a man is theoretically rewarded by the Patent System by being given a limited monopoly in the exploitation of the discovery.

"In addition to providing a reward, the Patent System is supposed also to provide an incentive for new discovery and invention. Actually, the present laws achieve almost none of these very idealistic objectives. The System has failed to keep pace with the technological and scientific progress of the world so that it fails to accomplish that for which it was designed. It protects virtually none of those who most deserve its protection.

"I, for one, am in the position of having what we may term a Trade Secret of great value both to myself and to Society. I would like to share it, but under the present Patent System there is no possible way I may do this and receive a remuneration which I consider adequate and equitable."

A senator interrupted, frowning. "You mean you are not able to obtain patents on your discoveries under the present laws?"

"That is correct," said Mart. "I cannot protect my discoveries, therefore, if I am to make any practical use of them I must keep them as

Trade Secrets, as it were."

"But there are patents here," said the senator. He held up a sheaf of papers. "I have copies of patents issued to you, covering the devices over which disputes seem to have arisen."

Mart shook his head. "No, sir. There is no dispute over the devices covered by those patents. No one is trying to deny me the privilege of making a million toy rockets propelled by antigravity, nor do they care if I become rich as an operator of gambling clubs.

"But I do not wish for these things. I have been forced into these activities by the deficiencies of the Patent Laws."

The senator gulped a mouthful of air in restrained exasperation. "How in the world can any law of the United States force you into such activities against your will?"

"Just a moment, if you will," said Senator Cogswell. "Perhaps we should allow Dr. Nagle to complete his testimony without interruption. There will be opportunity for questioning later."

"If I were free to do so," said Mart, "I would immediately release my material to the industrial and Governmental laboratories of the country. Within months, the hundreds of engineers in these organizations would be able to develop scores of useful devices based upon my discoveries. But the engineers would be granted patents

on the devices in the name of the corporations for which they worked. The corporations would be the ones to profit. I would get not one dime for my part of the work!"

"That's fantastic," the interrupting senator said. "I can't believe that such a situation exists. Certainly no one is going to try to force you to give your work away for nothing.

"What I do not understand is all this talk about inadequate protection under our Patent Laws. Exactly what is it you wish to patent? Why cannot these so-called Trade Secrets of yours be handled in a normal patentable manner?"

Mart smiled and shrugged. "You cannot require me to explain my Trade Secrets here. In this audience there are those who would take unauthorized advantage of them if I were to describe them at this time. Briefly, the work that I have done is classified by the patent authorities as Laws of Nature. These cannot be protected."

Cogswell frowned. "I am not too familiar with the terminology," he said. "I presume that an example would be the Law of Gravity."

"Yes," said Mart. "The Law of Gravity would be classified by the patent people as a Law of Nature."

"And you suggest then, that if Sir Isaac Newton were alive today and published his discovery of the Law of Gravity that he should be allowed a patent on it?"

"Precisely," said Mart. "That is

exactly the thing I am suggesting."

There was a general shifting among the audience, the scrape of feet on the floor. From the Committee table there were unrestrained snickers.

Chairman Cogswell did not restrain his own smile. "I fail to see, first of all," he said, "what good it would have done the good Sir Isaac to have held such a patent. The Law of Gravity would continue to operate, I am sure, regardless of the patent. Are you suggesting that it would have had any effect on our lives to have the Law of Gravity patented?"

"Perhaps Sir Isaac could have levied a toll upon each of us for the privilege of sticking to the surface of the Earth through the operation of his law? Or collected a royalty on each apple that falls?"

The senators chuckled in unison, turning to one another in appreciation of Cogswell's fine wit. But Mart was looking over the faces of the technical members of the audience. He was pleased with their frowns of disgust.

"I do not make any such suggestions," Mart said to Cogswell.

"Then will you please explain to the Committee what earthly value it would have been for Sir Isaac Newton to hold a patent on the Law of Gravity! And what good it would do you to be issued patents on what must be equally obvious Laws of Nature."

"In your last statement lies the fallacy which is at the root of all our

difficulty in understanding one another," said Mart. "The *action* of gravity is obvious. The Law of Gravity is very far from obvious. The Laws which I have discovered are even less so. As a matter of fact, they are so unobvious that I will make the statement that, unless I agree to reveal them after being given proper patent protection, they will not be rediscovered for at least another hundred years."

"You take a high view of your own abilities in comparison with those of your colleagues!" said Cogswell dryly.

"No—not of my abilities, but of the methods by which I have been able to make these discoveries. To clarify my position, let us take a more understandable example.

"One of the most well-known technological devices in modern science and industry is the common photoelectric cell. The photo cell was made possible by the discoveries of Dr. Albert Einstein. Dr. Einstein did not *invent* the photo cell; he discovered the basic principles by which others were able to do the actual designing of the device. Do you see the difference?

"Dr. Einstein did not, and could not obtain any patents upon his basic discoveries. He went without any appreciable remuneration for that work. But the corporations which have since designed and manufactured photoelectric cells have been paid fabulous royalties on the patents they hold on photo cells. The man who made photo

cells possible receives no royalty.

"This same man, through his momentous principle:  $E=MC^2$ , laid the foundation for the atomic bomb. You may be sure that the Atomic Energy Commission does not pay him royalties on each bomb produced—or to any of the other workers whose basic discoveries made possible the production of this weapon.

"On the other hand you will find that—"

There was a sudden explosive stir at the rear of the room. For a moment it seemed as if an excited beetle had burst into flight. Then it became apparent that it was merely Dr. Dykstra who had flown from his seat and was rushing down the short aisle toward the senators' table.

"This is preposterous!" he exclaimed. "Absolutely preposterous! I assure you, gentlemen, that Dr. Einstein would not have his name profaned by being mentioned in connection with this . . . this mercenary attempt to—"

Chairman Cogswell rapped loudly with his gavel. "If you please! You will be called and allowed to give testimony when the time comes. At the moment we are hearing Dr. Nagle. You will please take your seat and refrain from further interruptions of this kind."

"I have only one more major point I wish to make at this time," said Mart. "Mention has been made of

the nation's need of scientific talent of the highest order, the need of new and basic discoveries. I wish to add my observation that this is indeed true. Our need is critical.

"But basic scientific work is not being done in adequate quantity because the material rewards to the individual researcher and his sponsoring agency are not great enough.

"I have shown what happens in the case of a man like Dr. Einstein. But consider the corporation that employs large numbers of men for the specific purpose of inventing and discovering new principles. Consider Gigantic Electric Corporation. It assumes a burden of five million dollars worth of basic, theoretical research per year. The results happen to be some basic laws of chemistry and fluid flow. Due to the patent situation these laws cannot be protected but they are highly welcome at Mammoth Chemical and Altitude Aircraft, whose engineers get large numbers of patents on the devices they develop out of the principles discovered at Gigantic.

"Next year, Gigantic's research produces a semipermeable membrane theory. Mammoth Chemical thanks them kindly, does some development work, and obtains patents on methods of extracting fresh water from the sea at a dollar per cubic mile or so. The AEC improves the filters at Oak Ridge. Somebody else gets patents on separating useful hydrocarbons from petroleum by-products for plastic

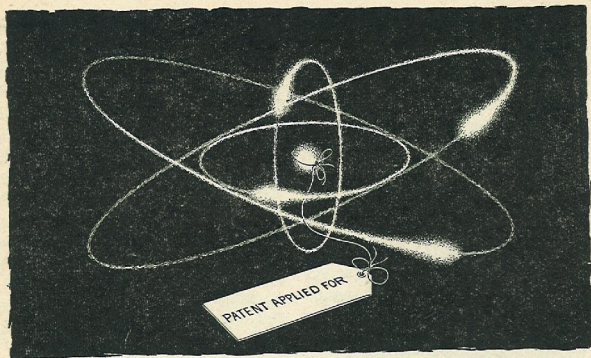
manufacture.

"Gigantic Electric gets nothing. Their stockholders howl. Gigantic drops the big theoretical research program. Nobody dares take it up because, under our present Patent System, there's no return in money from theoretical research on an adequate scale to supply the needs of the nation.

"There's your problem, gentlemen, it's not the question of Dr. Martin Nagle being a dog in the manger with respect to the few things he has available. It's a major problem that affects every sincere, responsible scientist of top-drawer caliber in the nation. It affects the scientific welfare of the whole country. I call upon you to give us the solution we need!"

There was a small dinner party that night at the hotel with a couple dozen of his closest friends. Keyes was there and Jennings, and Don Wolfe. They invited Dykstra just for the hell of it, but the professor had urgent business elsewhere.

Mart kept the talk away from the hearing, and from the general subject of his discoveries. It kept spilling over into their conversation, but he had no intention of letting it be aired at the dinner table. All they had to say now was for the Committee. Only Jennings broke through with one piece of information pertinent to Mart's work. He reported that Goodman had acquired one of the tavern-size Vol-



canoes and was working out a system to beat the game.

Testimony was resumed on Tuesday morning. Dykstra was the first to be called. He arose with a clearing of his throat and moved portentously to the front of the room with the faint side-wise waddle that marked his movements.

He said: "From that great moment, now lost in the dim shades of history, when the first cave man struck fire from flint to warm and illumine his cavern, there has been a code which the true scientist unwaveringly observes. Unspoken and unwritten, it is nevertheless engraved upon his heart in letters that burn. That code is that knowledge shall be free. It shall be the rightful possession of all mankind. The true scientist would no more think

of taking out a patent upon his work than he would think of deliberately falsifying the reports of his observations. Nowhere, in the presence of scientific men, have I heard anything quite so insulting as the reference made yesterday to the revered name of Dr. Einstein. As if he would actually be concerned with the trivialities of royalties from the manufacture of photoelectric cells! Royalties are for tinkers and garage mechanics. Scientists have nothing to do with such!"

Cogswell coughed behind his hand. "It would seem, Dr. Dykstra, that scientists must also eat."

"The laborer is worthy of his hire," said Dykstra. "No genuine scientist ever starved or was in want. He must live sparingly, of course, but a Spartan regimen is all the more conducive to



the work of the mind at highest efficiency.

"No, indeed, senator, the true scientist is not in need of royalties. A man who is worth his salt will automatically gain the reputation that will take him where he deserves to go—to the laboratories and to the endowments which are his rightfully, in return for the benefit he bestows so freely upon all mankind. Bestows without thought of the vulgar commercialism which we see here being attempted to be thrust upon us."

In the afternoon, Jennings was called. His spare, sticklike frame settled awkwardly into the witness chair. An amused tolerance was upon his face.

"I would prefer to answer your questions," he said. "There is no general statement I have to make beyond what has already been said."

Cogswell said, "What can you tell us, Dr. Jennings, of the allegedly revolutionary principles behind these toys of Dr. Nagle?"

"I can tell you nothing, because I do not know what these principles are," said Jennings.

"You do not know for certain that Dr. Nagle has actually made the discoveries claimed for him and by him?"

"I am certain. I am very certain that they exist. I am certain that this Volcano which you have there on the table is symbolical of perhaps the most revolutionary discoveries since those

that led to the release of atomic energy. Proper utilization of the principles symbolized there would no doubt lead to transmutation of the elements with the simplicity of ordinary chemical reactions. It is difficult to estimate the value of the discovery."

"And yet you tell us you do not know what the principle is," said Cogswell. "It appears that the scientific mind runs in channels far removed from the reasoning of ordinary individuals."

"No, that's a very ordinary channel of thinking—or should be, anyway," said Jennings. "It simply means that I know the abilities of Martin Nagle. I know him. I trust him. If he says it is so, then I believe that his symbology is based upon actual fact."

"Well, if you are so convinced of the existence of these discoveries, what is your opinion of Dr. Nagle's contention that he is entitled to patent protection upon them?"

"I think he is entirely correct in his demands," said Jennings.

"And these unknown principles would be classified, patent-wise, as Laws of Nature?"

"Yes."

"If this is the case, why have they not been exposed by others of your profession? Is this symbology not sufficiently understandable to be deciphered? Do you acknowledge that, as Dr. Nagle says, no one else is smart enough to figure these things out for

another hundred years? Or do you have another unwritten code—one forbidding you to try?"

Jennings smiled wryly. "Dr. Nagle didn't say that, but we'll let it pass. We have no code, either. On the contrary, there is scarcely a scientist in the country who has not tried to crack these three gimmicks of Mart's since he put them on the market. I know of only one man who has made any partial success of the attempt."

"Can you give any reason for this lack of success? Is Dr. Nagle truly the singular genius he appears?"

"He's a singular genius, all right, but not in the way he appears," said Jennings with a laugh. "To answer your question, I suspect there are certain traditional ways of finding out things that are wholly wrong in their approach. I believe Dr. Nagle has abandoned these and has devised for himself new methods to find basic knowledge."

"And you would say, I suppose, that this Committee should recommend amendments to the Patent Laws permitting Dr. Nagle to obtain patents on Laws of Nature?"

"Indeed I would!" said Jennings.

## VI.

They came in a stream after that. There were the bitter ones and the bewildered ones, and the senators listened in astonishment as the young researchers talked of the idiocy of

legal definitions in scientific matters. Of invention and noninvention. Of combinations, defined by the legal mind. Of novelty and prior art. And the wonderful slip-of-the-wrist definitions of statutory and nonstatutory items. Of the mysterious "flash of genius" so essential to invention.

Some of the younger, less disciplined men poured out the unrestrained bitterness of long hours of research and development judged fruitless from the standpoint of patentability and resultant compensation.

But it wasn't getting out, Mart observed. The reporters were taking down the words, but the bitterness wasn't getting out to the minds of those who could vindicate him against the accusations that Baird and his kind had made. It was far easier for the press to quote a Dykstra and his comical, melodramatic interpretation than the sincere frustration of the researchers who were doing all they could to back Mart.

Thursday noon he said to Berk. "We've got to get it out where every one can buy it. Even if we win here in this little Committee and finally in Congress, we won't have touched the problem of minds like Baird's. That's the real enemy."

"What are you going to do?" said Berk.

"I'm going to offer to be interviewed on his program."

Berk whistled. "Brother, that's the equivalent of putting your head into

the lion's mouth clear down to your ankles. You know how they can murder you on those so-called interviews. You're up there like a mounted insect with a pin stuck right through your middle. You don't say a word. If you do, they shout you down with accusations of every sort. Baird'll take the hide off you!"

"I don't think so," said Mart. "It's pretty tough to tear off."

Baird was more than delighted with the suggestion. Mart had the impression that the commentator could scarcely refrain from baring his teeth. Momentarily, he almost wished he had accepted Berk's warning.

"I would like it to take place as soon as possible," he said. "Before the completion of the hearings."

"Tonight," said Baird. "I'll scrap my whole program for this evening and give you a chance to state your case to the whole country."

Mart nodded. "I'll meet you at the studio."

He didn't require any preparation. He knew exactly what he wanted to say. It was only a matter of keeping Baird from mangling his whole story. It was obvious that he was going to try.

He sat Mart at a bad angle, to begin with, so that his face was away from the cameras, and only Baird could make direct appeal to those who watched and listened. As soon as they were on the air, Mart shifted

his chair so that he faced the camera squarely. Disconcerted, Baird was forced to shift or appear to be sitting behind Mart. He shifted.

He opened with a stream of talk that gave the audience a none too subtle view of the difficulties that television commentators endure in the course of their public service work. The impression was left that Dr. Martin Nagle was among the most difficult crosses that any commentator had to bear.

He said, "Dr. Nagle, will you tell our audience just what your concept of a satisfactory patent system is?"

"A patent system," said Mart, "is intended to be a form of remuneration to a discoverer in return for the use of his work. In the case of—"

"Well, now, just a moment, Dr. Nagle. The reward offered by a patent is in the nature of a monopoly, and that is the crux of our present problem. You cannot say that it would be justifiable to grant a person a monopoly on just any kind of a discovery because he happened to be the first to discover it."

"I did not use the word monopoly," said Mart. "I said remuneration. In the case of—"

"Well, now, Dr. Nagle. You say remuneration. All right, we'll use the word remuneration. But it is obvious at once that if you wish to place the magnitude of the remuneration in direct proportion to the magnitude of the discovery, there rapidly appears a

point at which it is ridiculous to allow a single individual to control or realize the rewards of certain discoveries which will be of the utmost magnitude. Do you not agree that this is so, Dr. Nagle?"

Mart shrugged and smiled and said nothing. He glanced at the watch on his wrist, hoping he had not miscalculated the time at his disposal.

Baird hesitated, waiting for Mart to make a statement which could be interrupted and shouted down. But Mart remained silent.

"Will you tell our audience, then, exactly how you view your own present, controversial discoveries in the light of our present Patent System?"

"I will," said Mart quietly, "if you will allow me to finish my statements without interrupting before I am through. If I am interrupted again, I will allow the audience to make its own decision as to why I am not permitted to state my case."

Baird grew red in the face, and it looked as if he were going to explode. Just in time, he glanced at the ever-present cameras.

Mart let his breath out slowly. He had been right. The cameras were the one check that would keep Baird in line. The commentator's bottled up rage would scarcely permit him to interrupt now.

Through thin lips and blazing eyes directed toward Mart, and momentarily out of range of the camera, he

said. "Please continue—Dr. Nagle."

Mart looked directly into the glistening, opaque eyes that were like some stupid inquisitors out of space. "We have built our nation," he said slowly, "on the principle, among others, of just rewards for conscientious labor. The correctness of this principle can be determined quite easily by comparison of our society with those based on other principles which require that both the man and his labor belong to the community.

"In the beginning, it was easy to make our labor principles work. A man staked out a farm and produced his crops and traded with his neighbors. Afterwards, there came to be so many kinds of labor that it was difficult to evaluate one in terms of another, with a just remuneration for all.

"Among the most difficult was the labor of a man who devised machines to lighten the burden of his neighbor and himself. How much should he be paid for such devising? Once he built and sold such a machine he had no reward for the days spent in thought and creation. When the secrets of the machine were revealed, any man could make it for his own.

"The man who invented did so because he loved that kind of labor, just as the farmer loves the earth. But even inventors must eat and provide for their families. How could the farmers as a group properly repay the inventor for his creation? In its attempt to provide justly for these men,

society has made laws that grant limited monopolies to the inventor for the exploitation of his discovery. This is intended to be his reward and remuneration.

"In the exploitation of the resources of the land, we followed the same plan. A man was allowed the land which he staked out and put to use. He was allowed to mine and sell the minerals and oil found within it, for his own profit.

"Nowhere have we ever challenged the right to exploit and make a profit from that which a man discovers—except in one field. The intangible field of Man's exploration of the principles and laws upon which the world of nature operates. A housewife can make a small fortune by devising a simplified method for cleaning out the family plumbing. The man who discovers the forces that hold together the building blocks of the Universe gets nothing.

"It has been said that the thrill of discovery is all the reward that such a man needs or wants. That is a fool's answer. We live in a real world that demands that we be fed and clothed and housed adequately and that our families are well cared for, if we are to embark on the longest voyages which the mind of man can make.

"We have made it possible for housewives and garage mechanics to reap fortunes for a few weeks' work in basement or shop. But we have not made it possible to reward the man

who discovers a basic secret of the Universe.

"I have given myself for an example. I made a toy, a trivial gadget of little worth. For this, you paid me a substantial sum. But I also discovered what force it is that reaches out across the depths of space from planet to planet and from sun to sun. And it is demanded—literally demanded by Mr. Baird and others—that I give this for nothing!

"I have done this to show you what happens to scientists who try honestly to devote their talents to the good of all. What I cannot show is the amount of waste of intellectual ability that results from the failure of our Patent System to reward those who discover new Laws of Nature. Our great corporations would like to promote vast programs of research into the secrets of the Universe. But there is no way for you, the workers and stockholders in these companies, to profit directly from such research. There is no way for an individual to engage in a career of pure, basic research with the hope of profiting thereby, unless he turns maker of gimmicks, as I have done.

"But I do not wish to be a gadgeteer. Neither do thousands of others who are forced to do so because they can get a reward in no other way. Further than this, it is fundamentally impossible for us to make such a switch of profession and do it adequately. There are theoretical re-

search minds, and there are engineer-type-thinkers. By their very nature, these are not interchangeable in the kinds of work that each is competent to perform. Each needs the other. If both are forced into one mold, then both suffer alike, as a result."

Out of the corner of his eye, Mart saw it coming. It was almost as if Baird had drawn back his arm and were aiming a polished haft and gleaming point in his direction.

The television reporter leaned forward, his eyes shining with malice. He had timed it just right, Mart thought. For a moment he felt a little sorry for Baird. You always knew what a mind like Baird's was going to do next. The rut it traveled in was old and very deep.

When he spoke now, Baird's voice was low and modulated with his special kind of phony sincerity. "Suppose that the present hearings before the Congressional Committee were decided against you, Dr. Nagle. Suppose it is decided not to reward you with a monopoly on what has long been considered a Law of Nature so that you can profit therefrom. This is a time when your country needs these discoveries very badly, so the scientists tell us. Your country, which is perhaps the only one under the blue sky of Earth where you could have the freedom sufficient to make these discoveries. Will you give them to that country of yours freely, even

if the decision is against you? Or will you bury them as you have threatened to do—until someone else who can equal your great genius comes along and rediscovers them? Which will you do, Dr. Nagle?"

Baird drew back, grinning triumphantly. Mart paused long enough to let him enjoy that triumph. Then he faced the cameras squarely again.

"I will give my work freely, of course," he said. "What I have done has been merely to bring this tragic injustice to the attention of the nation, which is being harmed so irrevocably by it. I have done this because I believe in my fellow citizens. I believe they will no longer permit this injustice to continue—driving out of my profession those whose life work ought to be the uncovering of the great secrets of Nature.

"Rather, now that they know the truth, they will insist that justice be done. First, because it is their nature to be just. Second, to draw back to my profession the thousands of brilliant young minds that should not be forced into the making of gadgets for a living. I assure you, Mr. Baird, and you, my fellow citizens, that my discoveries will not remain very much longer as Trade Secrets."

Afterwards, Mart contended that it was the television broadcast that swung the decision, but Berk was not sure. The following days saw a huge

stack of testimony taken from scientists who told almost incredible stories of trying to get satisfaction from the existing Patent System.

Mart was called for final testimony and rebuttal, but he could only underline what had already been said. He was gratified, however, to observe that the attitude of the whole Committee was considerably different from that expressed by them on the first day of the hearings. He even felt that perhaps they understood—just a little—what he meant by declaring that Sir Isaac Newton should have been able to patent the Law of Gravity. And that he, Martin Nagle, should be allowed to patent the atom.

At the end of the final session, Senator Cogswell took his hand. "There'll be some changes made," he promised. "It may be rough going to get it done. We may have to call you back again—more than once. But in the end you people are going to get what you want. Generations of scientists to come are going to be grateful because you endured the personal sacrifice of staging this demonstration which brought to our attention the inadequacies of a system of which we were unjustly proud."

It was not until they were back in New York clearing out their temporary offices for a move to a more reasonable environment that they saw Don Wolfe at any length. He came in the morning after their return and sat

down without a word in a chair opposite the desk where Mart was examining a file of papers. Berk was packing a carton of reports on the other side of the room.

"I want in," said Don Wolfe finally. "It was all over before the full crux of this thing hit me like a sandbag on the noggin. You shoved it through so fast that you almost put it over on me, too."

"Come again?" said Mart.

"You put on a show and bribed them with antigravity and teleportation to change the whole Patent System, and not one of them guessed what you were really doing—what they were actually letting themselves in for."

Mart glanced across the room toward Berk, his eyebrows slanted in a frown. "So? Now we have secret designs and untold motives?"

Wolfe nodded. "If you had lived in ancient Salem, they would no doubt have burned you for witchcraft. They were more clever at catching on to these things back in them days. But I'm not entirely sure it won't happen yet. You have just delivered one of the deadliest rabbit punches ever given to the glorious age of scientific superstition, and I don't think its high priests are going to let you go entirely unscratched.

"Dykstra is not the only one. He just happened to be in the minority at the Committee meetings. The others would have come if they had

known you had a chance of winning. The universities are bulging with them. There are plenty, too, in the commercial labs. The AEC and the Bureau of Standards are salted liberally with them."

Mart laughed and gave up the work he was trying to do. He leaned back and looked at Don Wolfe. "I'm afraid I haven't the least idea what you are talking about, Don."

"The old way was a good way because it was essentially designed to discourage new thinking. It encouraged a man to try to make a million by selling a new and patented writing tool that wouldn't work. It encouraged file clerks to invent collar holders and tie clips. It got ten million tinkers and garage mechanics to spend their week-ends thinking up dimestore ding-whizzits and mail order thingoo-lies so they could get enough to retire.

"And it kept nicely under its thumb the thousands of good brains that might have been engaged in new,

basic thinking on how the Universe is put together—which is what its chief purpose came to be. Oh, not consciously, of course! You know that better than I. The human organism is far more devious than that. But that's been the effect.

"Now it's blown wide open. You meant to blow it open. You did it deliberately, knowing the full effect of what you were doing. And I almost missed it!

"I want a piece of it. I recognize that, compared to you guys, I'm a sort of subhuman moron, but I'm bright enough to see what's going on. I can sweep floors and brush off desks and take care of laboratory equipment. So—have you got a place for me?"

Mart laughed again and turned to his partner who was chuckling softly. "I guess the firm of Nagle and Berkeley can always scare up room," said Mart, "for a young man who exhibits such terrific powers of imagination!"

THE END

## MEIHEM IN CE ACCOUNTS

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THE EDITOR.





# THE HAPPINESS EFFECT

BY RAYMOND E. BANKS

*Do you want to be made happy? Do you wish a technique existed by which your unhappiness could be magically removed? What would it mean if someone could do it for you: Answer: They would, brother — they would!*

Illustrated by Frank Kelly Freas

I was standing in the town's main drugstore when I felt a tug at my sleeve. Most of my troubles as the town's police chief begin with a tug at my sleeve. It was Dr. Roydan, as usual, peering up at me with his close-set eyes.

"Fellow just come into town," he said. "Suspicious. Painting pictures out at Willow Hollow. Maybe you should speak to him."

Doc Roydan ran his tongue over his thin lips and the old face wrinkled into a grin which isn't a real grin but a

grimace, a tic that he has.

"Has the Town Council passed a law against painting pictures of Wil- low Hollow?" I asked, not able to keep out a little sarcasm.

"Now, Henry," he protested, "you know as the duly appointed Brain- writer I got to keep my eyes on things. If it wasn't for us Brainwriters—"

He went into his lecture on brain- writing. I can stand a man being proud of his profession, but he ought to figure out different ways to say it instead of always the same. I cut him short with:

"Yeah, I know. You've wrote on my brain. You've wrote on almost all the brains in this town. The women of this town bore all the children, but you're sure enough the father the way you wrote on all of our brains."

"That's a fact!" he said, his eyes glinting in pleasure instead of seeing it how I meant it. "There aren't a dozen folk in Benton who haven't been improved by my scalpel—im- proved, I said," he said, giving me a sharp look. "Why, I remember when you was a young fellow—"

I started to go out then because the people in the drugstore were beginning to laugh. Old Doc Roydan can really get embarrassing when he starts to reminisce.

Doc Roydan has what I call an acid memory. He takes a little truth and mixes a lot of ugly conjecture with it. And he's peered intimately into so many of our brains here in Benton

that he gets individuals mixed up a lot of the time. But we really ought to appreciate him more, because there isn't a finer brainwriter in the state. I understand that before the Social Adjustment Act of 2150 the town of Benton used to have a staff of six policemen besides the chief. Since brainwriting there's only me and my staff of one—young Briggs who works most of the time at the brickyard. Dr. Roydan's brought a lot of happi- ness to this town, like the Brainwriters did everywhere, and life seems a lot finer for the work those fellows have done.

But there I am adjusting again, and that's because of Doc Roydan's stylus and whenever I remember that I'm building everything up all creamy just because of the old boy's stylus, I sort of rebel.

Just sort of.

I stopped in the real estate office to see the mayor. Perry grinned at me and spoke before I could open my mouth:

"We've been honored with the presence of an artist. His name is Arnold Vivian; he's staying at Mrs. Barton's Room and Board, and he doesn't do anything all day long but paint."

"No wife?" I frowned.

"No wife, no children, no nothing. He just paints."

"Listen," I said, "as long as he just paints, that's legal."

"True, Henry. But did you ever

know an artist chap that just painted?"

"How old is he?"

"Old enough," said Perry, losing his smile. "Old enough so that Doc Roydan was passing out the word to all the unattached females in town—on the sly, of course. Nothing crude. And to the Used Aircar Agency and to the brickyard and every place where they need an extra man. Arnold Vivian had better keep on just painting—there's an awful lot of people in this town that could use a free, single man."

I grunted and passed on. Since brainwriting we're happier, but there're fewer of us. Of course, a small town like Benton really got it in the neck during the long manpower shortage. It would be interesting to know what the connection was between brainwriting and fewer children but that's academic now— They've learned a lot since the earlier days and now the birthrate is going up.

When I dropped my aircar down in Willow Hollow, Arnold Vivian was there, a sure-enough artist with a sure-enough easel set up and painting away. He was a young fellow in his mid-twenties with thinning hair and eager, flashing eyes.

He paused while Lucille Wentworth with her berry bucket passed in front of the scene he was painting, picking the wild berries. It didn't strike me as odd that a town girl would be picking

berries out here because lots of young folks do it to pick up extra money. But you don't go picking berries in a playsuit like she was wearing. You'd get too many scratches. Both of us watched the near-naked figure for a second and I don't know what was on his mind, but I—

"You've got a picturesque town here, Marshal," said Arnold Vivian, grinning at me.

I didn't grin back. It doesn't pay to get friendly with people you may have to run in later. "Don't call me Marshal," I said. "I'm Henry Horner, just plain police. And if that gal over there doesn't move on—"

"She does interrupt the scenery," he said, and his eyes got an excited look.

"This town is Benton," I said, "and we need new young men. If you get into any trouble in this town, we've got a real fast brainwriter who'll straighten you out. But chances are you won't ever leave here, if that happens."

His smile got cold. "I don't get into trouble, Mr. Horner," he said. "Put a paint brush in my hand and I'm adjusted. I've been to Europe, the Orient and every state in the Union and I haven't seen a brainwriter yet that could make me happier or more adjusted."

"Don't forget," I said, "we need workers these days. Who needs pictures on canvas?"

He dabbled in some color with his

brush. His lips tightened. I could tell right away that he hadn't been selling any pictures.

"Who needs pictures on canvas?" he repeated. "Why . . . me. Maybe some day a few others will agree with me."

Somehow I liked that answer. "Got any money?" I asked.

He stood up and looked me in the eye. He was a wiry lad, healthy and proud-looking. "Mr. Police," he said, "there's food in my stomach, clothes on my back and supplies in my knapsack—I got it all honestly. That's where your interest in me ends. Why don't you go back to town and write your hovering tickets for overparked aircars?"

"Just asking," I said. Somehow I felt sorry for him and tried to be friendly. "I used to be sort of . . . artistic . . . myself. Baritone concert style."

He was back to painting now. "I'll bet you're good on a police whistle, too," he said icily, and I left him, figuring if he was too dumb to take a hint, I couldn't help that.

I went over and tagged Luce Wentworth.

"Go home and put on some clothes," I said. "That fellow over there is an artist in love with art, not women. He ain't got time. In other words, dress it up, Luce!"

She openly sneered at me, twisting her fine, young body so that the sun glistened from her revealed, bare

skin. If young Vivian was as normal as I feared, he was going to have a hard time around Benton.

"Since when does Big Thumbs become a fashion expert?" Lucille asked me. "I've got enough on—leave me alone."

And she stalked off, flirting her hips so that I could feel my own skin tingle. There was nothing I could blow a whistle on yet, but in my bones I knew the stage was set for trouble and I felt low as I zoomed back to town.

I had to meet Bessie, my wife, for lunch with the kids. The kids tumbled in the back and Bessie got in and said:

"I hear there's an artist in town. A free, single, eligible man."

"Yeah."

"What's that tune you're hummin'?" asked Bessie.

I stopped suddenly. "'Roamin' Free As The Breeze,'" I said.

We looked at each other. Way it was, I was going to be a big-time singer one time back, but Bessie and I had the love fever. She said that if Doc Roydan did his brainwriting on me and I still wanted to sing, she'd go along with the gag. But after the job was done I got married and settled down instead. That's always been one of those nasty things between us. She just sat there, wooden, because singing didn't mean much to her, nor painting, nor any of that stuff, and it wasn't her fault. I didn't say anything either. I was thinking of Chicago and Europe

and all those faraway places that Arnold Vivian had been, but pretty soon Doc Roydan's brainwriting creamed it up for me and I muttered "Got to get the world's work done," and we relaxed and went on in and had lunch.

Benton has a Saturday night dance. That's an apology, because you'd think that no self-respecting small town would have a Saturday night dance in these modern times. I never go near it myself because since the brainwriting everybody is pretty well adjusted and there isn't any police-type trouble. They get a little noisy with liquor but that's about it.

This time I went. He was there, being stared at by the whole of Benton's younger set, and I noticed that the gals looked sharper than usual. Tom Harth, the Used Aircar dealer was there, and he never goes to those dances. Big Fellom from the brickyard was there and neither does he. Also, Doc Roydan was there.

"Staying out of trouble?" I asked Arnold Vivian.

He shrugged, giving me the cold eye. "The only trouble I ever have is with pictures on canvas."

"If you get drunk and sign a job contract with the brickyard or Tom Harth, you'll forget pictures," I told him.

"I'm immune to job contracts."

"If you leave the dance hall with any of these girls—"

He laughed in my face. He sure played it right. He listened to Tom Harth and big Fellom—and they listened to him. In the end they left the hall with a couple of his pictures under their arms. And he played Lucille Wentworth against Alice Harth and the rest against the rest and had a very good time and didn't try anything you'd expect from a young guy with a non-written brain.

After the dance Doc Roydan was tugging at his sleeve.

"Son," he said, "a lot of fellows go over to the mayor's office after the dance for a little poker on Saturday nights. Figure you want to gamble a little?"

I shook my head at him, but he stared me down with the superior look of a guy who's a winner against a guy who's a loser.

"I heard you used to sing, Horner," he said. He linked his arm with Doc's thin wing. "Why don't you come along to the game and give us some laughs?"

"Maybe I will," I said, "since you're probably going to give me some later." I knew what the boys wanted. To take his money so he'd have to quit painting and go to work in Benton.

But he was too quick for the boys. When we broke it up at 3:00 a.m. he was the winner, and for my troubles I had ten bucks less than I started with. He went out grinning, thanking us all for an entertaining evening and they were all griping, all except Doc

who sat there, his close-set eyes glittering behind the thick spectacles.

"Imagine him taking me for thirty bucks," he said, making his smile that wasn't one. "Imagine."

"He knows people, he knows cards, he knows women," I said. "You're not gonna brainwrite that boy."

He gave me his ugly twitch. "Want to bet?" he said. I bet him five. I went home humming "'Roamin' Free As The Breeze.'"

Sunday night is the deadest night of all in Benton. I rolled in early and had sawed a pretty fair amount of wood when the emergency teletalker began to screech by the bedside. I was up and putting on clothes before I could remember who I was but I snapped out of it in a rush when I saw the pinched face of Doc Roydan on the screen.

"You'd better come scootin'," he said. "There's been a crime. Tony Holland's shack out on the edge of the hollow."

My heart sank. "Tony Holland!"

"Somebody's got to keep an eye on our citizens if the police force can't," said Doc. "It's a good thing I was out this way."

I got over there fast. Tony Holland would be called a town character in most places, but actually he's just another oldish man with no family and no particular skills who does odd jobs around the town. There isn't a thing wrong with him except one or

two little peculiarities like the way he handles money and the way he cottons up to Doc Roydan. He lives in a house on the edge of town which I refuse to call a shack. It needs a coat of paint; so do plenty of other houses in town. It's a little run-down, but I don't always cut my grass either. But the thing that bothered me was that Tony Holland is a hypochondriac. At his age he thinks he has all kinds of mental troubles—and he keeps going back to Doc Roydan to get brain-written. Like some men spend money on liquor, he spent his on getting Doc's services, and he's been two or three operations in arrears for the last ten years. Likewise Doc is always dropping by there to check up on his most steady customer and lap up some of the praise Tony dishes out to him. Tony thinks Doc invented the sun.

I found him lying on his bed with a big gash on his head. Doc was pacing the floor looking serious. Tony began yelling as soon as I came in.

"They got away with three hundred and two dollars and eleven cents," he said. "They bashed me on the head and stole all my savings."

"Somebody who's been watching this place," said Doc. "Somebody who's sneaked in here and gone over the place at his leisure, way I figure it."

My nerves began to twang a little.

"Yesterday my money was all right," moaned Tony. "Today I got

a hundred dollars back on a loan from my brother in Ellenstown. I was going to add it to what I had and put it in the bank tomorrow. I was counting it, standing over there and suddenly I knew there was somebody in the room. On account of my senses being real clear after that last brainwriting of Doc's. And just then I got hit with a club, or some kind of blunt instrument."

"Now don't tell me it was a passing tramp," said Doc, his eyes narrowly on me. "Since brainwriting there aren't any tramps."

"I didn't say anything," I said, looking at Tony's wound. It was a nasty one, all right.

"And don't say it was anyone in town," said Doc. "Because they've all been brainwritten by me, and they're adjusted and wouldn't commit no crimes."

I swallowed hard, feeling my stomach queasy. "Who do you figure?" I forced myself to say.

"Might be somebody around who wanders in the Hollow in the daytime, poking around and pretending to be what he ain't," said Doc.

"I know it wasn't Arnold Vivian," I said looking him in the eye.

"How do you know?"

"Because he's not that stupid," I said. "He knows he'd be the most likely suspect."

"Maybe you'd just better check on him, Henry," said Doc, setting his feet wide apart.

I got mad at that because the set-up was so corny. Find Vivian guilty in the town court and Doc would get to brainwrite him. And the town of Benton would have another hard-working, useful and adjusted citizen. Only it seemed like to me that somebody had to travel around and paint pictures—and sing on the stage—and go into strange places and come back with the story of how the other half lives.

"Doc," I said, "you're the Brainwriter. They call you in after the maladjusted guy has been caught. But I'm the cop. I run my investigations the way I want. I'm not going to build a case against Arnold Vivian."

Doc blew his stack then. He has a big reputation around town, and most people back down when he blows, but I was pretty sure that the town wouldn't go for a frame-up. Anyway, I wouldn't.

"What're you gonna do?" shouted Doc at me, tugging on my sleeve, after I wrote down the facts and started out the door.

"You write on brains; try reading one," I said and left.

I was pretty sure that either Doc did the head-banging or he and Tony arranged it between them.

I went to Mrs. Barton's and routed Arnold Vivian out. While he was sleepily pulling on his clothes I took a real good look around the room and I knew he was clear. Not on clues—

but just taking a look at his pictures. Nobody ever painted with that loving care if he was really in the thief business. The guy was good. I told him what was up and he lost some of his smile.

"Don't be ridiculous," he said. "I just took you people at poker for enough money to live for three weeks. Why should I commit a robbery and end up in the clutches of that miserable head-scribbler of yours?"

"Let me ask you if you've missed any of *your* stuff," I said.

He looked funny. "Missed anything? Not unless it's my pen and pencil set I lost jumping around at the dance last night."

We looked at each other, and his eyes got cold. "That would make a fine clue, wouldn't it?" he said. "At the scene of the crime."

"It would."

"Was it found—over there?"

"Not yet, but it will be."

He looked worried.

"Listen," I said. "Tony Holland has one peculiarity. He marks twenty dollar bills. Not ones or fives or tens, but only twenties. Figures he can follow how the money goes around town that way. Just be sure that you don't pick up any of Tony's twenty dollar bills."

"That wouldn't be evidence," said Vivian. "I spend money in town and get change. If his bills were floating around town—"

"But not twenties," I cut in. "Un-

less you change fifties or hundreds you wouldn't be getting his twenties as change. You'd be changing your own twenties. And since you don't draw any money from the local bank or in salary—you'd just better not have any local twenty dollar bills marked by Tony."

"Whose side are you on?" he asked, still puzzled.

"I used to sing baritone, remember?" I said.

He looked at me and grinned. Suddenly he reached out his hand. "Police, I like you," he said.

At that moment Doc Roydan came barging in like he was owner of the place. He pretty much goes anywhere in Benton.

"Look what we found at Tony's," he said. "Look—"

"I know," I sighed. "You've found a clue—a pen or pencil or both." I turned to Arnold Vivian. "Vivian, I'd better run you in. At least until we can investigate further. It will look better."

"Why certainly," said Arnold pleasantly. "No trouble at all, Mr. Horner. Glad to come along."

And he came along and we left Doc standing there waving a pencil helplessly in the air.

By noontime they held the hearing before Judge Tuttle. I'm sorry we've got a judge named Tuttle because whenever people from the City hear his name they shake their heads, but



his name happens to be Tuttle. He's not a bad chap, was a good football player before he got brainwritten. I had heard some of the talk against Vivian around town, so I forced the hearing right away, figuring that Vivian could be cleared and then leave town if he had any sense. He figured the same, that it wasn't healthy to hang around a place that needed new talent so bad, and promised to move on right after the hearing. He left it up to me.

A lot of curious people wandered in, since it was noon hour, and the hearing began with Tony telling his story and then Doc telling his side and cleverly getting in a lot of stuff about everybody in town being adjusted and no strangers except Arnold being around. Naturally Tuttle struck all that from the record, but naturally he remembered it. I told my piece about Arnold being far away from the place of the theft and sound asleep. I tried to get in a few hints of my own about how Doc and other people in town wanted young guys like Arnold awful bad, but I was blocked because they don't listen to me like they do to Doc.

There was quite a tussle about the pen and pencil. I hadn't seen it at the scene of the crime, but Doc and Tony swore it was there and made a big point about my not making a real investigation.

"Are you claiming that I shirked my duty?" I shot at Doc.

"All I say," said Doc, "is that



you've had a lot more experience with giving parking tickets than robberies, Henry."

There was a chuckle at that, because everybody does a double-think on those parking tickets. They know I got to do a job, but they hate those tickets. The pen and pencil were admitted into the evidence. Arnold shot me a worried look.

Then suddenly we were talking about marked twenty dollar bills. I knew I had 'em stopped there, because I'd rushed right from Tony's to Mrs. Barton's and taken a look around and then hustled Arnold to jail. If they tried to plant the supposedly stolen money in his room, they'd better look out because with my testimony that there wasn't any, it was too raw to get away with. And I knew there hadn't been any twenty dollar bills passed around at the poker game because I was there and a ten was the biggest bill on the table at any time, so I figured Arnold was safe and made a sign for him to let them go ahead and run it to the ground and make fools of themselves.

"Have you ever cashed any checks in town and gotten any twenty dollar bills here locally?" asked Tuttle.

Arnold smiled. "I learned a long time ago not to try to cash checks, as a stranger, in a small town."

"Have you ever changed fifties or hundreds and gotten our local twenties in exchange?"

Arnold waved a hand. "In towns

like Benton," he said, "the merchants don't change fifties or hundreds for strangers either."

Everybody grinned at that. At any of our shops they scream the eagle-scream whenever you try to change a twenty, let alone a fifty or a hundred.

"Have you ever received wages or loans from any local citizens which would've included Tony's marked bills?" asked the judge.

"I'm afraid my art doesn't inspire banking confidence," smiled Arnold.

"Then if you have any of Tony's marked twenty dollar bills, it'd be pretty hard to explain," said Judge Tuttle.

Arnold nodded. "I couldn't possibly have any of your local twenties, judge. That is, unless—"

Suddenly a look of horror came over his face. He turned on me and shouted something vile and got up and tried to run out of the room. I grabbed him, feeling everything flying apart. He was struggling with me and shouting. The place was in a turmoil. He gave me one blasting look of hate and slugged me. And I slugged him back and he went down limp and I was standing there feeling foolish, trying to figure what had gone wrong with a guy so honest and carefree and talented. A guy that was like myself twelve years ago.

Sure, there were a couple of Tony's marked twenties in his pocket. Not in his wallet where he had already

looked, but stuffed in his shirt pocket—where he'd put 'em the night of the dance—when he'd sold a couple of his pictures to Tom Harth and Big Fellom. He fought that point bitterly, and I did what I could, but Big Fellom and Tom Harth both insisted that they hadn't given him any marked bills. Everybody in town is always looking for Tony's marked bills and telling him about them; it's a sort of local tradition, and you'd know if you had one, and they perjured themselves that they didn't. And Doc Roydan sat there, nodding and smiling, and I thought I saw some looks pass between him and Tom and Big Fellom. One local citizen can't rig a frame, not even two. But three prominent local citizens—

The guys had never even given Vivian a chance. They meant to get him and they weren't even trusting him to make his own mistakes. The hearing turned into a trial right then. Tuttle found him guilty and ordered him to produce Tony's money. Naturally he couldn't and so the judge ordered him to be brainwritten to get rid of the hostilities that made him steal and then to go to work in town long enough to pay back Tony's money. That was enough—he'd be a local fixture after that.

"There's just one thing I want to say," said Arnold at the end. "I've seen a lot of raw deals, but the way you have it here with the singing cop to set it up is the slickest I ever saw.

You win."

"Henry helps a lot," Doc shot back, "even when he doesn't always know it."

I had to be present at the brainwriting. It's the law. Arnold sat there pretty pale and shaken because he knew that when Doc finished with him, he was going to see the world differently. It was a good thing he was beaten because I wasn't able to push him around. He went docilely and sat in the chair of his own volition; I couldn't have applied force if I wanted. I was torn apart by the frame-up, but every time I got good and mad, everything creamed up the way it was supposed to and I found myself thinking what a lucky guy Arnold was to stay in our town and find himself a local girl and settle down and help get the world's work done. That was Doc's brainwriting on me, of course.

Doc's nurse gave him the needle jab in the back of the neck and after that he sat there like a stone man, unable to speak as the fluid took hold of his brain.

Doc had a big computer in there and the usual power boosters. No use for me to describe it since most of us now have been inside a Brainwriter's surgery. Doc took a big globe of soft clay and fixed it on the computer and shaved it away until it looked like a brain. Then he brought down the cover that had the automatic stylus,

crooning like some old witch over a caldron.

"Social advancement," said Doc. "The greatest thing that ever happened to the human race. Did away with psychiatry inside of five years."

He was lecturing me and Arnold who could still hear, of course, because he had to be conscious, though paralyzed.

"All the centuries," lectured Doc, "we acted like fools instead of men. We tried to fit the environment to the person instead of the person to the environment. The result was breakdowns. Too many breakdowns all over the place. Long-forgotten hostilities of childhood breaking out—a man picked up a gun and stepped into the street and shot down three or four strangers. All because we couldn't control a small mass of neural tissue, the brain."

"Why don't you just shut up and do your stuff," I begged him.

"Why, Henry," he grinned, "don't you want to learn? Want to be stupid all your life?"

The computer was working now—only in reverse. A rubber pad like a helmet covered Arnold's head. Electronic fingers dug into his brain and measured it. The result raced across the room to the soft clay model of his brain. The automatic stylus above the soft clay traced electronic signals and a duplicate of Arnold's brain appeared out of the soft clay.

"I learned too much already," I

said. "The brain is simply a mass of neural tissue. The neural tissue's got a pattern of synapses, or jump-across responses to stimuli. If a guy's got hostilities, they can be traced back to the physical, to bad synapses. So you erase 'em and carve a few good ones, and the guy's adjusted from then on. Everybody does what they should and you don't need no religion, or morals, or psychology, or nothing. Just brainwriting and the world's work gets done."

Doc shook his head sadly: "Henry, you always miss the most important part of all. After I get rid of the illogical synapses, I do one special cut with my stylus. That's the happiness effect. Then your adjusted man not only does what he ought to do—he's happy about it."

"Where everything creams up," I said bitterly.

He shot me a funny look. "Yeah," he said, looking at me doubtfully. "You could say that. We've given the world the happiness effect."

He was at the halfway point now. The soft clay model was finished. It was an exact duplicate of Arnold's brain. Arnold sat facing us like a corpse. I held my breath. Doc lifted up the clay model from its cradle and picked up his stylus.

"Quite a brain," he said. He pointed at several jointures in the interlaced mass of neural tubulations. "Decayed memory spots," he said.

"Artistic imagination—decayed sensory impressions, you know. Quite useless in an adjusted society."

His scalpel flicked and molded and the jointures—not actual tissue decay of course, but just incomplete memory bridges—were totally eradicated. That slight break in memory connections that allowed for dissociation, for the forming of new patterns, for the invention of things as they weren't—for art. He did some other writing with his stylus on the clay model, consulting prototype clay brains and some books. He pattered around and fussed for quite a while. An artist on his own, I had to admit. They never snapped back after sitting in that chair. He even went outside a minute to pick up the master brain he uses in the waiting room to impress us poor devils. That was when I picked up his scalpel and made a quick stab on the clay model at one of the places he'd shaved down. Maybe I could save a hostility or two for Arnold.

Doc came back, finished and set the rewritten, remolded brain complete with its happiness effect back in the cradle. He reversed the power. The big moment had come.

The light of power—power over his fellows—danced in Doc's eyes. He jittered around enjoying himself for a moment. "This is the real moment of birth, Henry," he told me, exulting. "Most people are born wrong for this world. This is where they get right!"

I held my breath. My muscles worked against themselves, but I had the happiness effect too, and a part of me, most of me, wanted the job to be done.

Doc's hand closed a switch. Now the automatic stylus read the new brain shape delicately and flashed the electronic signals to the pad on Arnold's head. There was a surge of power and the brain, the real, living brain tissue in Arnold's head, shifted to conform to the brain that Doc Roydan had rewritten.

Arnold screamed at the stab of blinding pain. I growled in my throat. There was a tense moment while we waited to see if it had been a success, because too much of a tissue shift meant a brain hemorrhage and death. But Doc's an old-timer. He never misses. Arnold kept on living and breathing.

"Well, Henry, we did it," he said with a satisfied sigh. "We've created a useful citizen."

"Hurrah for the Social Adjustment Act of 2150," I said tonelessly.

It took Arnold Vivian six months to pay back the money he was supposed to have stolen. But in three months' time he was married and a year later he was a father. He got a job and got a house and became one of us. He gave up painting, except—

ARNOLD VIVIAN—LAST EXHIBITION  
These are the last of the pictures made when I first came to Benton, including views of

Willow Hollow and some views of local citizenry. They are for sale.

Arnold Vivian.

I stared at the sign on the bulletin board in the town's Meeting Room. I did a double-take when I saw the crowd that was going in there. I wouldn't pick more than a half-dozen local citizens as likely prospects for a picture exhibition. But here were dozens of them pouring into the small building and coming out with amused, delighted expressions on their faces. I went inside to see what it was all about. It was about plenty.

Nobody was paying any attention to the landscapes which we already knew too well. Everybody was clustered around a series of pictures of Doc Roydan. Arnold had painted more than fifty of them—everything from wash drawings to full oils. Only the close-set eyes were more than close-set and the glasses were larger than life and the small body was grotesque. In one scene Doc was tugging at my sleeve. In another he was whispering evilly to a local girl—I thought I recognized Lucille Wentworth. He was shown at the Council meeting, at church, at the dance—at every social function, his ridiculous features contorted into every grimace of deceit, power-lust, conniving—

Every single picture was entitled "The Happiness Effect" and every one was marked "Sold" already. At a glance it was as funny as a comic strip and as tragic as life—the life

and death of Benton.

I took one look at the long series and knew that Doc Roydan was through in Benton. Arnold had said on canvas what all of us had felt about Doc but been unable to verbalize in our brainwritten minds.

There was a whirl and flash behind me and a vicious tugging at my sleeve.

"This is outrageous! Illegal! I'll sue!"

Doc Roydan had come to his own funeral. People were standing around smiling and laughing. Arnold himself, with his sleeker, contented look was there watching us quizzically.

"You better not sue, Doc," I said, concealing a smile. "You could win, but those pictures would be picked up in papers all over the state in case of a public trial."

"It's illegal! It's destroying my reputation. You're the law. Close this exhibition at once and seize those pictures. I want them burned!"

Doc was practically dancing around in his fury. For the first time in my life I did the sleeve-plucking. In fact, I took him firmly by the arm and led him to the door.

"Here now," I said, "I'm not going to have you disturbing the peace at a public function."

"But I'll be ruined!" he cried. "Why, every house in Benton will have one of those lying pictures."

"The Social Adjustment Act of 2150 does not prohibit the painting of,

exhibiting, or sale of pictures," I said. "As for your being ruined, I guess that's fair enough. You ruined Arnold as an artist. He ruined you as a Brain-writer, at least as far as Benton goes. Looks to me like you'll have to get a transfer to another town, Doc."

"Big Fellom and Tom Harth and Tony are in those pictures, too. They'll—"

"They won't do anything," I said coldly. "They're on my list already, and they know if they get funny I've got enough local ordinances to close their businesses up completely—maybe drive 'em out of town. I'm the law—and this time public opinion is on my side."

Then for the first time I can remember, Doc was pleading.

"Henry, please. I'm too old to start over in another town. I've got to stay in Benton. Please, Henry, get rid of those pictures—"

"Why, Doc," I said, "it sounds to me like you're maladjusted to your environment. You oughta be brain-written—with the happiness effect."

And I winked at Arnold and the people standing around us chuckled. Then Doc was walking up the street alone—up the street and out of our lives.

"Thanks," said Arnold, "for saving a piece of my talent with Doc's scalpel."

"Thanks," I said, "for giving us back a little human dignity."

We shook hands, creaming it up a bit in the happiness effect.

THE END

## THE TEST


There was once a canny Scot who published an advertisement saying: "One Million Dollars Reward! I will pay one million dollars to anyone who can demonstrate a technique for changing an unwilling mind."

An applicant interested in determining the test that would be applied was told: "I haven't the slightest intention of paying anyone one red cent. Change my mind."





# POTENTIAL BY ROBERT SHECKLEY



*He was one man, horribly confused, escaping from a destroyed planet, carrying some sort of message which he couldn't recall. But he had tremendous potential for achievement!*

Illustrated by A. Sussman

He returned to consciousness slowly, aware of aches and bruises, and an agonizing knot in his stomach. Experimentally, he stretched his legs.

They didn't touch anything, and he realized that his body was unsupported. He was dead, he thought. Floating free in space—

Floating? He opened his eyes. Yes, he was floating. Above him was a ceiling—or was it a floor? He resisted a strong urge to scream; blinked, and his surroundings swam into focus.

He realized that he was in a spaceship. The cabin was a shambles. Boxes

and equipment drifted around him, evidently ripped loose from their moorings by some sudden strain. Burnt-out wires ran across the floor. A row of lockers along one wall had been fused into slag.

He stared, but no recognition came. As far as he knew, he was seeing this for the first time. He raised a hand and pushed against the ceiling, drifted down, pushed again, and managed to grasp a wall rail. Holding this tightly, he tried to think.

“There is a logical explanation for all this,” he said aloud, just to hear his own voice. “All I have to do is remember.” Remember—

What was his name?

He didn't know.

“Hello!” he shouted. “Is there anyone here?” His words echoed between the ship's narrow walls. There was no answer.

He propelled himself across the cabin, ducking to miss the floating boxes. In half an hour he knew he was the only person aboard the ship.

He pushed himself back to the front of the ship. There was a padded chair there, with a long panel in front of it. He strapped himself into the chair and studied the panel.

It consisted of two blank screens,

one much larger than the other. Under the large screen were two buttons, marked *vision-front*, and *vision-back*. A dial beneath the buttons was calibrated for focus. The small screen was unmarked.

Not finding any other controls, he pushed the *vision-front* button. The screen cleared, showing black space with the brilliant points of the stars before him. He stared at it for a long time, open-mouthed, then turned away.

The first thing to do, he told himself, was to assemble all the knowledge at his disposal and see what he could deduce from it.

"I am a man," he said. "I am in a spaceship, in space. I know what stars are, and what planets are. Let me see—" He had a rudimentary knowledge of astronomy, less of physics and chemistry. He remembered some English literature, although he couldn't think of any writers except Traudzel, a popular novelist. He remembered the authors of several history books, but couldn't place their contents.

He knew the name for what he had: Amnesia.

Suddenly, he had a great desire to see himself, to look at his own face. Surely, recognition and memory would follow. He shoved himself across the room again, and started searching for a mirror.

There were lockers built into the walls, and he opened them hastily, spilling the contents into the weight-

less air. In the third locker he found a shaving kit and a small steel mirror. He studied the reflection anxiously.

A long irregular face, drained of color. Dark stubble growing on the chin. Bloodless lips.

The face of a stranger.

He fought down fresh panic and searched the cabin, looking for some clue to his identity. Quickly he pawed through the floating boxes, shoving them aside when they proved to contain nothing but food or water. He looked on.

Floating in one corner of the cabin was a sheet of scorched paper. He seized it.

"Dear Ran," it began. "The biochem boys have been doing some hurry-hurry last-minute checking on the pento. Seems there's a strong chance it might induce amnesia. Something about the strength of the drug, plus the near-traumatic experience you're undergoing, whether you're aware of it or not. *Now* they tell us! Anyhow, I'm dashing off this note at zero minus fourteen minutes, just as a refresher for you in case they're right.

"First, don't look for any controls. Everything's automatic, or it should be if this pile of cardboard and glue holds together. (Don't blame the technicians; they had practically no time to get it finished and away before flash moment).

"Your course is set for automatic

planetary selection, so just sit tight. I don't suppose you could forget Marselli's theorem, but in case you have, don't worry about landing among some eighteen-headed intelligent centipedes. You'll reach humanoid life because it *has* to be humanoid life.

"You may be a bit battered after blastoff, but the pento will pull you through. If the cabin is messy, it's because we just didn't have time to check everything for stress-strain tolerances.

"Now for the mission. Go at once to Projector One in Locker Fifteen. The projector is set for self-destruction after one viewing, so make sure you understand it. The mission is of ultimate importance, Doc, and every man and woman on Earth is with you. Don't let us down."

Someone named Fred Anderson had signed it.

Ran—automatically using the name given in the letter—started looking for Locker Fifteen. He found at once where it had been. Lockers Eleven through Twenty-five were fused and melted. Their contents were destroyed.

That was that. Only the scorched paper linked him now with his past, his friends, all Earth. Even though his memory was gone, it was a relief to know that the amnesia had an explanation.

But what did it mean? Why had they thrown the ship together in such a rush? Why had they placed him in it—alone—and sent him out? And

this all-important mission—if it was so vital, why hadn't they safeguarded it better?

The note raised more questions than it answered. Frowning, Ran pushed himself back to the panel. He looked out the screen again, at the spectacle of the stars, trying to reason it out.

Perhaps there was a disease. He was the only person not infected. They had built the ship and shot him out to space. The mission? To contact another planet, find an antidote, and bring it back—

Ridiculous.

He looked over the panel again, and pushed the button for *vision-rear*.

And almost fainted.

A glaring, blinding light filled the entire screen, scorching his eyes. Hastily he cut down the field of focus, until he was able to make out what it was.

A nova. And the letter had mentioned the flash-moment.

Ran knew that Sol was the nova. And that Earth was consumed.

There was no clock on the ship, so Dr. Ran had no idea how long he had been traveling. For a long time he just drifted around dazed, coming back to the screen constantly.

The nova dwindled as the ship speeded on.

Ran ate and slept. He wandered around the ship, examining, searching. The floating boxes were in the

way, so he started to pull them down and secure them.

Days might have passed, or weeks.

After a while, Ran started to put the facts he knew into a coherent structure. There were gaps and questions in it, probably untruths as well, but it was a beginning.

He had been chosen to go in the spaceship. Not as a pilot, since the ship was automatic, but for some other reason. The letter had called him "doc". It might have something to do with his being a doctor.

Doctor of what? He didn't know.

The makers of the ship had known Sol was going nova. They couldn't, evidently, rescue any sizable portion of Earth's population. Instead, they had sacrificed themselves and everyone else to make sure of rescuing him.

Why him?

He was expected to do a job of the greatest importance. So important that everyone had been subordinated to it. So important that the destruction of Earth itself seemed secondary, as long as the mission was accomplished.

What could that mission be?

Dr. Ran couldn't conceive of anything so important. But he had no other theory that came even close to fitting the facts as he knew them.

He tried to attack the problem from another viewpoint. What would he do, he asked himself, if he knew that Sol was going nova in a short time, and he could rescue only a limited number of

people with a certainty of success?

He would have sent out couples, at least one couple, in an attempt to perpetuate human stock.

But evidently the leaders of Earth hadn't seen it that way.

After a time, the small screen flashed into life. It read: *Planet. Contact 100 hours.*

He sat in front of the panel and watched. After a long time the digits changed. *Contact 99 hours.*

He had plenty of time. He ate, and went back to work getting the ship into what order he could.

While he was storing boxes in the remaining lockers, he found a carefully packaged and fastened machine. He recognized it as a projector at once. On its side was engraved a large "2".

A spare, he thought, his heart pounding violently. Why hadn't he thought of that? He looked into the viewer and pushed the button.

The film took over an hour. It started with a poetic survey of Earth; flashes of her cities, fields, forests, rivers, oceans. Her people, her animals, all in brief vignettes. There was no sound track.

The camera moved to an observatory, explaining its purpose visually. It showed the discovery of the Sun's instability, the faces of the astrophysicists who discovered it.

Then the race against time began, and the rapid growth of the ship. He saw himself, running up to it, grinning

at the camera, shaking someone's hand, and disappearing inside. The film stopped there. They must have stored the camera, given him the injection, and sent him off.

Another reel started.

"Hello, Ran," a voice said. The picture showed a large, calm man in a business suit. He looked directly at Ran out of the screen.

"I couldn't resist this opportunity to speak to you again, Dr. Ellis. You're deep in space now, and you've undoubtedly seen the nova that has consumed Earth. You're lonely, I daresay.

"Don't be, Ran. As representative of Earth's peoples, I'm taking this final chance to wish you luck in your great mission. I don't have to tell you that we're all with you. Don't feel alone."

"You have, of course, seen the film in Projector One, and have a thorough understanding of your mission. This portion of film—with my face and voice on it—will be automatically destroyed, in the same way. Naturally, we can't let extraterrestrials in on our little secret yet.

"They'll find out soon enough. You can feel free to explain anything on the remainder of this film to them. It should win you plenty of sympathy. Make no reference, of course, to the great discovery or the techniques that stemmed from it. If they want the faster-than-light drive, tell them the truth—that you don't know how it's

propagated, since it was developed only a year or so before Sol went nova. Tell them that any tampering with the ship will cause the engines to dis-solve.

"Good luck, doctor. And good hunting." The face faded and the machine hummed louder, destroying the last reel.

He put the projector carefully back in its case, tied it into the locker, and went back to the control panel.

The screen read: *Contact 97 hours.*

He sat down and tried to place the new facts into his structure. As background, he remembered vaguely the great, peaceful civilization of Earth. They had been almost ready to go for the stars when the Sun's instability was found. The faster-than-light drive had been developed too late.

Against that background he had been selected to man the escape ship. Only him, for some unfathomable reason. The job given him was thought more important, evidently, than any attempts at race-survival.

He was to make contact with intelligent life, and tell them about Earth. But he was to withhold any mention of the greatest discovery and its resulting techniques.

Whatever they were.

And then he was to perform his mission—

He felt as though he could burst. He couldn't remember. *Why* hadn't the fools engraved his instructions on bronze?

*What could it be?*

The screen read, *Contact 96 hours.*

Dr. Ran Ellis strapped himself into the pilot chair and cried from sheer frustration.

The great ship looked, probed and reported. The small screen flashed into life. *Atmosphere-chlorine. Life-nonexistent.* The data was fed to the ship's selectors. Circuits closed, other circuits opened. A new course was set up, and the ship speeded on.

Dr. Ellis ate and slept and thought.

Another planet was reported, examined and rejected.

Dr. Ellis continued thinking, and made one unimportant discovery.

He had a photographic memory. He discovered this by thinking back over the film. He could remember every detail of the hour-long spectacle, every face, every movement.

He tested himself as the ship went on, and found that the ability was a constant. It worried him for a while, until he realized that it was probably a factor in his selection. A photographic memory would be quite an asset in learning a new language.

Quite an irony, he thought. Perfect retention—but no memory.

A third planet was rejected.

Ellis outlined the possibilities he could think of, in an effort to discover the nature of his mission.

To erect a shrine to Earth? Possibly. But why the urgency, then, the stressed importance?

Perhaps he was sent out as a teacher. Earth's last gesture, to instruct some inhabited planet in the ways of peace and co-operation.

Why send a doctor on a job like that? Besides, it was illogical. People learn over millennia, not in a few years. And it just didn't fit the *mood* of the two messages. Both the man in the film and the note-writer had seemed practical men. It was impossible to think of either of them as altruists.

A fourth planet came into range, was checked and left behind.

And what, he wondered, was the "great discovery"? If not the faster-than-light drive, what could it be? More than likely a philosophical discovery. The way man could live in peace, or something like that.

Then why wasn't he supposed to mention it?

A screen flashed, showing the oxygen content of the fifth planet. Ellis ignored it, then looked up as generators deep in the body of the ship hummed into life.

*Prepare for landing,* the screen told him.

His heart leaped convulsively, and Ellis had a momentary difficulty breathing.

This was it. A terror filled him as gravitation tugged at the ship. He fought it, but the terror increased. He screamed and tore at his straps as the ship started to go perceptibly *down*.

On the big screen was the blue and

green of an oxygen planet.

Then Ellis remembered something. "The emergence from deep space into a planetary system is analogous to the emergent birth-trauma." A common reaction, he told himself, but an easily controllable one for a psychiatrist—

A psychiatrist!

Dr. Randolph Ellis, psychiatrist. He knew what kind of doctor he was. He searched his mind for more information, fruitlessly. That was as far as it went.

Why had Earth sent a psychiatrist into space?

He blacked out as the ship screamed into the atmosphere.

Ellis recovered almost at once as the ship landed itself. Unstrapping, he switched on the vision-ports. There were vehicles coming toward the ship, filled with people.

Human-appearing people.

He had to make a decision now, one that would affect the rest of his time on this planet. What was he going to do? What would his course of action be?

Ellis thought for a moment, then decided he would have to play by ear. He would extemporize. No communication would be possible until he had learned the language. After that, he would say that he was sent from Earth to . . . to—

What?

He would decide when the time came. Glancing at the screens, he saw

that the atmosphere was breathable.

The side of the ship swung open, and Ellis walked out.

He had landed on a subcontinent called Krel, and the inhabitants were Krelans. Politically, the planet had reached the world-government stage, but so recently that the inhabitants still were identified with the older political divisions.

With his photographic memory Ellis found no difficulty learning the Krelan language, once a common basis had been established for key words. The people, of the common root Man, seemed no more foreign than some members of his own race. Ellis knew that this eventuality had been predicted. The ship would have rejected any other. The more he thought of it, the more he was certain that the mission depended on this similarity.

Ellis learned and observed, and thought. He was due, as soon as he had mastered the tongue sufficiently, to meet the ruling council. This was a meeting he dreaded, and put off as long as he could.

Nevertheless, the time came.

He was ushered through the halls of the Council Building, to the door of the Main Council Room. He walked in with the projector under his arm.

"You are most welcome, sir," the leader of the council said. Ellis returned the salutation and presented his films. There was no discussion

until everyone had seen them.

"Then you are the last representative of your race?" the council leader asked. Ellis nodded, looking at the kindly, seamed old face.

"Why did your people send only you?" another council member asked. "Why weren't a man and woman sent?" The same question, Ellis thought, that I've been asking myself.

"It would be impossible," he told them, "for me to explain the psychology of my race in a few words. Our decision was contained in our very sense of being." A meaningless lie, he thought to himself. But what else could he say?

"You will have to explain the psychology of your race sometime," the man said.

Ellis nodded, looking over the faces of the council. He was able to estimate the effect of the beautifully prepared film on them; they were going to be pleasant to this last representative of a great race.

"We are very interested in your faster-than-light drive," another council member said. "Could you help us attain that?"

"I'm afraid not," Ellis said. From what he had learned, he knew that their technology was pre-atomic, several centuries behind Earth's.

"I am not a scientist. I have no knowledge of the drive. It was a late development."

"We could examine it ourselves," a man said.

"I don't think that would be wise," Ellis told him. "My people consider it inadvisable to give a planet technological products beyond their present level of attainment." So much for theory. "The engines will overload if tampered with."

"You say you are not a scientist," the old leader asked pleasantly, changing the subject. "If I may ask, what are you?"

"A psychiatrist," Ellis said.

They talked for hours. Ellis dodged and faked and invented, trying to fill in the gaps in his knowledge. The council wanted to know about all phases of life on Earth, all the details of technological and social advances. They wondered about Earth's method of pre-nova detection. And why had he decided to come here? And finally, in view of coming alone, was his race suicidally inclined?

"We will wish to ask you more in the future," the old council leader said, ending the session.

"I shall be happy to answer anything in my power," Ellis said.

"That doesn't seem to be much," a member said.

"Now Elgg—remember the shock this man has been through," the council leader said. "His entire race has been destroyed. I do not believe we are being hospitable." He turned to Ellis.

"Sir, you have helped us immeasurably as it is. For example, now that



we know the possibility of controlled atomic power, we can direct research toward that goal. Of course, you will be reimbursed by the state. What would you like to do?"

Ellis hesitated, wondering what he should say.

"Would you like to head a museum project for Earth? A monument to your great people?"

Was that his mission, Ellis wondered? He shook his head.

"I am a doctor, sir. A psychiatrist. Perhaps I could help in that respect."

"But you don't know our people," the old leader said concernedly. "It would take you a lifetime to learn the nature of our tensions and problems. To learn them in sufficient intimacy to enable you to practice."

"True," Ellis said. "But our races *are* alike. Our civilizations have taken like courses. Since I represent a more advanced psychological tradition, my methods might be of help to your doctors—"

"Of course, Dr. Ellis. I must not make the mistake of underestimating a species that has crossed the stars." The old leader smiled ruefully. "I myself will introduce you to the head of one of our hospitals." The leader stood up.

"If you will come with me."

Ellis followed, with his heart pounding. His mission must have something to do with psychiatry. Why else send a psychiatrist?

But he still didn't know what he

was supposed to do.

And, to make it worse, he could remember practically none of his psychiatric background.

"I think that takes care of all the testing apparatus," the doctor said, looking at Ellis from behind steel-rimmed glasses. He was young, moon-faced, and eager to learn from the older civilization of Earth.

"Can you suggest any improvements?" he asked.

"I'll have to look over the setup more closely," Ellis said, following the doctor down a long, pale-blue corridor. The testing apparatus had struck a complete blank.

"I don't have to tell you how eager I am for this opportunity," the doctor said. "I have no doubt that you Terrans were able to discover many of the secrets of the mind."

"Oh, yes," Ellis said.

"Down this way we have the wards," the doctor said. "Would you care to see them?"

"Fine." Ellis followed the doctor, biting his lip angrily. His memory was still gone. He had no more psychiatric knowledge than a poorly informed layman. Unless something happened soon, he would be forced to admit his amnesia.

"In this room," the doctor said, "we have several quiet cases." Ellis followed him in, and looked at the dull, lifeless faces of three patients.

"Catatonic," the doctor said, point-

ing to the first man. "I don't suppose you have a cure for that?" He smiled good-naturedly.

Ellis didn't answer. Another memory had popped into his mind. It was just a few lines of conversation.

"But is it ethical?" he had asked. In a room like this, on Earth.

"Of course," someone has answered. "We won't tamper with the normals. But the idiots, the criminally insane—the psychotics who could never use their minds anyhow—it isn't as though we were robbing them of anything. It's a mercy, really—"

Just that much. He didn't know to whom he had been talking. Another doctor, probably. They had been discussing some new method of dealing with defectives. A new cure? It seemed possible. A drastic one, from the content.

"Have you found a cure for it?" the moon-faced doctor asked again.

"Yes. Yes, we have," Ellis said, taking his nerve in both hands. The doctor stepped back and stared.

"But you couldn't! You can't repair a brain where there's organic damage—deterioration, or lack of development—" He checked himself.

"But listen to *me*, telling *you*. Go ahead, doctor."

Ellis looked at the man in the first bed. "Get me some assistants, doctor." The doctor hesitated, then hurried out of the room.

Ellis bent over the catatonic and looked at his face. He wasn't sure

of what he was doing, but he reached out and touched the man's forehead with his finger.

Something in Ellis' mind clicked.

The catatonic collapsed.

Ellis waited, but nothing seemed to be happening. He walked over to the second patient and repeated the operation.

That one collapsed also, and the one after him.

The doctor came back, with two wide-eyed helpers. "What's happening here?" he asked. "What have you done?"

"I don't know if our methods will work on your people," Ellis bluffed. "Please leave me alone—completely alone for a little while. The concentration necessary—" He turned back to the patients.

The doctor started to say something, changed his mind and left quietly, taking the assistants with him.

Sweating, Ellis examined the pulse of the first man. It was still beating. He straightened and started to pace the room.

He had a power of some sort. He could knock a psychotic flat on his back. Fine. Nerves—connections. He wished he could remember how many nerve connections there were in the human brain. Some fantastic number; Ten to the twenty-fifth to the tenth? No, that didn't seem right. But a fantastic number.

What did it matter? It mattered, he was certain.

The first man groaned and sat up. Ellis walked over to him. The man felt his head, and groaned again.

His own personal shock-therapy, Ellis thought. Perhaps Earth had discovered the answer to insanity. As a last gift to the universe, they had sent him out, to heal—

"How do you feel?" he asked the patient.

"Not bad," the man answered—in English!

"What did you say?" Ellis gasped. He wondered if there had been a thought-transfer of some sort. Had he given the man his own grasp of English? Let's see, if you reshunted the load from the damaged nerves to unused ones—

"I feel fine, Doc. Good work. We weren't sure if that haywire and cardboard ship would hold together, but as I told you, it was the best we could do under the—"

"Who are you?"

The man climbed out of bed and looked around.

"Are the natives gone?"

"Yes."

"I'm Haines, Representative of Earth. What's the matter with you, Ellis?"

The other men were reviving now.

"And they—"

"Dr. Clitell."

"Fred Anderson."

The man who called himself Haines

looked over his body carefully. "You might have found a better host for me, Ellis. For old time's sake. But no matter. What's the matter, man?"

Ellis explained about his amnesia.

"Didn't you get the note?"

Ellis told them everything.

"We'll get your memory back, don't worry," Haines said. "It feels good to have a body again. Hold it."

The door opened and the young doctor peered in. He saw the patients and let out a shout.

"You did it! You are able—"

"Please, doctor," Ellis snapped. "No sudden noises. I must ask not to be disturbed for at least another hour."

"Of course," the doctor said respectfully, withdrew his face and closed the door.

"How was it possible?" Ellis asked, looking at the three men. "I don't understand—"

"The great discovery," Haines said. "Surely you remember that? You worked on it. No? Explain, Anderson."

The third man walked over slowly. Ellis noticed that the vacuous faces were beginning to tighten already, shaped by the minds in back of them.

"Don't you remember, Ellis, the research on personality factors?"

Ellis shook his head.

"You were looking for the lowest common denominator of human-life-and-personality. The source, if you wish. The research actually started

almost a hundred years ago, after Orgell found that personality was independent of body, although influenced and modified by it. Remember now?"

"No. Go on."

"To keep it simple, you—and about thirty others—found that the lowest indivisible unit of personality was an independent nonmaterial substance. You named it the M molecule. It is a complex mental pattern."

"Mental?"

"Nonmaterial, then," Anderson said. "It can be transferred from host to host."

"Sounds like possession," Ellis said.

Anderson, noticing a mirror in a corner of the room, walked over to examine his new face. He shuddered when he saw it, and wiped saliva from its lips.

"The old myths of spirit-possession aren't so far off," Dr. Clitell said. He was the only one wearing his body with any sort of ease. "Some people have always been able to separate their minds from their bodies. Astral projection, and that sort of thing. It wasn't until recently that the personality was localized and an invariant separation-resynthesis procedure adopted."

"Does that mean you're immortal?" Ellis asked.

"Oh, no!" Anderson said, walking over. He grimaced, trying to check his host's unconscious drool. "The personality has a definite life span.

It's somewhat longer than the body's, of course, but still definitely within limits." He succeeded in stopping the flow. "However, it can be stored dormant almost indefinitely."

"And what better place," Haines put in, "for storing a nonmaterial molecule than your own mind? Your nerve connections have been harboring us all along, Ellis. There's plenty of room there. The number of connections in a human brain have been calculated at ten to the—"

"I remember that part," Ellis said. "I'm beginning to understand." He knew why he had been chosen. A psychiatrist would be needed for this job, to gain admittance to the hosts. He had been especially trained. Of course the Krelmans couldn't be told yet about the mission or the M molecule. They wouldn't take kindly to their people—even the defectives—being possessed by Earthmen.

"Look at this," Haines said. Fascinated, he was bending his fingers backwards. He had discovered that his host was double-jointed. The other two men were trying out their bodies in the manner of a man testing a horse. They flexed their arms, bunched their muscles, practiced walking.

"But," Ellis asked, "how will the race . . . I mean, how about women?"

"Get more hosts," Haines told him, still trying out his fingers. "Male and female. You're going to be the greatest doctor on this planet. Every defective will be brought to you for cure. Of

course, we're all in on the secret. No one's going to spill before the right time." He paused and grinned. "Ellis—do you realize what this means? Earth isn't dead! She'll live again."

Ellis nodded. He was having difficulty identifying the large, bland Haines in the film with the shrill-voiced scarecrow in front of him. It would take time for all of them, he knew, and a good deal of readjustment.

"We'd better get to work," Anderson said. "After you have the defectives on this planet serviced, we'll re-

fuel your ship and send you on."

"Where?" Ellis asked. "To another planet?"

"Of course. There are probably only a few million hosts on this one, since we're not touching normals."

"Only! But how many people have I stored?"

There was the sound of voices in the hall.

"You really are a case," Haines said, amused. "Back into bed, men—I think I hear that doctor. How many? The population of Earth was about four billion. You have all of them."

THE END

## THE ANALYTICAL LABORATORY

Lack of space has held out the Lab now and then before; with the present set-up, where the author's bonus hinges on the Lab vote, I'll try to get it in regularly.

### JULY 1953 ISSUE

<i>Place</i>	<i>Story</i>	<i>Author</i>	<i>Points</i>
1.	Mission of Gravity (Pt. IV)	Hal Clement	1.52
2.	Enough Rope	Poul Anderson	1.95
3 and 4.	Tied:		
	Solution Delayed	Mark Clifton and Alex Apostolides	2.92
	Survival	Don Green	2.92

### AUGUST 1953 ISSUE

1.	Sam Hall	Poul Anderson	2.29
2.	Commencement Night	Richard Ashby	2.76
3.	Crazy Joey	Mark Clifton and Alex Apostolides	2.81
4.	Share Our World	Chan Davis	3.6
5.	Pioneer	Lee Correy	3.63

I've guessed wrong on several of these bonus-winners; naturally, I intend to try to understand what sort of stories you want well enough to be able to spot the top winners beforehand. I'll learn!

THE EDITOR.

# Earthman Come Home

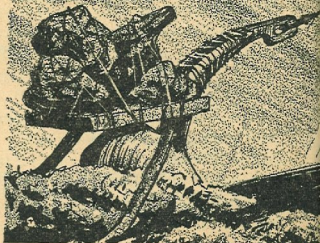
BY JAMES BLISH

*The Okies had come a long, long way . . . and were unwanted, as usual. For no isolated, static culture wants the stimulus of a more active, wider-ranging culture changing its rigid ways!*

Illustrated by Walt Miller

## I.

The city hovered, then settled silently through the early morning darkness toward the broad expanse of heath which the planet's Proctors had designated as its landing place. At this hour, the edge of the misty acres of diamonds which were the Greater Magellanic Cloud was just beginning to touch the western horizon; the whole cloud covered nearly 35° of the



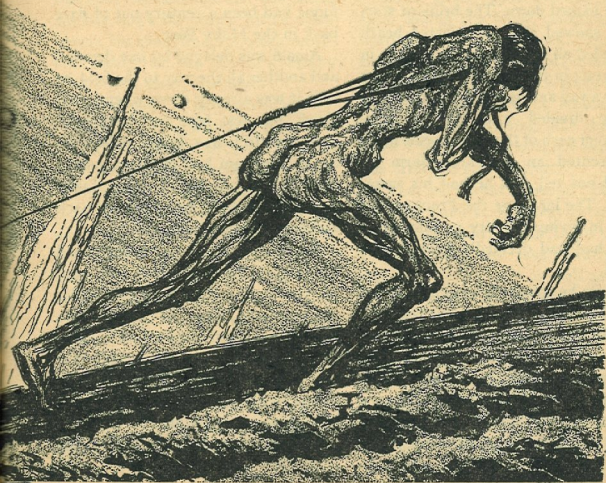
sky. The cloud would set at 5:12 a.m.; at 6:00 the near edge of the home galaxy would rise, but during the summer the sun rose earlier and would blot it out.

All of which was quite all right with Mayor Amalfi. The fact that no significant amount of the home galaxy would begin to show in the night sky for months was one of the reasons why he had chosen this planet to settle on. The situation confronting the city posed problems enough without its being complicated by an unsatisfiable homesickness.

The city grounded, and the last re-

sidual hum of the spindizzies stopped. From below there came a rapidly rising and more erratic hum of human activity, and the clank and roar of heavy equipment getting under way. The geology team was losing no time, as usual.

Amalfi, however, felt no disposition to go down at once. He remained on the balcony of City Hall looking at the thickly-set night sky. The star-density here in the Greater Magellanic was very high, even outside the clusters — at most the distances between stars were matters of light-months rather than light-years. Even should



it prove impossible to move the city itself again—which was inevitable, considering that the Sixtieth Street spindizzy had just followed the Twenty-third Street machine into the junk-pit—it should be possible to set interstellar commerce going here by cargo-ship. The city's remaining drivers, ripped out and remounted on a one-per-hull basis, would provide the nucleus of quite a respectable little fleet.

It would not be much like cruising among the far-scattered, various civilizations of the Milky Way had been, but it would be commerce of a sort, and commerce was the Okies' oxygen.

He looked down. The brilliant starlight showed that the blasted heath extended all the way to the horizon in the west; in the east it stopped about a kilo away and gave place to land regularly divided into tiny squares. Whether each of these minuscule fields represented an individual farm he could not tell, but he had his suspicions. The language the Proctors had used in giving the city permission to land had had decidedly feudal overtones.

While he watched, the black skeleton of some tall structure erected itself swiftly nearby, between the city and the eastern stretch of the heath. The geology team already had its derrick in place. The phone at the balcony's rim buzzed and Amalfi picked it up.

"Boss, we're going to drill now," the voice of Mark Hazleton, the city

manager, said. "Coming down?"

"Yes. What do the soundings show?"

"Nothing very hopeful, but we'll know for sure shortly. This does look like oil land, I must say."

"We've been fooled before," Amalfi grunted. "Start boring; I'll be right down."

He had barely hung up the phone when the burring roar of the molar drill violated the still summer night, echoing calamitously among the buildings of the city. It was almost certainly the first time any planet in the Greater Magellanic had heard the protest of collapsing molecules, though the technique had been a century out of date back in the Milky Way.

Amalfi was delayed by one demand and another all the way to the field, so that it was already dawn when he arrived. The test bore had been sunk and the drill was being pulled up again; the team had put up a second derrick, from the top of which Hazleton waved to him. Amalfi waved back and went up in the lift.

There was a strong, warm wind blowing at the top, which had completely tangled Hazleton's hair under the earphone clips. To Amalfi, who was bald, it could make no such difference, but after years of the city's precise air-conditioning it did obscure things to his emotions.

"Anything yet, Mark?"

"You're just in time. Here she comes."



The first derrick rocked as the long core sprang from the earth and slammed into its side girders. There was no answering black fountain. Amalfi leaned over the rail and watched the sampling crew rope in the cartridge and guide it back down to the ground. The winch rattled and choked off, its motor panting.

"No soap," Hazleton said disgustingly. "I knew we shouldn't have trusted the Proctors."

"There's oil under here somewhere all the same," Amalfi said. "We'll get it out. Let's go down."

On the ground, the senior geologist had split the cartridge and was telling his way down the boring with a mass-pencil. He shot Amalfi a quick reptilian glance as the mayor's blocky shadow fell across the table.

"No dome," he said succinctly.

Amalfi thought about it. Now that the city was permanently cut off from the home galaxy, no work that it could do for money would mean a great deal to it. What was needed first of all was oil, so that the city could eat. Work that would yield good returns in the local currency would have to come much later. Right now the city would have to work for payment in drilling permits.

At the first contact that had seemed to be easy enough. This planet's natives had never been able to get below the biggest and most obvious oil domes, so there should be plenty of oil left for the city. In turn, the city

could throw up enough low-grade molybdenum and tungsten as a by-product of drilling to satisfy the terms of the Proctors.

But if there was no oil to crack for food—

"Sink two more shafts," Amalfi said. "You've got an oil-bearing till down there, anyhow. We'll pressure jellied gasoline into it and split it. Ride along a Number Eleven gravel to hold the seam open. If there's no dome, we'll boil the oil out."

"Steak yesterday and steak tomorrow," Hazleton murmured. "But never steak today."

Amalfi swung upon the city manager, feeling the blood charging upward through his thick neck. "Do you think you'll get fed any other way?" he growled. "This planet is going to be home for us from now on. Would you rather take up farming, like the natives? I thought you outgrew *that* notion after the raid on Gort."

"That isn't what I meant," Hazleton said quietly. His heavily space-tanned face could not pale, but it blued a little under the taut, weathered bronze. "I know just as well as you do that we're here for good. It just seemed funny to me that settling down on a planet for good should begin just like any other job."

"I'm sorry," Amalfi said, mollified. "I shouldn't be so jumpy. Well, we don't know yet how well off we are. The natives never have mined this planet to anything like pay-dirt depth,

and they refine stuff by throwing it into a stew pot. If we can get past this food problem, we've still got a good chance of turning this whole Cloud into a tidy corporation."

He turned his back abruptly on the derricks and began to walk slowly eastward away from the city. "I feel like a walk," he said. "Like to come along, Mark?"

"A walk?" Hazleton looked puzzled. "Why—sure. O.K., boss."

For a while they trudged in silence over the heath. The going was rough; the soil was clayey, and heavily gullied, particularly deceptive in the early morning light. Very little seemed to grow on it: only an occasional bit of low, starved shrubbery, a patch of tough, nettlelike stalks, a few clinging weeds like crab grass.

"This doesn't strike me as good farming land," Hazleton said. "Not that I know a thing about it."

"There's better land farther out, as you saw from the city," Amalfi said. "But I agree about the heath. It's blasted land. I wouldn't even believe it was radiologically safe until I saw the instrument readings with my own eyes."

"A war?"

"Long ago, maybe. But I think geology did most of the damage. The land was let alone too long; the topsoil's all gone. It's odd, considering how intensively the rest of the planet seems to be farmed."

They half-slid into a deep arroyo and scrambled up the other side. "Boss, straighten me out on something," Hazleton said. "Why did we adopt this planet, even after we found that it had people of its own? We passed several others that would have done as well. Are we going to push the local population out? We're not too well set up for that, even if it were legal or just."

"Do you think there are Earth cops in the Greater Magellanic, Mark?"

"No," Hazleton said, "but there are Okies now, and if I wanted justice I'd go to Okies, not to cops. What's the answer, Amalfi?"

"We may have to do a little judicious pushing," Amalfi said, squinting ahead. The double suns were glaring directly in their faces. "It's all in knowing where to push, Mark. You heard the character some of the outlying planets gave this place, when we spoke to them on the way in."

"They hate the smell of it," Hazleton said, carefully removing a burr from his ankle. "It's my guess that the Proctors made some early expeditions unwelcome. Still—"

Amalfi topped a rise and held out one hand. The city manager fell silent almost automatically, and clambered up beside him.

The cultivated land began, only a few meters away. Watching them were two—creatures.

One, plainly, was a man; a naked man, the color of chocolate, with

matted blue-black hair. He was standing at the handle of a single-bladed plow, which looked to be made of the bones of some large animal. The furrow that he had been opening stretched behind him beside its fellows, and farther back in the field there was a low hut. The man was standing, shading his eyes, evidently looking across the dusky heath toward the Okie city. His shoulders were enormously broad and muscular, but bowed even when he stood erect, as now.

The figure leaning into the stiff leather straps which drew the plow also was human; a woman. Her head hung down, as did her arms, and her hair, as black as the man's but somewhat longer, fell forward and hid her face.

As Hazleton froze, the man lowered his head until he was looking directly at the Okies. His eyes were blue and unexpectedly piercing. "Are you the gods from the city?" he said:

Hazleton's lips moved. The serf could hear nothing; Hazleton was speaking into his throat-mike, audible only to the receiver imbedded in Amalfi's right mastoid bone.

"English, by the gods of all stars! The Proctors speak Interlingua. What's this, boss? Was the Cloud colonized *that* far back?"

Amalfi shook his head. "We're from the city," the mayor said aloud, in the same tongue. "What's your name, young fella?"

"Karst, lord."

"Don't call me 'lord.' I'm not one of your Proctors. Is this your land?"

"No, lord. Excuse . . . I have no other word—"

"My name is Amalfi."

"This is the Proctors' land, Amalfi. I work this land. Are you of Earth?"

Amalfi shot a swift sidelong glance at Hazleton. The city manager's face was expressionless.

"Yes," Amalfi said. "How did you know?"

"By the wonder," Karst said. "It is a great wonder, to raise a city in a single night. IMT itself took nine men of hands of thumbs of suns to build, the singers say. To raise a second city on the Barrens overnight—such a thing is beyond words."

He stepped away from the plow, walking with painful, hesitant steps, as if all his massive muscles hurt him. The woman raised her head from the traces and pulled the hair back from her face. The eyes that looked forth at the Okies were dull, but there were phosphorescent stirrings of alarm behind them. She reached out and grasped Karst by the elbow.

"It . . . is nothing," she said.

He shook her off. "You have built a city over one of night," he repeated. "You speak the Engh tongue, as we do on feast days. You speak to such as me, with words, not with the whips with the little tags. You have fine clothes, with patches of color of fine-woven cloth."

It was beyond doubt the longest speech he had ever made in his life. The clay on his forehead was beginning to streak with the effort.

"You are right," Amalfi said. "We are from Earth, though we left it long ago. I will tell you something else, Karst. You, too, are of Earth."

"That is not so," Karst said, retreating a step. "I was born here, and all my people. None claim Earth blood —"

"I understand," Amalfi said. "You are of this planet. But you are an Earthman. And I will tell you something else. I do not think the Proctors are Earthmen. I think they lost the right to call themselves Earthmen long ago, on another planet, a planet named Thor V."

Karst wiped his calloused palms against his thighs. "I want to understand," he said. "Teach me."

"Karst!" the woman said pleadingly. "It is nothing. Wonders pass. We are late with the planting."

"Teach me," Karst said doggedly. "All our lives we furrow the fields, and on the holidays they tell us of Earth. Now there is a marvel here, a city raised by the hands of Earthmen, there are Earthmen in it who speak to us—" He stopped. He seemed to have something in his throat.

"Go on," Amalfi said gently.

"Teach me. Now that Earth has built a city on the Barrens, the Proctors can not hold knowledge for their

own any longer. Even when you go, we will learn from your empty city, before it is ruin by wind and rain. Lord Amalfi, if we are Earthmen, teach us as Earthmen are taught."

"Karst," said the woman, "it is not for us. It is a magic of the Proctors. All magics are of the Proctors. They mean to take us from our children. They mean us to die on the Barrens. They tempt us."

The serf turned to her. There was something indefinably gentle in the motion of his brutalized, crackle-skinned, thick-muscled body.

"You need not go," he said, in a slurred Interlingua patois which was obviously his usual tongue. "Go on with the plowing, does it please you. But this is no thing of the Proctors. They would not stoop to tempt slaves as mean as we are. We have obeyed the laws, given our tithes, observed the holidays. This is of Earth."

The woman clenched her horny hands under her chin and shivered. "It is forbidden to speak of Earth except on holidays. But I will finish the plowing. Otherwise our children will die."

"Come, then," Amalfi said. "There is much to learn."

To his complete consternation, the serf went down on both knees. A second later, while Amalfi was still wondering what to do next, Karst was up again, and climbing up onto the Barrens toward them. Hazleton offered him a hand, and was nearly

hurled like a flat stone through the air when Karst took it; the serf was as solid and strong as a pile driver, and as sure on his stony feet.

"Karst, will you return before night?" the woman cried.

Karst did not answer. Amalfi began to lead the way back toward the city. Hazleton started down the far side of the rise after them, but something moved him to look back again at the little scrap of farm. The woman's head had fallen forward again, the wind stirring the tangled curtain of her hair. She was leaning heavily into the galling traces, and the plow was again beginning to cut its way painfully through the stony soil. There was now, of course, nobody to guide it.

"Boss," Hazleton said into the throat-mike, "are you listening?"

"I'm listening."

"I don't think I want to snatch a planet from these people."

Amalfi didn't answer; he knew well enough that there was no answer. The Okie city would never go aloft again. This planet was home. There was no place else to go.

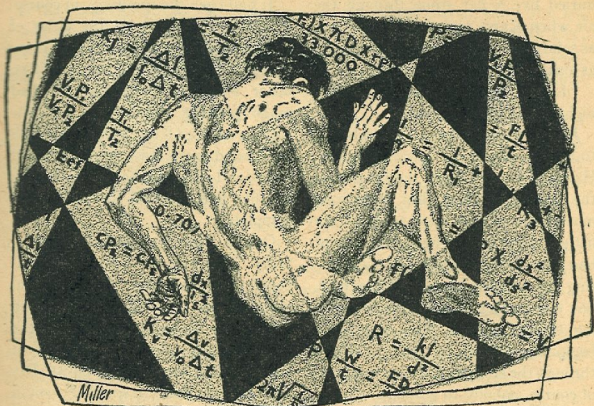
The voice of the woman, crooning as she plowed, dwindled behind them. Her song droned monotonously over unseen and starving children: a lullaby. Hazleton and Amalfi had fallen from the sky to rob her of everything but the stony and now unharvestable soil. It was Amalfi's hope to return her something far more valuable.

It had been the spindizzy, of course, which had scooped up the cities of Earth—and later, of many other planets—and hurled them into space. Two other social factors, however, had made possible the roving, nomadic culture of the Okies, a culture which had lasted more than three thousand years, and which probably would take another five hundred to disintegrate completely.

One of these was personal immortality. The conquest of so-called "natural" death had been virtually complete by the time the technicians on the Jovian Bridge had confirmed the spindizzy principle, and the two went together like hand in spacemitt. Despite the fact that the spindizzy would drive a ship—or a city—at speeds enormously faster than that of light, interstellar flight still consumed finite time. The vastness of the galaxy was sufficient to make long flights consume lifetimes even at top spindizzy speed.

But when death yielded to the anti-athapic drugs, there was no longer any such thing as a "lifetime" in the old sense.

The other factor was economic: the rise of the metal germanium as the jinni of electronics. Long before flight in deep space became a fact, the metal had assumed a fantastic value on Earth. The opening of the interstellar frontier drove its price down to a manageable level, and gradually it emerged as the basic, stable monetary standard of space trade. Coinage in conductor



metals, whose value had always been largely a matter of pressure politics, became extinct; it became impossible to maintain, for instance, the fiction that silver was precious, when it lay about in such flagrant profusion in the rocks of every newly-discovered Earthlike planet. The semiconductor germanium became the coin of the star-man's realm.

And after three thousand years, personal immortality and the germanium standard joined forces to destroy the Okies.

It had always been inevitable that the germanium standard would not last. The time was bound to come when the metal would be synthesized

cheaply, or a substance even more versatile would be found, or some temporary center of trade would corner a significant fraction of the money in circulation. It was not even necessary to predict specifically how the crisis would occur, to be able to predict what it would do to the economy of the galaxy. Had it happened a little earlier, before the economies of thousands of star-systems had become grounded in the standard, the effect probably would have been only temporary.

But when the germanium standard finally collapsed, it took with it the substrate in which the Okies had been imbedded. The semiconductor base

was relegated to the same limbo which had claimed the conductor-metal base. The most valuable nonconductors in the galaxy were the anti-athapic drugs; the next currency was based on a drug standard.

As a standard it was excellent, passing all the tests that a coinage is supposed to meet. The drugs could be indefinitely diluted for small change; they had never been synthesized, and any other form of counterfeiting could be detected easily by bio-assay and other simple tests; they were very rare; they were universally needed; their sources of supply were few enough in number to be readily monitored.

Unfortunately, the star-cruising Okies needed the drugs *as drugs*. They could not afford to use them as money.

From that moment on, the Okies were no longer the collective citizens of a nomadic culture. They were just interstellar bums. There was no place for them in the galaxy any more.

Outside the galaxy, of course, the Okie commerce lanes had never penetrated—

The city was old—unlike the men and women who manned it, who had merely lived a long time, which is quite a different thing. And like any old intelligence, its past sins lay very near the surface, ready for review either in nostalgia or in self-accusation at the slightest cue. It was difficult these days to get any kind of information out of the City Fathers without having to

submit to a lecture, couched in as high a moral tone as was possible to machines whose highest morality was survival.

Amalfi knew well enough what he was letting himself in for when he asked the City Fathers for a review of the Violations Docket. He got it, and in bells—big bells. The City Fathers gave him everything, right down to the day a dozen centuries ago when they had discovered that nobody had dusted the city's ancient subways since the city had first gone into space. That had been the first time the Okies had heard that the city had ever had any subways.

But Amalfi stuck to the job, though his right ear ached with the pressure of the earphone. Out of the welter of minor complaints and wistful recollections of missed opportunities, certain things came through clearly and urgently.

The city had never been officially cleared of its failure to observe the "Vacate" order the cops had served on it during the reduction of Utopia. Later, during the same affair, the city had been hung with a charge of technical treason—not as serious as it sounded, but subject to inconvenient penalties—while on the neighboring planet of Hrunta, and had left the scene with the charge still on the docket. There had been a small trick pulled there, too, which the cops could hardly have forgotten: while it had not been illegal, it had created laughter at

the expense of the cops in every Okie wardroom in the galaxy, and cops seldom like to be laughed at.

Then there was the moving of He. The city had fulfilled its contract with that planet to the letter, but unfortunately that could never be proven; He was now well on its way across the intergalactic gap toward Andromeda, and could not testify on the city's behalf. As far as the cops knew, the city had destroyed He, a notion the cops would be no less likely to accept simply because it was ridiculous.

Worst of all, however, was the city's participation in the March on Earth. The March had been a tragedy from beginning to end, and few of the several hundred Okie cities which had taken part in it had survived it. It had been a product of the galaxy-wide depression which had followed the collapse of the germanium standard. Amalfi's city—already accused of several crimes in the star-system where the March had started, crimes which as a matter of fact the city had actually been forced to commit—had gone along because it had had no better choice, and had done what it could to change the March from a mutual massacre to a collective bargaining session; but the massacre had occurred all the same. No one city, not even Amalfi's, could have made its voice heard above the long roar of galactic collapse.

There was the redeeming fact that the city, during the March, had found

and extirpated one of the last residues of the Vegan tyranny. But it could never be proven: like the affair on He, the city had done so thorough a job that even the evidence was gone irrevocably.

Amalfi sighed. In the end, it appeared that the Earth cops would remember Amalfi's city for two things only. *One*: The city had a long Violations Docket, and still existed to be brought to book on it. *Two*: The city had gone out toward the Greater Magellanic, just as a far older and blacker city had done centuries before—the city which had perpetrated the massacre on Thor V, the city whose memory still stank in the nostrils of cops and surviving Okies alike.

Amalfi shut off the City Fathers in mid-remembrance and removed the phone from his aching ear. The control boards of the city stretched before him, still largely useful, but dead forever in one crucial bloc—the bank that had once flown the city from star to new star. The city was grounded; it had no choice now but to accept, and then win, this one poor planet for its own.

*If the cops would let it.* The Magellanic Clouds were moving steadily and with increasing velocity away from the home galaxy; the gap was already so large that the city had had to cross it by using a dirigible planet as a booster-stage. It would take the cops time to decide that they should make that enormously long flight in pursuit



of one miserable Okie. But in the end they would make that decision. The cleaner the home galaxy became of Okies—and there was no doubt but that the cops had by now broken up the majority of the space-faring cities—the greater the urge would become to track down the last few stragglers.

Amalfi had no faith in the ability of a satellite starcloud to outrun human technology. By the time the cops were ready to cross from the home lens to the Greater Magellanic, they would have the techniques with which to do it, and techniques far less clumsy than those Amalfi's city had used. If the cops wanted to chase the Greater Magellanic, they would find ways to catch it. If—

Amalfi took up the earphone again. "Question," he said. "Will the need to catch us be urgent enough to produce the necessary techniques in time?"

The City Fathers hummed, drawn momentarily from their eternal mulling over the past. At last they said:

**"YES, MAYOR AMALFI. BEAR IN MIND THAT WE ARE NOT ALONE IN THIS CLOUD. REMEMBER THOR V."**

There it was: the ancient slogan that had made Okies hated even on planets that had never seen an Okie city, and could never expect to. There was only the smallest chance that the city which had wrought the Thor V atrocity had made good its escape to this Cloud; it had all happened a long time ago.

But even the narrow chance, if the City Fathers were right, would bring the cops here sooner or later, to destroy Amalfi's own city in expiation of that still-burning crime.

*Remember Thor V.* No city would be safe until that raped and murdered world could be forgotten. Not even out here, in the virgin satellites of the home lens.

"Boss? Sorry, we didn't know you were busy. But we've got an operating schedule set up, as soon as you're ready to look at it."

"I'm ready right now, Mark," Amalfi said, turning away from the boards. "Hello, Dee. How do you like your planet?"

The former Utopian girl smiled. "It's beautiful," she said simply.

"For the most part, anyway," Hazleton agreed. "This heath is an ugly place, but the rest of the land seems to be excellent—much better than you'd think it from the way it's being farmed. The tiny little fields they break it up into here just don't do it justice, and even I know better cultivation methods than these serfs do."

"I'm not surprised," Amalfi said. "It's my theory that the Proctors maintain their power partly by preventing the spread of any knowledge about farming beyond the most rudimentary kind. That's also the most rudimentary kind of politics, as I don't need to tell you."

"On the politics," Hazleton said

evenly, "we're in disagreement. While that's ironing itself out, the business of running the city has to go on."

"All right," Amalfi said. "What's on the docket?"

"I'm having a small plot on the heath, next to the city, turned over and conditioned for some experimental plantings, and extensive soil tests have already been made. That's purely a stopgap, of course. Eventually we'll have to expand onto good land. I've drawn up a tentative contract of lease between the city and the Proctors, which provides for us to rotate ownership geographically so as to keep displacement of the serfs at a minimum, and at the same time opens a complete spectrum of seasonal plantings to us—essentially it's the old Limited Colony contract, but heavily weighted in the direction of the Proctors' prejudices. There's no doubt in my mind but that they'll sign it. Then—"

"They won't sign it," Amalfi said. "They can't even be shown it. Furthermore, I want everything you've put into your experimental plot here on the heath yanked out."

Hazleton put a hand to his forehead in frank exasperation. "Boss," he said, "don't tell me that we're *still* not at the end of the old squirrel-cage routine—intrigue, intrigue, and then more intrigue. I'm sick of it, I'll tell you that directly. Isn't two thousand years enough for you? I thought we had come to this planet to settle down!"

"We did. We will. But as you reminded me yourself yesterday, there are other people in possession of this planet at the moment—people we can't legally push out. As matters stand right now, we can't give them the faintest sign that we mean to settle here; they're already intensely suspicious of that very thing, and they're watching us for evidence of it every minute."

"Oh, no," Dee said. She came forward swiftly and put a hand on Amalfi's shoulder. "John, you promised us after the March was over that we were going to make a home here. Not necessarily on this planet, but somewhere in the Cloud. You promised, John."

The mayor looked up at her. It was no secret to her, or to Hazleton either, that he loved her; they both knew, as well, the cruelly just Okie law that forbade the mayor of an Okie city any permanent alliance with a woman—and the vein of iron loyalty in Amalfi that would have compelled him to act by that law even had it never existed. Until the sudden crisis far back in the Acolyte cluster which had forced Amalfi to reveal to Hazleton the existence of that love, neither of the two youngsters had suspected it over a period of nearly nine decades.

But Dee was comparatively new to Okie mores, and was in addition a woman. Only to know that she was loved had been unable to content her long. She was already beginning to put the knowledge to work.

"Of course I promised," Amalfi said. "I've delivered on my promises for nearly two thousand years, and I'll continue to do so. The blunt fact is that the City Fathers would have me shot if I didn't—as they nearly had Mark shot on more than one occasion. This planet will be our home, if you'll give me just the minimum of help in winning it. It's the best of all the planets we passed on the way in, for a great many reasons—including a couple that won't begin to show until you see the winter constellations here, plus a few more that won't become evident for a century yet. But there's one thing I certainly can't give you, and that's immediate delivery."

"All right," Dee said. She smiled. "I trust you, John, you know that. But it's hard to be patient."

"Is it?" Amalfi said, surprised. "Come to think of it, I remember once during the tipping of He when the same thought occurred to me. In retrospect the problem doesn't seem large."

"Boss, you'd better give us some substitute courses of action," the city manager's voice cut in, a little coldly. "With the possible exception of yourself, every man and woman and alley cat in the city is ready to spread out all over the surface of this planet the moment the starting gun is fired. You've given us every reason to think that that would be the way it would happen. If there's going to be a delay, you have a good many idle hands to

put to work."

"Use straight work-contract procedure, all the way down the line," Amalfi said. "No exploiting of the planet that we wouldn't normally do during the usual stopover for a job. That means no truck-gardens or any other form of local agriculture; just refilling the oil tanks, re-breeding the *Chlorella* strains from local sources for heterosis, and so on."

"That won't work," Hazleton said. "It may fool the Proctors, Amalfi, but how can you fool our own people? What are you going to do with the perimeter police, for instance? Sergeant Paterson's whole crew knows that it won't ever again have to make up a boarding squad or defend the city or take up any other military duty. Nine tenths of them are itching to throw off their harness for good and start dirt-farming. What am I to do with them?"

"Send 'em out to your experimental potato patch on the heath," Amalfi said. "On police detail. Tell 'em to pick up everything that grows."

Hazleton started to turn toward the lift-shaft, holding out his hand to Dee. Then he turned back.

"But why, boss?" he said plaintively. "What makes you think that the Proctors suspect us of squatting? And what could they do about it if they did?"

"The Proctors have asked for the standard work-contract," Amalfi said. "They know what it is, and they insist

upon its observation, to the letter, *including* the provision that the city must be off this planet by the date of termination. As you know, that's impossible; we can't leave this planet, either inside or outside the contract period. But we'll have to pretend that we're going to leave, up to the last possible minute."

Hazleton looked stunned. Dee took his hand reassuringly, but it didn't seem to register.

"As for what the Proctors themselves can do about it," Amalfi said, picking up the earphone again, "I don't yet know. I'm trying to find out. But this much I do know:

"The Proctors have *already* called the cops."

## II.

Under the gray, hazy light in the schoolroom, voices and visions came thronging even into the conscious and prepared mind of the visitor, pouring from the memory cells of the City Fathers. Amalfi could feel their pressure, just below the surface of his mind; it was vaguely unpleasant, partly because he already knew what they sought to impart, so that the redoubled impressions tended to shoulder forward into the immediate attention, nearly with the vividness of immediate experience.

Superimposed upon the indefinite outlines of the schoolroom, cities soared across Amalfi's vision, cities

aloft, in flight, looking for work, cracking their food from oil, burrowing for ores the colonial planets could not reach without help, and leaving again to search for work; sometimes welcomed grudgingly, sometimes driven out, usually underpaid, often potential brigands, always watched jealously by the police of hegemon Earth; spreading, ready to mow any lawn, toward the limits of the galaxy—

He waved a hand annoyedly before his eyes and looked for a monitor, found one standing at his elbow, and wondered how long he had been there—or, conversely, how long Amalfi himself had been lulled into the learning trance.

"Where's Karst?" he said brusquely. "The first serf we brought in? I need him."

"Yes, sir. He's in a chair toward the front of the room." The monitor—whose function combined the duties of classroom supervisor and nurse—turned away briefly to a nearby wall server, which opened and floated out to him a tall metal tumbler. The monitor took it and led the way through the room, threading his way among the scattered couches. Usually most of these were unoccupied, since it took less than five hundred hours to bring the average child through tensor calculus and hence to the limits of what he could be taught by passive inculcation alone. Now, however, every couch was occupied, and few of them by children.

One of the counterpointing, sub-audible voices was murmuring: "Some of the cities which turned bindlestiff did not pursue the usual policy of piracy and raiding, but settled instead upon faraway worlds and established tyrannical rules. Most of these were overthrown by the Earth police; the cities were not efficient fighting machines. Those which withstood the first assault sometimes were allowed to remain in power for various reasons of policy, but such planets were invariably barred from commerce. Some of these involuntary empires may still remain on the fringes of Earth's jurisdiction. Most notorious of these recrudescences of imperialism was the reduction of Thor V, the work of one of the earliest of the Okies, a heavily militarized city which had already earned itself the popular nickname of 'the Mad Dogs.' The epithet, current among other Okies as well as planetary populations, of course referred primarily—"

"Here's your man," the monitor said in a low voice. Amalfi looked down at Karst. The serf already had undergone a considerable change. He was no longer a distorted and worn caricature of a man, chocolate-colored with sun, wind and ground-in dirt, so brutalized as to be almost beyond pity. He was, instead, rather like a foetus as he lay curled on the couch, innocent and still perfectable, as yet unmarked by any experience which counted. His past—and there could hardly have been

much of it, for although he had said that his present wife, Eedit, had been his fifth, he was obviously scarcely twenty years old—had been so completely monotonous and implacable that, given the chance, he had sloughed it off as easily and totally as one throws away a single garment. He was, Amalfi realized, much more essentially a child than any Okie infant could ever be.

The monitor touched Karst's shoulder and the serf stirred uneasily, then sat up, instantly awake, his intense blue eyes questioning Amalfi. The monitor handed him the metal tumbler, now beaded with cold, and Karst drank from it. The pungent liquid made him sneeze, quickly and without seeming to notice that he had sneezed, like a cat.

"How's it coming through, Karst?" Amalfi said.

"It is very hard," the serf said. He took another pull at the tumbler. "But once grasped, it seems to bring everything into flower at once. Lord Amalfi, the Proctors claim that IMT came from the sky on a cloud. Yesterday I only believed that. Today I think I understand it."

"I think you do," Amalfi said. "And you're not alone. We have serfs by scores in the city now, learning—just look around you and you'll see. And they're learning more than just simple physics or cultural morphology. They're learning freedom, beginning with the first one—freedom to hate."

"I know that lesson," Karst said, with a profound and glacial calm. "But you awakened me for something."

"I did," the mayor agreed grimly. "We've got a visitor we think you'll be able to identify: a Proctor. And he's up to something that smells funny to me and Hazleton both, but we can't pin down what it is. Come give us a hand, will you?"

"You'd better give him some time to rest, Mr. Mayor," the monitor said disapprovingly. "Being dumped out of hypnopaedic trance is a considerable shock; he'll need at least an hour."

Amalfi stared at the monitor incredulously. He was about to note that neither Karst nor the city had the hour to spare, when it occurred to him that to say so would take ten words where one was plenty. "Vanish," he said.

The monitor did his best.

Karst looked intently at the judas. The man on the screen had his back turned; he was looking into the big operations tank in the city manager's office. The indirect light gleamed on his shaven and oiled head. Amalfi watched over Karst's left shoulder, his teeth sunk firmly in a new hydroponic cigar.

"Why, the man's as bald as I am," the mayor said. "And he can't be much past his adolescence, judging by his skull; he's forty-five at the most. Recognize him, Karst?"

"Not yet," Karst said. "All the Proctors shave their heads. If he would only turn around . . . ah. Yes. That's Heldon. I have seen him myself only once, but he is easy to recognize. He is young, as the Proctors go. He is the stormy petrel of the Great Nine—some think him a friend of the serfs. At least he is less quick with the whip than the others."

"What would he be wanting here?"

"Perhaps he will tell us." Karst's eyes remained fixed upon the Proctor's image.

"Your request puzzles me," Hazleton's voice said, issuing smoothly from the speaker above the judas. The city manager could not be seen, but his expression seemed to modulate the sound of his voice almost specifically: the tiger mind masked behind a pussy-cat purr as behind a pussy-cat smile. "We're glad to hear of new services we can render to a client, of course. But we certainly never suspected that antigravity mechanisms even existed in IMT."

"Don't think me stupid, Mr. Hazleton," Heldon said. "You and I know that IMT was once a wanderer, as your city is now. We also know that your city, like all Okie cities, would like a world of its own. Will you allow me this much intelligence, please?"

"For discussion, yes," Hazleton's voice said.

"Then let me say that it's quite evident to me that you're nurturing an uprising. You have been careful to

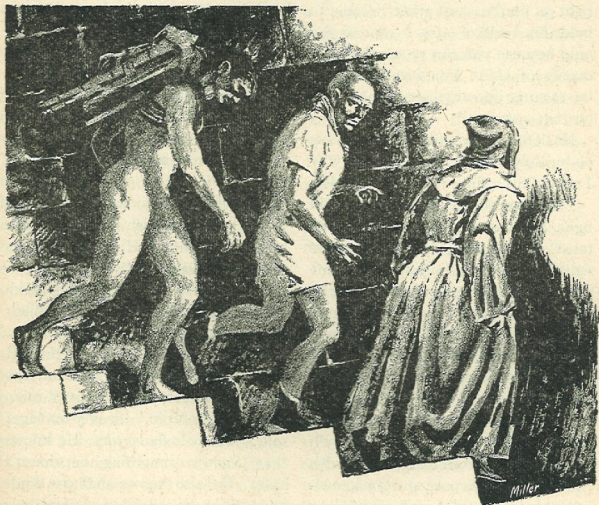
stay within the letter of the contract, simply because you dare not breach it, any more than we; the Earth police protect us from each other to that extent. Your Mayor Amalfi was told that it was illegal for the serfs to speak to your people, but unfortunately it is illegal only for the serfs, not for your citizens. If we cannot keep the serfs out of your city, you are under no obligation to do it for us."

"A point you have saved me the trouble of making," Hazleton said.

"Quite so. I'll add also that when

this revolution of yours comes, I have no doubt but that you'll win it. I don't know what weapons you can put into the hands of our serfs, but I assume that they are better than anything we can muster. We haven't your technology. My fellows disagree with me, but I am a realist."

"An interesting theory," Hazleton's voice said. There was a brief pause. In the silence, a soft pattering sound became evident. Hazleton's fingertips, Amalfi guessed, drumming on the desk top, as if with amused impatience.



Heldon's face remained impassive.

"The Proctors believe that they can hold what is theirs," Heldon said at last. "If you overstay your contract, they will go to war against you. They will be justified, but unfortunately Earth justice is a long way away from here. You will win. My interest is to see that we have a way of escape."

"Via spindizzy?"

"Precisely." Heldon permitted a stony smile to stir the corners of his mouth. "I'll be honest with you, Mr. Hazleton. If it comes to war, I will fight as hard as any other Proctor to hold this world of ours. I come to you only because you can repair the spindizzies of IMT. You needn't expect me to enter into any extensive treason on that account."

Hazleton, it appeared, was being obdurately stupid. "I fail to see why I should lift a finger for you," he said.

"Observe, please. The Proctors will fight, because they believe that they must. It will probably be a hopeless fight, but it will do your city some damage all the same. As a matter of fact, it will cripple your city beyond repair, unless your luck is phenomenal. Now then: none of the Proctors except one other man and myself know that the spindizzies of IMT are still able to function. That means that they won't try to escape with them; they'll try to knock you out instead. But with the machines in repair, and one knowledgeable hand at the controls—"

"I see," Hazelton said. You propose to put IMT into flight while you can still get off the planet with a reasonably whole city. In return you offer us the planet, and the chance that our own damages will be minimal. Hm-m-m. It's interesting, anyhow. Suppose we take a look at your spindizzies, and see if they're in operable condition. It's been a good many years, without doubt, and untended machinery has a way of gumming up. If they can still be operated at all, we'll talk about a deal. All right?"

"It will have to do," Heldon grumbled. Amalfi saw in the Proctor's eyes a gleam of cold satisfaction which he recognized at once, from having himself looked out through it often—though never in such a poor state of concealment. He shut off the screen.

"Well?" the mayor said. "What's he up to?"

"Trouble," Karst said slowly. "It would be very foolish to give or trade him any advantage. His stated reasons are not his real ones."

"Of course not," Amalfi said. "Whose are? Oh, hello, Mark. What do you make of our friend?"

Hazleton stepped out of the lift shaft, bouncing lightly once on the resilient concrete of the control-room floor. "He's stupid," the city manager said, "but he's dangerous. He knows that there's something he doesn't know. He also knows that we don't know what he's driving at, and he's



on his home grounds. It's a combination I don't care for."

"I don't like it myself," Amalfi said. "When the enemy starts giving away information, look out! Do you think the majority of the Proctors really don't know that IMT has operable spindizzies?"

"I am sure they do not," Karst offered tentatively. Both men turned to him. "The Proctors do not even believe that you are here to capture the planet. At least, they do not believe that that is what you intend, and I'm sure they don't care, one way or the other."

"Why not?" Hazleton said. "I would."

"You have never *owned* several million serfs," Karst said, without rancor. "You have serfs working for you, and you are paying them wages. That in itself is a disaster for the Proctors. And they cannot stop it. They know that the money you are paying is legal, with the power of the Earth behind it. They cannot stop us from earning it. To do so would cause an uprising at once."

Amalfi looked at Hazleton. The money the city was handing out was the Oc Dollar. It was legal here—but back in the galaxy it was just so much paper. It was only germanium-backed. Could the Proctors be that naïve? Or was IMT simply too old to possess the instantaneous Dirac transmitters which would have told it of the economic collapse of the home lens?

"And the spindizzies?" Amalfi said. "Who else would know of them among the Great Nine?"

"Asor, for one," Karst said. "He is the presiding officer, and the religious fanatic of the group. It is said that he still practices daily the full thirty yogas of the Semantic Rigor, even to chinning himself upon every rung of the Abstraction Ladder. The prophet Maalvin banned the flight of men forever, so Asor would not be likely to allow IMT to fly at this late date."

"He has his reasons," Hazleton said reflectively. "Religions rarely exist in a vacuum. They have effects on the societies they reflect. He's probably afraid of the spindizzies, in the last analysis. With such a weapon it takes only a few hundred men to make a revolution—more than enough to overthrow a feudal set-up like this. IMT didn't dare keep its spindizzies working."

"Go on, Karst," Amalfi said, raising his hand impatiently at Hazleton. "How about the other Proctors?"

"There is Bemajdi, but he hardly counts," Karst said. "Let me think. Remember I have never seen most of these men. The only one who matters, it seems to me, is Larre. He is a dour-faced old man with a potbelly. He is usually on Heldon's side, but seldom travels with Heldon all the way. He will worry less about the money the serfs are earning than will the rest. He will contrive a way to tax it away from us—perhaps by declaring a holi-

day, in honor of the visit of Earthmen to our planet. The collection of tithes is a duty of his."

"Would he allow Heldon to put IMT's spindizzies in shape?"

"No, probably not," Karst said. "I believe Heldon was telling the truth when he said that he would have to do that in secret."

"I don't know," Amalfi said. "I don't like it. On the surface, it looks as though the Proctors hope to scare us off the planet as soon as the contract expires, and then collect all the money we've paid the serfs—with the cops to back them up. But when you look closely at it, it's crazy. Once the cops find out the identity of IMT—and it won't take them long—they'll break up both cities, and be glad of the chance."

Karst said: "Is this because IMT was the Okie city that did . . . what was done . . . on Thor V?"

Amalfi suddenly found that he was having difficulty in keeping his Adam's apple where it belonged. "Let that pass, Karst," he growled. "We're not going to import that story into the Cloud. That should have been cut from your learning tape."

"I know it now," Karst said calmly. "And I am not surprised. The Proctors never change."

"Forget it. Forget it, do you hear? Forget everything. Karst, can you go back to being a dumb serf for a night?"

"Go back to my land?" Karst said.

"It would be awkward. My wife must have a new man by now—"

"No, not back to your land. I want to go with Heldon and look at his spindizzies, as soon as he says the word. I'll need to take some heavy equipment, and I'll need some help. Will you come along?"

Hazleton raised his eyebrows. "You won't fool Heldon, boss."

"I think I will. Of course he knows that we've educated some of the serfs, but that's not a thing he can actually see when he looks at it; his whole background is against it. He just isn't accustomed to thinking of serfs as intelligent. He knows we have thousands of them here, and yet he isn't really afraid of that idea. He thinks we may arm them, make a mob of them. He can't begin to imagine that a serf can learn something better than how to handle a sidearm—something better, and far more dangerous."

"How can you be sure?" Hazleton said.

"By analogue. Remember the planet of Thetis Alpha called Fitzgerald, where they used a big beast called a horse for everything—from pulling carts to racing? All right: suppose you visited a place where you had been told that a few horses had been taught to talk. While you're working there, somebody comes to give you a hand, dragging a spavined old plug with a straw hat pulled down over its ears and a pack on its back. (Excuse me, Karst, but business is business.)

You aren't going to think of that horse as one of the talking ones. You aren't accustomed to thinking of horses as being able to talk at all."

"All right," Hazleton said, grinning at Karst's evident discomfiture. "What's the main strategy from here on out, boss? I gather that you've got it set up. Are you ready to give it a name yet?"

"Not quite," the mayor said. "Unless you like long titles. It's still just another problem in political pseudo-morphism."

Amalfi caught sight of Karst's deliberately incurious face and his own grin broadened. "Or," he said, "the fine art of tricking your opponent into throwing his head at you."

### III.

IMT was a squat city, long rooted in the stony soil, and as changeless as a forest of cenotaphs. Its quietness, too, was like the quietness of a cemetery, and the Proctors, carrying the fanlike wands of their office, the pierced fans with the jagged tops and the little jingling tags, were much like friars moving among the dead.

The quiet, of course, could be accounted for very simply. The serfs were not allowed to speak within the walls of IMT unless spoken to, and there were comparatively few Proctors in the city to speak to them. For Amalfi there was also the imposed silence of the slaughtered millions of

Thor V blanketing the air. He wondered if the Proctors could still hear that raw silence.

The naked brown figure of a passing serf glanced furtively at the party, saw Heldon, and raised a finger to its lips in the established gesture of respect. Heldon barely nodded. Amalfi, necessarily, took no overt notice at all, but he thought: *Shh, is it? I don't wonder. But it's too late, Heldon. The secret is out.*

Karst trudged behind them, shooting an occasional wary glance at Heldon from under his tangled eyebrows. His caution was wasted on the Proctor. They passed through a decaying public square, in the center of which was an almost-obliterated statuary group, so weather-worn as to have lost any integrity it might ever have had; integrity, Amalfi mused, is not a characteristic of monuments. Except to a sharp eye, the mass of stone on the old pedestal might have been nothing but a moderately large meteorite, riddled with the twisting pits characteristic of siderites.

Amalfi could see, however, that the spaces sculpted out of the interior of that block of stone, after the fashion of an ancient sculptor named Moore, had once had meaning. Inside that stone there had once stood a powerful human figure, with its foot resting upon the neck of a slier. Once, evidently, IMT had actually been *proud* of the memory of Thor V—

"Ahead is the Temple," Heldon

said suddenly. "The machinery is beneath it. There should be no one of interest in it at this hour, but I had best make sure. Wait here."

"Suppose somebody notices us?" Amalfi said.

"This square is usually avoided. Also, I have men posted around it to divert any chance traffic. If you don't wander away, you'll be safe."

The Proctor strode away toward the big domed building and disappeared abruptly down an alleyway. Behind Amalfi, Karst began to sing, in an exceedingly scratchy voice, but very softly: a folk-tune of some kind, obviously. The melody, which once had had to do with a town named Kazan, was too many thousands of years old for Amalfi to recognize it, even had he not been tune-deaf. Nevertheless, the mayor abruptly found himself listening to Karst, with the intensity of a hooded owl sonar-tracking a field mouse. Karst chanted:

*"Wild on the wind rose the righteous  
wrath of Maalvin,*

*Borne like a brand to the burning of  
the Barrens.*

*Arms of hands of rebels perished then,  
Stars nor moons bedecked that mid-  
night,*

*IMT made the sky  
Fall!"*

Seeing that Amalfi was listening to him, Karst stopped with an apologetic gesture. "Go ahead, Karst," Amalfi said at once. "How does the rest go?"

"There isn't time. There are hun-

dreds of verses; every singer adds at least one of his own to the song. It is always supposed to end with this one:

*"Black with their blood was the brick  
of that barrow,*

*Topped the tall towers, crushed to the  
clay.*

*None might live who flouted Maalvin,  
Earth their souls spurned spaceward,  
wailing,*

*IMT made the sky  
Fall!"*

"That's great," Amalfi said grimly. "We really are in the soup—just about in the bottom of the bowl, I'd say. I wish I'd heard that song a week ago."

"What does it tell you?" Karst said, wonderingly. "It is only an old legend."

"It tells me why Heldon wants his spindizzies fixed. I knew he wasn't telling me the straight goods, but that old Laputa gag never occurred to me—more recent cities aren't strong enough in the keel to risk it. But with all the mass this burg packs, it can squash us flat—and we'll just have to sit still for it!"

"I don't understand—"

"It's simple enough. Your prophet Maalvin used IMT like a nutcracker. He picked it up, flew it over the opposition, and let it down again. The trick was dreamed up away before spaceflight, as I recall. Karst, stick close to me; I may have to get a message to you under Heldon's eye, so watch for—*Sst*, here he comes."

The Proctor had been uttered by the alleyway like an untranslatable word. He came rapidly toward them across the crumbling flagstones.

"I think," Heldon said, "that we are now ready for your valuable aid, Mayor Amalfi."

Heldon put his foot on a jutting pyramidal stone and pressed down. Amalfi watched carefully, but nothing happened. He swept his flash around the featureless stone walls of the underground chamber, then back again to the floor. Impatiently, Heldon kicked the little pyramid.

This time, there was a protesting rumble. Very slowly, and with a great deal of scraping, a block of stone perhaps five feet long by two feet wide began to rise, as if pivoted or hinged at the far end. The beam of the mayor's flash darted into the opening, picking out a narrow flight of steps.

"I'm disappointed," Amalfi said. "I expected to see Jonathan Swift come out from under it. All right, Heldon, lead on."

The Proctor went cautiously down the steps, holding his skirts up against the dampness. Karst came last, bent low under the heavy pack, his arms hanging laxly. The steps felt cold and slimy through the thin soles of the mayor's sandals, and little trickles of moisture ran down the close-pressing walls. Amalfi felt nearly intolerable urge to light a cigar; he could almost

taste the powerful aromatic odor cutting through the humidity. But he needed his hands free.

He was almost ready to hope that the spindizzies had been ruined by all this moisture, but he discarded the idea even as it was forming in the back of his mind. That would be the easy way out, and in the end it would be disastrous. If the Okies were ever to call this planet their own, IMT had to be made to fly again.

How to keep it off his own city's back, once IMT was aloft, he still was unable to figure. He was piloting, as he invariably wound up doing in the pinches, by the seat of his pants.

The steps ended abruptly in a small chamber, so small, chilly and damp that it was little more than a cave. The flashlight's eye roved, came to rest on an oval doorway sealed off with dull metal—almost certainly lead. So IMT's spindizzies ran "hot"? That was already bad news; it backdated them far beyond the year to which Amalfi had tentatively assigned them.

"That it?" he said.

"That is the way," Heldon agreed. He twisted an inconspicuous handle.

Ancient fluorescents flickered into bluish life as the valve drew back, and glinted upon the humped backs of machines. The air was quite dry here—evidently the big chamber was kept sealed—and Amalfi could not repress a fugitive pang of disappointment. He scanned the huge machines, looking

for control panels or homologues thereof.

"Well?" Heldon said harshly. He seemed to be under considerable strain. It occurred to Amalfi that Heldon's strategy might well be a personal flier, not an official policy of the Great Nine; in which case it might go hard with Heldon if his colleagues found him in this particular place of all places with an Okie. "Aren't you going to make any tests?"

"Certainly," Amalfi said. "I was a little taken aback at their size, that's all."

"They are old, as you know," said the Proctor. "Doubtless they are built much larger nowadays."

That, of course, wasn't so. Modern spindizzies ran less than a tenth the size of these. The comment cast new doubt upon Heldon's exact status. Amalfi had assumed that the Proctor would not let him touch the spindizzies except to inspect; that there would be plenty of men in IMT capable of making repairs from detailed instructions; that Heldon himself, and any Proctor, would know enough physics to comprehend whatever explanations Amalfi might proffer. Now he was not so sure—and on this question hung the amount of tinkering Amalfi would be able to do without being detected.

The mayor mounted a metal stair to a catwalk which ran along the tops of the generators, then stopped and

looked down at Karst. "Well, stupid, don't just stand there," he said. "Come on up, and bring the stuff."

Obediently Karst shambled up the metal steps, Heldon at his heels. Amalfi ignored them to search for an inspection port in the casing, found one, and opened it. Beneath was what appeared to be a massive rectifying circuit, plus the amplifier for some kind of monitor—probably a digital computer. The amplifier involved more vacuum tubes than Amalfi had ever before seen gathered into one circuit, and there was a separate power supply to deliver D.C. to their heaters. Two of the tubes were each as big as his fist.

Karst bent over and slung the pack to the deck. Amalfi drew out of it a length of slender black cable and thrust its double prongs into a nearby socket. A tiny bulb on the other end glowed neon-red.

"Your computer's still running," he reported. "Whether it's still sane or not is another matter. May I turn the main banks on, Heldon?"

"I'll turn them on," the Proctor said. He went down the stairs again and across the chamber.

Instantly Amalfi was murmuring through motionless lips into the inspection port. The result to Karst's ears must have been rather weird. The technique of speaking without moving one's lips is simply a matter of substituting consonants which do not involve lip movement, such as

"y," for those which do, such as "w." If the resulting sound is picked up from inside the resonating chamber, as it is with a throat-mike, it is not too different from ordinary speech, only a bit more blurred. Heard from outside the speaker's nasopharyngeal cavity, however, it has a tendency to sound like Japanese Pidgin.

"Yatch Heldon, Karst. See yich syitch he kulls, an' nenorize its location. Got it? Good."

The tubes lit. Karst nodded once, very slightly. The Proctor watched from below while Amalfi inspected the lines.

"Will they work?" he called. His voice was muffled, as though he were afraid to raise it as high as he thought necessary.

"I think so. One of these tubes is gassing, and there may have been some failures here and there. Better check the whole lot before you try anything ambitious. You do have facilities for testing tubes, don't you?"

Relief spread visibly over Heldon's face, despite his obvious effort to betray nothing. Probably he could have fooled any of his own people without effort, but for Amalfi, who like any Okie mayor could follow the parataxic "speech" of muscle interplay and posture as readily as he could spoken dialogue, Heldon's expression was as clear as a signed confession.

"Certainly," the Proctor said. "Is that all?"

"By no means. I think you ought to

rip out about half of these circuits, and install transistors wherever they can be used; we can sell you the necessary germanium at the legal rate. You've got two or three hundred tubes to a unit here, by my estimate, and if you have a tube failure in flight . . . well, the only word that fits what would happen then is *blooey!*"

"Will you be able to show us how?"

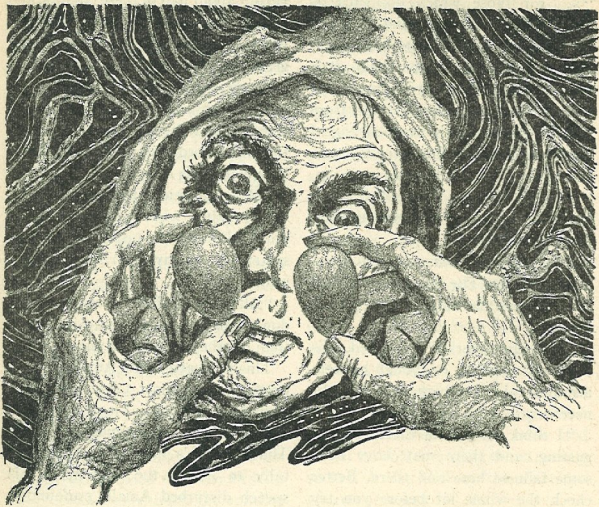
"Probably," the mayor said. "If you'll allow me to inspect the whole system, I can give you an exact answer."

"All right," Heldon said. "But don't delay. I can't count on more than another half-day at most."

This was better than Amalfi had expected—miles better. Given that much time, he could trace at least enough of the leads to locate the master control. That Heldon's expression failed totally to match the content of his speech disturbed Amalfi profoundly, but there was nothing that he could do that would alter that now. He pulled paper and stylus out of Karst's pack and began to make rapid sketches of the wiring before him.

After he had a fairly clear idea of the first generator's set-up, it was easier to block in the main features of the second. It took time, but Heldon did not seem to tire.

The third spindizzy completed the picture, leaving Amalfi wondering what the fourth one was for. It turned out to be a booster, designed to compensate for the losses of the others



wherever the main curve of their output failed to conform to the specs laid down for it by the crude, over-all regenerative circuit. The booster was located on the backside of the feedback loop, behind the computer rather than ahead of it, so that all the computer's corrections had to pass through it; the result, Amalfi was sure, would be a small but serious "base surge" every time any correction was applied. The spindizzies of IMT seemed to have been wired together by Cro-Magnon Man.

But they would fly the city. That was what counted.

Amalfi finished his examination of the booster generator and straightened up, painfully, stretching the muscles of his back. He had no idea how many hours he had consumed. It seemed as though months had passed. Heldon was still watching him, deep blue circles under his eyes, but still wide awake and watchful.

And Amalfi had found no point anywhere in the underground chamber



from which the spindizzies of IMT could be controlled. The control point was somewhere else; the main control cable ran into a pipe which shot straight up through the top of the cavern.

. . . *IMT made the sky / Fall . . .*

Amalfi yawned ostentatiously and bent back to fastening the plate over the booster's observation port. Karst squatted near him, frankly asleep, as relaxed and comfortable as a cat drowsing on a high ledge. Heldon watched.

"I'm going to have to do the job for you," Amalfi said. "It's really major; might take weeks."

"I thought you would say so," Heldon said. "And I was glad to give you the time to find out. But I do not think we will make any such replacements."

"You need 'em."

"Possibly. But obviously there is a big factor of safety in the apparatus, or our ancestors would never have flown the city at all. You will understand, Mayor Amalfi, that we cannot risk your doing something to the machines which we cannot do ourselves, on the unlikely assumption that you are increasing their efficiency. If they will run as they are, that will have to be good enough."

"Oh, they'll run," Amalfi said. He began, methodically, to pack up his equipment. "For a while. I'll tell you flatly that they're not safe to operate, all the same."

Heldon shrugged and went down the spiral metal stairs to the floor of the chamber. Amalfi rummaged in the pack a moment more. Then he ostentatiously kicked Karst awake—and kicked hard, for he knew better than to play-act with a born overseer for an audience—and motioned the serf to pick up the bundle. They went down after Heldon.

The Proctor was smiling, and it was not a nice smile. "Not safe?" he said. "No, I never supposed that they were. But I think now that the dangers are mostly political."

"Why?" Amalfi demanded, trying to moderate his breathing. He was suddenly almost exhausted; it had taken—how many hours? He had no idea.

"Are you aware of the time, Mayor Amalfi?"

"About morning, I'd judge," Amalfi said dully, jerking the pack more firmly onto Karst's drooping left shoulder. "Late, anyhow."

"Very late," Heldon said. He was not disguising his expression now. He was openly crowing. "The contract between your city and mine expired at noon today. It is now nearly an hour after noon; we have been here all night and morning. And your city is still on our soil, in violation of the contract, Mayor Amalfi."

"An oversight—"

"No; a victory." Heldon drew a tiny silver tube from the folds of his robe and blew into it. "Mayor Amalfi,

you may consider yourself a prisoner of war."

The little silver tube had made no audible sound, but there were already ten men in the room. The mesotron rifles they carried were of an ancient design, probably pre-Kammerman, like the spindizzies of IMT.

But, like the spindizzies, they looked as though they would work.

#### IV.

Karst froze; Amalfi unfroze him by jabbing him surreptitiously in the ribs with a finger, and began to unload the contents of his own small pack into Karst's.

"You've called the Earth police, I suppose?" he said.

"Long ago. That way of escape will be cut off by now. Let me say, Mayor Amalfi, that if you expected to find down here any controls that you might disable—and I was quite prepared to allow you to search for them—you expected too much stupidity from me."

Amalfi said nothing. He went on methodically repacking the equipment.

"You are making too many motions, Mayor Amalfi. Put your hands up in the air and turn around very slowly."

Amalfi put up his hands and turned. In each hand he held a small black object about the size and shape of an egg.

"I expected only as much stupidity as I got," he said conversationally. "You can see what I'm holding up there. I can and will drop one or both of them if I'm shot. I may drop them anyhow. I'm tired of your back-cluster ghost town."

Heldon snorted. "Explosives? Gas? Ridiculous; nothing so small could contain enough energy to destroy the city; and you have no masks. Do you take me for a fool?"

"Events prove you one," Amalfi said steadily. "The possibility was quite large that you would try to ambush me, once you had me in the city. I could have forestalled that by bringing a guard with me. You haven't met my perimeter police; they're tough boys, and they've been off duty so long that they'd love the chance to tangle with your palace crew. Didn't it occur to you that I left my city without a bodyguard only because I had less cumbersome ways of protecting myself?"

"Eggs," Heldon said scornfully.

"As a matter of fact, they *are* eggs; the black color is an annaline stain, put on the shells as a warning. They contain chick embryos inoculated with a two-hour alveolytic mutated Terrestrial rickettsialpox—a new air-borne strain developed in our own BW lab. Free space makes a wonderful laboratory for that kind of trick; an Okie town specializing in agronomy taught us the techniques a couple of centuries back. Just a couple of eggs—

but if I were to drop them, you would have to crawl on your belly behind me all the way back to my city to get the antibiotic shot that's specific for the disease; we developed that ourselves, too."

There was a brief silence, made all the more empty by the hoarse breathing of the Proctor. The armed men eyed the black eggs uneasily, and the muzzles of their rifles wavered out of line. Amalfi had chosen his weapon with great care; static feudal societies classically are terrified by the threat of plague—they have seen so much of it.

"Impasse," Heldon said at last. "All right, Mayor Amalfi. You and your slave have safe-conduct from this chamber—"

"From the building. If I hear the slightest sound of pursuit up the stairs, I'll chuck these down on you. They burst hard, by the way—the virus generates a lot of gas in chick-embryo medium."

"Very well," Heldon said, through his teeth. "From the building, then. But you have won nothing, Mayor Amalfi. If you can get back to your city, you'll be just in time to be an eyewitness of the victory of IMT—the victory you helped make possible. I think you'll be surprised at how thorough we can be."

"No, I won't," Amalfi said, in a flat, cold, and quite merciless voice. "I know all about IMT, Heldon. This is the end of the line for the Mad

Dogs. When you die, you and your whole crew of Interstellar Master Traders, *remember Thor V.*"

Heldon turned the color of unsized paper, and so, surprisingly, did at least four of his riflemen. Then the blood began to rise in the Proctor's plump, fungoid cheeks. "Get out," he croaked, almost inaudibly. Then, suddenly, at the top of his voice: "Get out! *Get out!*"

Juggling the eggs casually, Amalfi walked toward the lead radiation-lock. Karst shambled after him, cringing as he passed Heldon. Amalfi thought that the serf might be overdoing it, but Heldon did not notice; Karst might as well have been—a horse.

The lead plug swung to, blocking out Heldon's furious, frightened face and the glint of the fluorescents on the ancient spindizzies. Amalfi plunged one hand into Karst's pack, depositing one egg in the silicone-foam nest from which he had taken it, and withdrew the hand again grasping an ugly Schmeisser acceleration-pistol. This he thrust into the waistband of his breeches.

"Up the stairs, Karst. Fast. I had to shave it pretty fine. Go on, I'm right behind you. Where would the controls for those machines be, by your guess? The control lead went up through the roof of that cavern."

"On the top of the Temple," Karst said. He was mounting the narrow

steps in huge bounds, but it did not seem to cost him the slightest effort. "Up there is Star Chamber, where the Great Nine meets. There isn't any way to get to it that I know."

They burst up into the cold stone antechamber. Amalfi's flash roved over the floor, found the jutting pyramid; Amalfi kicked it. With a prolonged groan, the tilted slab settled down over the flight of steps and became just another block in the floor. There was certainly some way to raise it again from below, but Heldon would hesitate before he used it; the slab was noisy in motion, noisy enough to tell Amalfi that he was being followed. At the first such squawk, Amalfi would lay a black egg, and Heldon knew it.

"I want you to get out of the city, and take every serf that you can find with you," Amalfi said. "But it's going to take timing. Somebody's got to pull that switch down below that I asked you to memorize, and I can't do it; I've got to get into Star Chamber. Heldon will guess that I'm going up there, and he'll follow me. After he's gone by, Karst, you have to go down there and open that switch."

Here was the low door through which Heldon had first admitted them to the Temple. More stairs ran up from it. Strong daylight poured under it.

Amalfi inched the old door open and peered out. Despite the brightness of the afternoon, the close-set,

chunky buildings of IMT turned the alleyway outside into a confusing multitude of colored shadows. Half a dozen leaden-eyed serfs were going by, with a Proctor walking behind them, half asleep.

"Can you find your way back into that crypt?" Amalfi whispered.

"There's only one way to go."

"Good. Go back then. Dump the pack outside the door here; we don't need it any more. As soon as Heldon's crew goes on up these stairs, get back down there and pull that switch. Then get out of the city; you'll have about four minutes of accumulated warm-up time from all those tube stages; don't waste a second of it. Got it?"

"Yes. But—"

Something went over the Temple like an avalanche of gravel and dwindled into some distance. Amalfi closed one eye and screwed the other one skyward. "Rockets," he said. "Sometimes I don't know why I insisted on a planet as primitive as this. But maybe I'll learn to love it. Good luck, Karst."

He turned toward the stairs.

"They'll trap you up there," Karst said.

"No, they won't. Not Amalfi. But me no buts, Karst. Git."

Another rocket went over, and far away there was a heavy explosion. Amalfi charged like a bull up the new flight of stairs toward Star Chamber.

The staircase was long and widely curving, as well as narrow, and both its risers and its treads were infuriatingly small. Amalfi remembered that the Proctors did not themselves climb stairs; they were carried up them on the forearms of serfs. Such pussy-ant steps made for sure footing, but not for fast transit.

As far as Amalfi was able to compute, the steps rose gently along the outside curvature of the Temple's dome, following a one-and-half helix to the summit. Why? Presumably, the Proctors didn't require themselves to climb long flights of stairs for nothing, even with serfs to carry them. Why couldn't Star Chamber be under the dome with the spindizzies, for instance, instead of atop it?

Amalfi was not far past the first half-turn before one good reason became evident. There was a rustle of voices jostling its way through the chinks in the dome from below; a congregation, evidently, was gathering. As Amalfi continued to mount the flat spiral, the murmuring became more and more discrete, until individual voices could almost be separated out from it. Up there at what mathematically would be the bottom of the bowl, where the floor of Star Chamber was, the architect of the Temple evidently had contrived a whispering-gallery—a vault to which a Proctor might put his ear, and hear the thinnest syllable of conspiracy in the crowd of suppliants below.

It was ingenious, Amalfi had to admit. Conspirators on church-bearing planets generally tend to think of churches as safe places for quiet plotting. In Amalfi's universe—for he had never seen Earth—any planet which sponsored churches probably had a revolt coming to it.

Blowing like a porpoise, he scrambled up the last arc of the long Greek-spiral staircase. A solidly-closed double door, worked all over with phony Byzantine scrolls, stood looking down at him. He didn't bother to stop to admire it; he hit it squarely under the paired, patently synthetic sapphires just above its center, and hit it hard. It burst.

Disappointment stopped him for a moment. The chamber was an ellipse of low eccentricity, monastically bare and furnished only with a heavy wooden table and nine chairs, now drawn back against the wall. There were no controls here, nor any place where they could be concealed. The chamber was windowless.

The lack of windows told him what he wanted to know. The other, the compelling reason why Star Chamber was on top of the Temple dome was that it harbored, somewhere, the pilot's cabin of IMT. And that, in as old a city as IMT, meant that visibility would be all-important—requiring a situation atop the tallest structure in the city, and as close to 360° visibility as could be managed. Obviously, Amalfi was not yet up high enough.

He looked up at the ceiling. One of the big stone slabs had a semicircular cup in it, not much bigger than a large coin. The flat edge was much worn.

Amalfi grinned and looked under the wooden table. Sure enough, there it was—a pole with a hooked bill at one end, rather like a halberd, slung in clips. He yanked it out, straightened, and fitted the bill into the opening in the stone.

The slab came down easily, hinged at one end as the block down below over the generator room had been. The ancestors of the Proctors had not been much given to varying their engineering principles. The free end of the slab almost touched the table top. Amalfi sprang onto the table and scrambled up the tilted face of the stone; as he neared the top, the translating center of gravity which he represented actuated a counterweighing mechanism somewhere, and the slab closed, bearing him the rest of the way.

This was the control cabin, all right. It was tiny and packed with panels, all of which were covered with dust. Bull's-eyes of thick glass looked out over the city at the four compass-points, and there was one set in overhead. A single green light was glowing on one of the panels. While he walked toward it, it went out.

That had been Karst, cutting the power. Amalfi hoped that the peasant would get out again. He had grown to like him. There was something in his

weathered, unmovable, shockproof courage, and in the voracity of his starved intelligence, that reminded the mayor of someone he had once known. That that someone was Amalfi as he had been at the age of twenty-five, Amalfi did not know, and there was no one else who would be able to tell him.

Spindizzies in essence are simple; Amalfi had no difficulty in setting and locking the controls the way he wanted them, or in performing sundry small tasks of highly selective sabotage. How he was to conceal what he had done, when every move left huge smears in the heavy dust, was a tougher problem. He solved it at length in the only possible way: he took off his shirt and flailed it at all of the boards. The result made him sneeze until his eyes watered, but it worked.

Now all he had to do was get out.

There were already sounds below in Star Chamber, but he was not yet worried about a direct attack. He still had one of the black eggs, and the Proctors knew it. Furthermore, he also had the pole with the hooked bill, so that in order to open up the control room at all, the Proctors would have to climb on each other's shoulders. They weren't in good physical shape for gymnastics, and besides they would know that men indulging in such stunts could be defeated temporarily by nothing more complicated than a kick in the teeth.

Nevertheless, Amalfi had no intention of spending the rest of his life in the control room of IMT. He had only about six minutes to get out of the city altogether.

After thinking very rapidly for approximately four seconds, Amalfi stood on the stone slab, overbalanced it, and slid solemnly down onto the top of the table in Star Chamber.

After a stunned instant, half a dozen pairs of hands grabbed him at once. Heldon's face, completely unrecognizable with fury and fear, was thrust into his.

"What have you done? Answer, or I'll order you torn to pieces!"

"Don't be a lunkhead. Tell your men to let go of me. I still have your safe-conduct — and in case you're thinking of repudiating it, I still have the same weapon I had before. Cast off, or—"

Heldon's guards released him before he had finished speaking. Heldon lurched heavily up onto the table top and began to claw his way up the slab. Several other robed, bald-headed men jostled after him—evidently Heldon had been driven by a greater fear to tell some of the Great Nine what he had done. Amalfi walked backwards out of Star Chamber and down two steps. Then he bent, deposited his remaining black egg carefully on the threshold, and took off down the spiral stairs at a dead run.

It would take Heldon a while, per-

haps as much as a minute, after he switched on the controls to discover that the generators had been cut out while he was chasing Amalfi; and another minute, at best, to get a flunky down into the basement to turn them on again. Then there would be a warm-up time of four minutes. After that—IMT would go aloft.

Amalfi shot out into the alleyway and thence into the public square, caroming off an astounded guard. A shout rose behind him. He doubled over and kept running.

The street was nearly dark in the twilight of the twin suns. He kept in the shadows and made for the nearest corner. The cornice of the building ahead of him abruptly turned lava-white, then began to dim through the red. He never did hear the accompanying scream of the mesotron rifle. He was concentrating on something else.

Then he was around the corner. The quickest route to the edge of the city, as well as he could recall, was down the street he had just quitted, but that was now out of the question; he had no desire to be burned down. Whether or not he could get out of IMT in time by any alternate route remained to be seen.

Doggedly, he kept running. He was fired on once more, by a man who did not really know on whom he was firing. Here, Amalfi was just a running man who failed to fit the categories; any first shot at him would be a reflex of disorientation, and consequently

aimed badly.

The ground shuddered, ever so delicately, like the hide of a monster twitching at flies in its sleep. Somehow, Amalfi managed to run still faster.

The shudder came again, stronger this time. A long, protracted groan followed it, traveling in a heavy wave through the bedrock of the city. The sound brought Proctors and serfs alike boiling out of the buildings.

At the third shock, something toward the center of the city collapsed with a sullen roar. Amalfi was caught up in the aimless, terrified eddying of the crowd, and fought, with hands, teeth and bullet head—

The groaning grew louder. Abruptly, the ground bucked. Amalfi pitched forward. With him went the whole milling mob, falling in windrows like stacked grain. There was frantic screaming everywhere, but it was worse inside the buildings. Over Amalfi's head a window shattered explosively, and a woman's body came twisting and tumbling through the shuddering air.

Amalfi heaved himself up, spitting blood, and ran again. The pavement ahead was cracked in great, irregular shards, like a madman's mosaic. Just beyond, the blocks were tilted all awry, reminding Amalfi irrelevantly of a breakwater he had seen on some other planet, in some other century—

He was clambering over them be-

fore he realized that these could only mark the rim of the original city of IMT. There were still more buildings on the other side of the huge, rock-filled trench, but the trench itself showed where the perimeter of the ancient Okie had been sunk into the soil of the planet. Fighting for air with saw-edged râles, he threw himself from stone to stone toward the far edge of the trench. This was the most dangerous ground of all; if IMT were to lift now, he would be ground as fine as mincemeat in the tumbling rocks. If he could just reach the marches of the Barrens—

Behind him, the groaning rose steadily in pitch, until it sounded like the tearing of an endless sheet of metal. Ahead, across the Barrens to the east, his own city gleamed in the last rays of the twin suns. There was fighting around it; little bright flashes were sputtering at its edge. The rockets Amalfi had heard, four of them, were arrowing across the sky, and black things dropped from them. The Okie city responded with spouts of smoke.

Then there was an unbearably bright burst. After Amalfi could see again, there were only three rockets. In another few seconds there wouldn't be any: the City Fathers never missed.

Amalfi's lungs burned. He felt sod under his sandals. A twisted runner of furze lashed across his ankle and he fell again.



He tried to get up and could not. The seared turf, on which an ancient rebel city once had stood, rumbled threateningly. He rolled over. The squat towers of IMT were swaying, and all around the edge of the city, huge blocks and clods heaved and turned over, like surf. Impossibly, a thin line of light, intense and ruddy, appeared above the moiling rocks. The suns were shining *under the city*—

The line of light widened. The old city took the air with an immense bound, and the rending of the long-rooted foundations was ear-splitting. From the sides of the huge mass, human beings threw themselves desperately toward the Barrens; all those Amalfi saw were serfs. The Proctors, of course, were still trying to control the flight of IMT—

The city rose majestically. It was gaining speed. Amalfi's heart hammered. If Heldon and his crew could figure out in time what Amalfi had done to the controls, Karst's old ballad would be re-enacted, and the crushing rule of the Proctors made safe forever.

But Amalfi had done his work well.

The city of IMT did not stop rising. With a profound, visceral shock, Amalfi realized that it was already nearly a mile up, and still accelerating. The air would be thinning up there, and the Proctors had forgotten too much to know what to do—

A mile and a half.

Two miles.

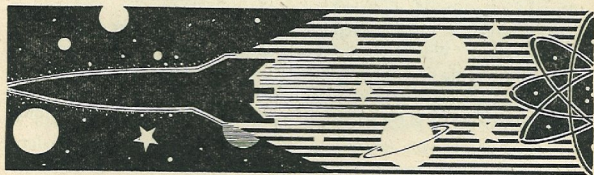
It grew smaller. At five miles it was just a wavy ink-blot, lit on one side. At seven miles it was a point of dim light.

A bristle-topped head and a pair of enormous shoulders lifted cautiously from a nearby gully. It was Karst. He continued to look aloft for a moment, but IMT at ten miles was invisible. He looked down to Amalfi.

"Can . . . can it come back?" he said huskily.

"No," Amalfi said, his breathing gradually coming under control. "Keep watching, Karst. It isn't over yet. Remember that the Proctors had called the Earth cops—"

At that same moment, the city of IMT reappeared—in a way. A third sun flowered in the sky. It lasted for three or four seconds. Then it dimmed



and died.

"The cops were warned," Amalfi said softly, "to watch for an Okie city trying to make a getaway. They found it, and they dealt with it. Of course they got the wrong city, but they don't know that. They'll go home now—and now we're home, and so are you and your people. Home on Earth, for good."

Around them, there was a murmuring of voices, hushed with disaster, and with something else, too—something so old, and so new, that it hardly had a name on the planet that IMT

had ruled. It was called freedom.

"On Earth?" Karst repeated. He and the mayor climbed painfully to their feet. "What do you mean? This is not Earth—"

Across the Barrens, the Okie city glittered—the city that had pitched camp to mow some lawns. A cloud of stars was rising behind it.

"It is now," Amalfi said. "We're all Earthmen, Karst. Earth is more than just one little planet, buried in another galaxy than this. Earth is much more important than that.

"Earth isn't a place. It's an idea."

THE END

## TIME TO LEARN

Any learning involves risk; if you already knew how to do it safely, you wouldn't be learning.

The greater the rate of learning, the greater the degree of risk.

Then how fast should one learn?

That question can't be answered just yet—but there's another question that can be answered. "What's the lowest rate of learning that can be accepted?"

The answer to that's easy. "At least fast enough to stay alive."

Perhaps in the social-psychological fields, it's time to start learning in a frantic hurry. The risk of *not* learning is beginning to exceed the risk of learning.

# THE LOGICAL PARALLAX

BY DR. GOTTHARD GUNTHER

*Dr. Gunther's work on multi-valued logic is now attracting acutely interested attention among logicians; this is a general discussion of what it means logically to say that a thing is both true and not-true.*

## I.

A most exasperating situation has developed in modern logic during the last two or three decades. On the one hand it has been pointed out with absolutely indisputable arguments that the only possible logic of Man is Aristotelian, that is two-valued. On the other hand a considerable number of many-valued calculi of symbolic logic have been developed during the same period, and their proponents take it as a matter of course that they have discovered a new non-Aristotelian system of rational thinking.

Something must be wrong here. If the Aristotelian logic is the only system of thinking man can ever use, then it should not be possible at all to develop many-valued calculi of symbolic logic. But the existence of three-valued, four-valued and gen-

erally  $n$ -valued calculi is an undeniable fact. And nobody can contradict factual existence. So the camp followers of Aristotle *must* be wrong. However, the defenders of the two-valued system are not impressed at all by the foregoing argument. "Have you ever," they usually retort, "really attempted to think with, let us say, a seven-valued logic? Well, you can't, no matter how hard you try. It is an absolute psychological impossibility. And that is a fact, too."

Obviously we have reached an impasse. If both sides are able to appeal to the authority of existing facts, then only one conclusion is permissible: the general basis of the whole controversy is unacceptable; or, to put it more technically, both sides share a logical premise that is false. The whole controversy, of course, is based on the mutually agreed assumption that in the case "two-valued system versus many-valued

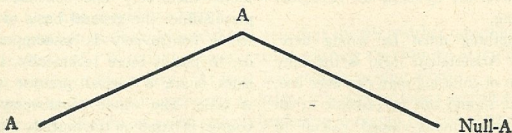
system" different forms of logic compete with each other. It is tacitly assumed that the Aristotelian theory of thinking is opposed and may be superseded by a non-Aristotelian mentality of man which has finally come to the surface after several thousand years of human history.

However, this general premise that the coexistence of two- and many-valued calculi indicates a case of competing logics must be wrong, if it leads us to the predicament that both sides are able to retrench behind unassailable facts, and to take up positions from which they can never be dislodged. In order to get on with the problem we have, therefore, no other choice but to discard the general assumption that the whole discussion revolves around the alternative Aristotelian logic contra Null-A logic. So far so good.

But now a very different sort of trouble—slightly on the ridiculous side—turns up. We have no issue left at all! What on earth could be

the difference between a two-valued and a many-valued symbolic calculus if not a difference of logic and rational meaning? It stands to reason there must be one. But it is equally clear that we have not discovered it yet. The only thing we can do now is to re-examine the positions of the two logical schools of thinking.

All Aristotelian claims essentially boil down to one very impressive argument. First, it is assumed that two different systems of logic, Aristotelian and non-Aristotelian, do co-exist. But if this is the case, then we obtain immediately an Aristotelian alternative between the Aristotelian system A and the competing system Null-A. Because whenever a factual problem occurs we shall have to *decide* whether it has to be solved with the help of A or of Null-A. Our decision will either be true or false. In other words: it is again a two-valued logic which decides between A and Null-A. A simple diagram may illustrate this interesting property of our traditional logic:



In more technical language: an assumed plurality of logical systems leads only to a re-iteration of the Aristotelian logic. In our diagram the traditional two-valued logic A shows up twice. The lower occurrence indicates the theoretical level, the one on top the action—decision—level. This is significant because it shows an essential difference within the concept of A. At any rate it is impossible to get away from the fact that the Aristotelian system A contains itself and any other hypothetical logic as subsystems within itself.

But what about the claims of the many-valued calculi. Their case seems to be almost as strong as that of their opponent. The case of Null-A essentially rests on the following argument: If you formalize the Aristotelian logic, you get a two-valued calculus. Now there is no logical reason why anyone should stop at the number "2" when introducing logical values. From the viewpoint of the calculus the number "2" is as arbitrary as any other number in the natural system of numbers. We might as well demand from people that they stop counting when they have reached the number three hundred sixty-five, because it is the number of days in a year. But what about the man who has four hundred dollars in his purse? There is indeed no reason at all—neither on Earth nor in heaven—why symbolic calculi of logic should

stop at the number of two values. "2" is just an arbitrary number and has in the system of symbolic calculi no more and no less right than "7" or "60,000." Many-valued calculi are here to stay and all orthodox Aristotelians had better get reconciled to that prospect.

But that does not permit the conclusion that a many-valued calculus of symbolic logic necessarily represents a new non-Aristotelian system of logic, a higher system of reasoning which the Man of the Future might finally grow into. The very origin of the many-valued calculi of logic suggests a different interpretation. How did symbolic calculi generally come into existence? Well, there was first the actual Aristotelian *practice* of thinking, and after man had employed that practice for several thousand years he finally discovered the technique of formalizing his processes of thinking, and of expressing them as two-valued—symbolic calculus. This happened quite recently. In fact not before 1854! (Cf. George Boole, *An Investigation of the Laws of Thought*. London 1854). But did the many-valued calculi originate in the same way? Did man first develop new habits of actual thinking, and after he had done so, formalize them into new many-valued calculi of logic? Most certainly not! All so-called non-Aristotelian calculi were produced as formal generalizations of the two-valued system *with no reference to*

*actual human thought processes.*

This difference of origin establishes an enormous semantical distinction between the two-valued system and all its many-valued amplifications and generalizations. The two-valued calculus represents an *interpreted* system. An interpreted system is one where we know exactly what its formulas mean in terms of factual existence. An uninterpreted system is one whose formulas are developed without any regard to the meaning they may carry. They may have an objective meaning or they may not. We do not know it. The interpretational contents of the two-valued symbolic logic are the actual thinking-events that occur in every individual consciousness. Aristotle was the first to observe these events that take place in every individual subject of rational behavior, and the subsequently developed two-valued calculus describes the exact laws these thinking-events are governed by. For this very reason the two-valued calculus is called an interpreted system. Its interpretation is the fact that it describes in formal symbolic terms the actual events of rational human thinking for any given individual.

However, the many-valued calculi were not developed in accordance with that semantical pattern. There is no actual thinking these calculi are meant to depict. They came into existence by a very abstract and formal generalization of the two-

valued system. It follows that all many-valued calculi are as yet *uninterpreted* symbolic patterns of *unknown facts!* But what do these systems describe? The two-valued calculus describes human thinking as it occurs in every rational consciousness. We shall, therefore, from now on insist, that "thinking" and "Aristotelian thinking" are exactly equivalent terms. *A many-valued calculus does not designate any form of actual thinking.* This much is absolutely certain. But what does it designate? The second part of this article shall give the answer to that question.

## II.

Have you ever stopped to reflect how semantically ambiguous the term "the universe" is? If we speak about the universe we mean, of course, the all-comprehensive realm of existence in our space and time. In other words, the term "the universe" denotes the sum of *all* events and *all* objects that have been in existence, that are in existence, and that ever shall be in existence. So far there seems to be nothing ambiguous about this concept. But let us look at the semantical implication of the idea and the trouble will show up at once. I, the present writer, say: "the universe." This concept contains besides everything else my own body—including my brain—but, strange to say, it does *not* include my consciousness—

whatever that may be. It simply cannot do so, because it is a *content* of my consciousness.

The very fact that I conceive this term excludes my conception from it. To be sure, the consciousness of everybody else—living or dead or yet unborn—is included in my concept of the universe. But my own thinking, that produces the term, is unconditionally excluded. In philosophical language: my own thinking represents the *subject* that conceives the *object* "universe." That might be tolerated as a regrettable but unavoidable incompleteness of our term, were it not for the fact that I am not the only one who does his own thinking and who conceives the general conception of the universe.

Albert Einstein, for instance, does his own thinking! It stands to reason that *his* conception of the universe contains the present writer completely with all his thought processes, in short, with his whole subjectivity. The subject "Gotthard Gunther" is fully included in the Einsteinian universe. But not the subject "Albert Einstein"! As far as he produces the idea "the universe" the Einsteinian thought process is excluded from that term. The term remains the same, but its definable contents vary according to the person who conceives it. We thus arrive at three different meanings for the term "the universe."

Let "U" represent the meaning of the concept without any reference

to any thought process, and "U<sup>s</sup>" my idea of the universe, and "U<sup>o</sup>" that of any other person—for instance, Einstein. You can then postulate the simple equations:

$$U = U^s \quad 1$$

$$U = U^o \quad 2$$

These equations mean that I claim my idea of the universe is correct, and the other person makes exactly the same claim. It follows that, if we use the equations 1 and 2 as premises of a syllogism, we should be entitled to the conclusion:

$$U^s = U^o \quad 3$$

But equation 3 is false. Instead, it holds:

$$U^s \neq U^o \quad 4$$

In words: "U<sup>s</sup>" and "U<sup>o</sup>" are not identical concepts. To use our former example again: "U<sup>s</sup>" defines me, the present writer, as the subject and Mr. Einstein is wholly included in "U," whereas "U<sup>o</sup>" defines Einstein as subject, and I am completely included—with all my thought processes—in "U."

The situation is not entirely new. It has its corollary in astronomy. If we speak offhandedly of the location of a star, three different meanings of the term "location" are implied. A, The objective location of the star with reference to the galactic system it belongs to; B, my visual location of it; and C, the visual location for a second observer at a different point in space. The difference between

B and C is called the parallax of the star. All observers agree as to the hypothetical data of A. But A is not an observational fact. Its value can only be deduced from the observed data of B and C. This is important. Although we all potentially agree about the objective location of a star, A, all actual scientific experience accessible to us is represented by B and C.

Exactly the same is the case with our general logical reference to the universe as an objective totality. Here again we agree that the "absolute" term "U" should have exactly the same meaning for anybody. To return again to our former example: "U" should contain the mental processes of "Einstein" and "Gunther" at the same time. But "U" is logically accessible to us only as "U<sup>s</sup>" and "U<sup>o</sup>." *We therefore have to conclude that the universe is given us only under the condition of a logical parallax.* Its contents vary to a certain degree if we shift from the logical observer "...<sup>s</sup>" to any second subjective viewpoint "...<sup>o</sup>."

This has amazing logical implications and throws a revealing light on the mysterious role of the many-valued calculi. We shall now demonstrate the case of the logical parallax with the help of a very simple Aristotelian concept, the logical term "and." The meaning of "and" is expressed in symbolic two-valued logic with the help of the truth-table

p	q	p & q	I
T	T	T	
T	F	F	
F	T	F	
F	F	F	

Let "T" mean "true" and "F" correspondingly "false," then table I tells us that "p" and "q" (p & q) are only true together, when "p" and "q" are singly true. Therefore, the case of a true conjunction of "p" and "q" occurs only in the first line of the truth columns. A practical example may demonstrate that. Let "p" mean: "Roosevelt is dead" and "q" may stand for "Stalin is dead"; then the compound statement "Roosevelt and Stalin are dead" (p & q) will only be true if the truth-value "T" attaches to "p" as well as "q." In all the other cases the compound-statement will be false. (For more details cf. the article "Symbolic Logic and Metamathematics," by Crispin Kim-Bradley, *Astounding*, XLVIII, 6 pp. 94-102.)

Up to now it has been tacitly assumed that if two different persons use the table I no shift of meaning occurs that might affect the functional characteristics of our table. But now let us look at the following conjunctive statement:

I and the universe exist.                    A  
 If the present writer pronounces it,  
 it has the meaning:

Gunther and the universe exist.        B

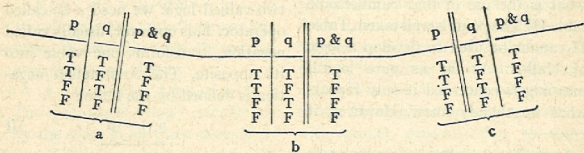


If Einstein makes the statement A, it necessarily means:

Einstein and the universe exist. C This difference cannot be expressed by the truth-table (I). That is why the statement A has been regarded as meaningless within the context of symbolic logic up to now.

But let us now assume that relative to A the logical meaning of "and" in B and C is somehow "displaced."

We will illustrate that "displacement" in a naive, figurative way by writing down three identical truth-tables and tilting them against each other:



This arrangement is intended to convey the idea that A the universe in general is Aristotelian; B my view of it is also Aristotelian; and C the view of any other person I might choose is again determined by Aristotelian categories. But these categories are slightly displaced relative to each other and produce different viewpoints.

It is, of course, impossible to express in geometrical angles the displacement a logical concept is bound to suffer if conceived by different individuals.

But this is the point where the theory of the many-valued calculi takes over . . . and where we discover the meaning and the function of Null-A. In order to express the displacement our logical term "and" is subjected to if we shift from A to B or C we have merely to repeat the above truth-function in a new table which contains a new, a third value between "T" and "F." We call it the displacement value and indicate it with the letter combination "Dspl." This leads us to a three-valued truth-function and we discover that the Aristotelian meaning of "and" unexpectedly

appears in the shape of *three* different truth-functions:

p	q	p & <sup>a</sup> q	p & <sup>b</sup> q	p & <sup>c</sup> q	II
T	T	T	T	T	T
T	Dspl	Dspl	F	Dspl	Dspl
T	F	F	F	F	F
Dspl	T	Dspl	T	Dspl	Dspl
Dspl	Dspl	Dspl	Dspl	Dspl	Dspl
Dspl	F	F	F	Dspl	Dspl
F	T	F	F	F	F
F	Dspl	F	F	Dspl	Dspl
F	F	F	F	F	F

\* There is a very elementary way to construct table II. We number our values "T" = 1, "Dspl" =

If one takes the pains to compare table II very carefully with table I, one cannot help noticing that whenever the "p" and "q" columns show exclusively "T" and "F" values all three truth-functions of II agree completely with the two-valued meaning of "and." In other words: as far as the Aristotelian alternative of "true" and "false" is concerned our three-valued functions are identical with each other as well as with the traditional two-valued meaning of "and."

At this juncture the patient reader might very well ask: "if the three-valued table merely repeats our familiar Aristotelian meaning of "and," what is the use of that cumbersome table II? The point is well taken. Table II cannot be used to develop a logic of Null-A. As far as pure logical meaning is concerned it only repeats what we already know. However, it

= 2, and "F" = 3. We then discover that in table I the value "3" is the preferential one. It means "3" as the highest value is always chosen when available in the columns "p" and "q." However, as soon as we have three values, as in table II, six different preferential orders are possible. They are:

3	2	1
3	1	2
2	3	1
2	1	3
1	3	2
1	2	3

If the sum of the first two values of one of these preferential orders is bigger than the sum of the last two values, then the order belongs to the group of conjunctions. This is indeed the case for the first three preferential orders. The values for "p & q" are then chosen by putting the value "F" in the truth-function column, whenever available in the "p" and "q" columns. If no "F" is available, then "Dspl" = 2 is chosen, and "T" is only used if neither "F" nor "Dspl" is available. For the second function "p & b q" the value "F" = 3 is again first choice. But, if not available, "T" = 1 is chosen a.s.o.

provides us with the principles of a displacement calculus by dint of which we can express in exact theoretical formulas the logical parallax inherent in the application of our Aristotelian logic. This is the significance of the three-valued and—as we shall see presently—of all many-valued calculi. The third and last part of this article shall demonstrate, how logical displacements of meaning are calculated, and shall moreover draw some general philosophical conclusions.

### III.

In order to operate our traditional two-valued logic we need a so-called operator. This operator, usually called negation, transforms one value into its opposite. The Aristotelian negation is defined by the table:

p	$\sim$ p	III
T	F	
F	T	

The table indicates that if "p" is true, then " $\sim$ p" non-p is "false," and vice versa. It is obvious that you cannot calculate displacement values with the help of table III. In order to be able to do so we now replace our single Aristotelian negation by two half-negations which shall be defined by the two sub-tables III<sup>1</sup> and III<sup>2</sup>:

p	$\sim$ p (III <sup>1</sup> )	p	$\sim$ p (III <sup>2</sup> )
T	Dspl	Dspl	F
Dspl	T	F	Dspl

That means: if I negate "p" by writing " $\sim p$ " I do not obtain any more the value "false" provided "p" is true. From now on I obtain only the intermediate displacement value "Ds-pl." In order to arrive at "F" I shall have to complete a second half-step of negation " $\sim' p$ ."

The two tables III<sup>1</sup> and III<sup>2</sup> are all that is needed to calculate the logical parallax between the objective meaning A of "and," my personally restricted viewpoint B of it, and the viewpoint C of any third person. By using our half-negations we discover that the shift from A to B is expressed by the formula

$$p \&^a q \equiv \sim (\sim p \&^b \sim q) \quad 5$$

To calculate the subjective parallax between A and C we use the second half-negation and obtain

$$p \&^a q = \sim' (\sim p \&^o \sim' q) * 6$$

The meaning of "and" remains exactly the same in all three cases of A, B, and C. It is impossible that it should be otherwise, because every-time the "p" and "q" columns carry exclusively "T" and "F" values the

\* These formulas are obtainable by the simple method of constructing tables with negated "p" and "q" instead of positive "p" and "q." The appropriate conjunction of table II is then executed and the resulting function is again negated with the same negational operator. The logical displacement between " $p \&^b q$ " and " $p \&^o q$ " involves a more complicated negational pattern. For those interested in the specific technique of a three-valued logic the two relevant formulas are herewith given:

$$p \&^b q \equiv \sim (\sim' (\sim p) \&^o \sim' (\sim q))$$

$$p \&^o q \equiv \sim' (\sim' (\sim p) \&^b \sim' (\sim q))$$

These formulas are more involved because the relations between two different individual viewpoints are always more complicated than the relation between the objective world A and one subjective viewpoint B or the other C.

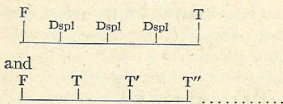
result will be invariably the same as in the original table I. The formulas 5 and 6 measure only the degree of the displacement relative to some objective standard A. Thus formula 5 indicates that between A and B there exists a displacement of a half value, whereas A and B are a full value apart.

Thus the three-valued calculus of symbolic logic becomes an *interpreted* system. Its interpretation is not, that it reveals the structure of a new non-Aristotelian logic. It is no new logic but a *system of transformations* by dint of which different logical viewpoints can be calculated and translated into each other. The three-valued calculus deals exclusively with the subjective differences between human beings as to their judgments of the surrounding world. What has been said with regard to the three-valued calculus applies—with proper generalization to any many-valued calculus of symbolic logic.

There are cases when the displacement of rational principles is undoubtedly much larger than between different human viewpoints. For instance: between human and animal intelligence. It is certain, that in the latter case we should need a calculus with more than three values. And again a much higher number of values would be needed if we wanted to calculate the relative displacement of intelligence as subjectively expressed in the human consciousness and ob-

jectively displayed in the rational structure of crystals.

Let me conclude this article with some further perspectives. Table II is not the only possible model of a three-valued truth-table. A second and different type is feasible. Table II is to be used only if we deal with displacement problems of human or subhuman (animal, plant . . .) intelligence. It handles only logical parallaxes expressible in *fractional* truth-values up to one full value. The following diagrams may demonstrate the essential difference:



The first diagram indicates that the whole range of one system is covered by the comprehensive alternative "true-false," and all displacement-values of many-valued calculi are located *inside* the simple F-T range. It stands to reason that the more "Displ" values are introduced the smaller our negational fractions will become. (Incidentally: taking the rational human consciousness with the full F-T range as standard measure, a consciousness described by very small negational fractions will be so much dimmer!) However, it is possible to construct a three- or many-valued calculus where the third—and any additional—value is placed *outside*

the range of F-T. The basic truth-tables of such systems, of course, vary greatly from our table II.

Let us call calculi based on this idea "systems of T-plurality." A first-order calculus of such a system would have the range F-T. The next would cover F-T', and so on. Viewed from the range of F-T'' the values "T" and "T'" would then not appear as *displacement*—but as *reduction-values* of "T." What is interesting about these systems of T-plurality is that they indicate a mentality higher than that of human individuals. There may be super-intelligent races in the universe which possess such higher spiritual faculties. However, this we do not know.

There is also the possibility that man himself may finally reach a stage of T-plurality intelligence. Yet for the time being, anyway, T-plurality calculi have no practical application, in contrast to displacement calculi, which can be used in their three-valued form to define the logical parallax in human thinking, and which are useful in their many-valued forms to interpret the lower forms of intelligence in animals, plants, et cetera.

But it should never be forgotten that, no matter how low or how high a certain intelligence level is, its essential structure is two-valued Aristotelian. This goes for the systems of T-plurality also. For an intelligence with the range F-T'' the reduction-values "T" and "T'" are no genuine

values. They only indicate procedures by which the wider range of F-T" can be reduced to the requirements of the lower intelligence forms F-T and F-T'.

Here a final question is in order: Let it be assumed that there are no higher forms of individual intelligence in the world than that of the human race. Is there any other possibility of applying logical calculi of T-plurality? Indeed, there seems to be at least one. The general structure of the universe can probably be described as a T-

plurality-system. Everybody knows the biblical formula: "In the beginning God created the heaven and the earth. . . ." For the logician this statement is a mythological version of the semantically equivalent proposition: the universe reflects for the human observer an intelligent pattern of a logical order that needs for its proper definition a system of T-plurality.

Gotthard Gunther: Die philosophische Idee einer nicht-Aristotelischen Logik. Proceedings of the XIth International Congress of Philosophy. Vol. V-8-4.

THE END

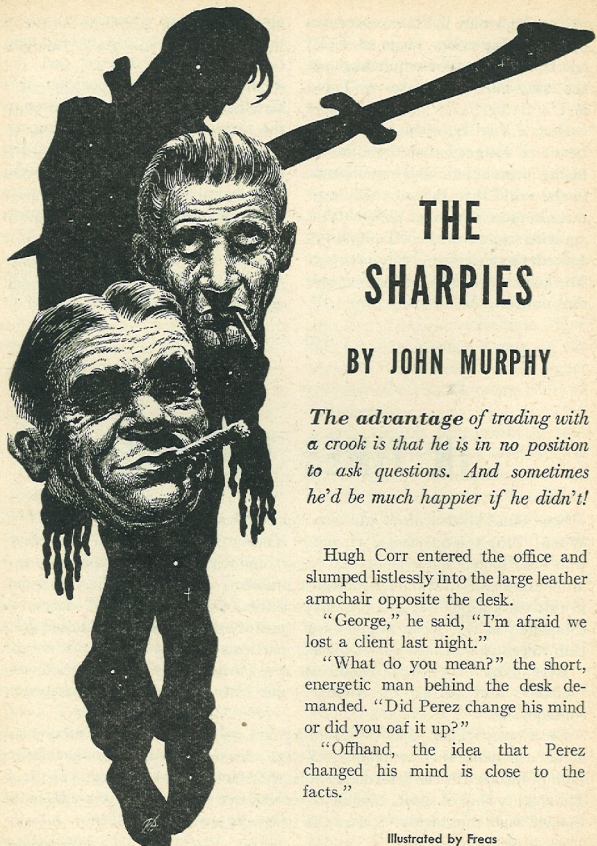
## IN TIMES TO COME

Next issue Mark Clifton and Alex Apostolides are back with "Hide! Hide! Witch!" Now this business of witchcraft is interesting stuff; a witch is somebody who does something without any understandable method. Clifton, having a lot of experience with the psychological problems of John Q. Public, brings out, in this yarn, a point I, as a physical scientist, would have missed—missed as completely as the central character of the story did. Sometimes it does take a club to get an idea into a man's head—particularly when he *knows* he's right.

Ever think under what conditions a scientist fulfills the definition of a "witch"? And will get the treatment our culture metes out to witches, in consequence!

Lee Correy's back, too, with another rocketship story. Since Correy's had actual experience with actual big rockets, he has a slight edge on understanding their problems. It's the little details, the petty factors, that are easy to overlook. The mighty ship of space, capable of roaring free of Earth's gravity! Hobbled, though, very thoroughly—by, as the title says, an "Ill Wind"!

THE EDITOR.



# THE SHARPIES

BY JOHN MURPHY

*The advantage of trading with a crook is that he is in no position to ask questions. And sometimes he'd be much happier if he didn't!*

Hugh Corr entered the office and slumped listlessly into the large leather armchair opposite the desk.

"George," he said, "I'm afraid we lost a client last night."

"What do you mean?" the short, energetic man behind the desk demanded. "Did Perez change his mind or did you oaf it up?"

"Offhand, the idea that Perez changed his mind is close to the facts."

Illustrated by Freas

"I don't believe it. He wanted those planes in the worst way. We were all set to close the deal today." George began to work himself up to a fine fury. "Why you big baboon, if you—"

"Easy, George, easy." Hugh held up a restraining hand. "I know that Perez wanted those planes real bad. But somebody else apparently didn't want him to have them. About eleven last night, that somebody stuck a large knife into dear old Perez who then took very sick and died."

There was a moment's silence. George rubbed his nose reflectively.

"How come they didn't get you, too?" he asked with mild interest.

"Perez was a little jumpy yesterday evening, it would seem with good cause, and when we got to his apartment house, he asked me to go ahead and see if there was anyone in the hall. There wasn't. When I went back, there he was, making like a doornail." Hugh shuddered slightly. "I made sure he was dead and then I went away from there."

"Any cops?"

"I didn't wait to see, but I guess some eventually came. There's a squib on page ten of this morning's paper saying that the body of a Senor Perez was found and that the police think his killing may have been for reasons connected with the politics of his native land."

"How right they are. I expect that those planes would have made the

difference for him and his revolution." A flash of concern crossed George's face. "Do you think that we're in the clear?"

"As far as the gendarmes go—yes. But if the lads that scragged Perez have been following him around, they may know that he'd been trying to do business through us." Hugh sighed gloomily. "I wish we were legitimate."

George was stung. "We are legitimate. If somebody wants something, we find it and buy it for him. It's none of our business what he is going to do with it."

They wrangled desultorily for a few minutes. It was apparently an old, familiar, and tired quarrel. Finally George voiced the question that had been in both their minds:

"Well, what do we do now?"

"With respect to *l'affaire* Perez, nothing. Except cancel the airplanes and stick to busy well-lighted streets for a while. But as for new business, I don't know. Have you had any nibbles from anyone?"

"No. So far I—" He was interrupted by the buzzing of his desk intercom. He flipped the switch.

"There are two gentlemen to see you, Mr. Hanley," it announced. George bit his lip indecisively. Abruptly he said, "Please show them in." Hugh raised his eyebrows.

"If it's Perez's pals, we might as well get a look at them," George told him. He opened his top righthand desk drawer and adjusted something within.

They both regarded the door expectantly.

Neither could restrain a start at the sight of the two men the pretty receptionist ushered into the room. Both were tall, broad shouldered and perfectly tailored. Their faces were handsome with a wooden regularity of feature. They were identical twins. Each carried a large new brief case.

"Mr. Hanley?" the man on the left asked.

George took his hand out of his desk drawer and admitted that he was Mr. Hanley. He introduced Hugh as his partner.

"I am John Smith and this is my brother Jesse Smith," the same one of the two continued. "We understand that you are commission agents?" The Smith's eyes were almost a true green.

"Yes, Mr. Smith, we certainly are. Won't you please sit down?" There was a wide smile of hearty good-fellowship on George's face. These were surely not from the homeland of the late lamented Senor Perez. They sounded like business and if the best names that they could think up were John and Jesse Smith, who was he to complain? "We have a wide reputation, gentlemen, for always deliv—"

"We know your reputation. We have investigated and determined that you are able, discreet, and without principles. Therefore we wish to employ you."

Hugh regarded the pair with deep interest. He wondered what they wanted and hoped that it wasn't hot surplus warplanes. There was a strange note in John Smith's voice; it was low and harsh and not at all in keeping with his suave exterior. Also, although there was no accent, it was definitely not the voice of a native American.

"In outline, we have something which we wish you to sell. Then with the money thus gained we want you to purchase a quantity of different items for us. Naturally, we expect to pay a commission." Jesse Smith spoke for the first time. His voice was a duplicate of his brother's. His face, as did his twin's, kept the immobility of a well trained poker player.

"Both on the sales and on the purchases?" George asked quickly.

"Of course."

George beamed. Hugh felt a doubt begin to form in his mind. This was too easy.

"What is it that you want us to sell?" he asked.

"Gold. We have here about four hundred pounds." John Smith indicated the two brief cases. "Since we are in a hurry and since we do not wish to explain our sources, we realize that you may not be able to sell it at the highest price. However, we expect that you should realize about fifteen thousand dollars. That should cover the first installment of our purchases. Here is a list of the items we want." He turned to his brother. Jesse took a



piece of paper from an inside pocket and passed it over the desk to George. George wrenched his eyes from the brief cases and nervelessly accepted the paper.

Both Smiths then rose. "We will return tomorrow with more gold. You may report your progress at that time." They turned to go.

"But . . . but—" George was at a loss.

Jesse seemed to have an afterthought. "You had better engage a warehouse to store our purchases. If possible, in some outlying district."

They left. The room seemed very empty without them.

After a few seconds pause, Hugh rose and walked over to the nearer of the two brief cases. He tried unsuccessfully to lift it to a table. Finally, he gave up and loosening the straps, opened it on the floor. He blinked, reached in and withdrew a small bar of heavy yellow metal and carried it over to George. "Looks like it," he said. "And there's lots more of these in there. You know, those Smith twins are pretty robust boys. Maybe it's all the energy they save by not explaining things. What's in the list?"

George unfolded the paper and they read with a growing feeling of bewilderment. The wants of the Smith twins were widespread to say the least. After finishing, they stared at each other. George with an expression of frank perplexity on his face, Hugh

with a look of growing disquiet.

"Five tons of coal, a sewing machine, a Jaguar sports car, ten flashlights, ten barrels of gasoline, a bolt of tweed, a television set, miscellaneous perfume, and all that other stuff. What do they want it for?" George asked querulously.

"I don't know, George, I don't know. But there's one thing I do know, and that is we should have asked one or two questions before they left here. And then we should have politely and firmly told them we have enough troubles, thank you, and we recommend that you try across the street."

"Are you nuts? If that's really gold, we are going to run up quite a score. At these prices they can drive me out of my mind with curiosity."

"George, they scare me. They're too big and strong. And they were so sure of us. How do they know we won't go south with the gold? For that matter, we didn't even say that we'd take the job. Let's pin a note on the door telling them their bags are down in the janitor's office and go hide somewhere for a few days."

George wasn't listening. He was dialing a number on his private line. "Reilly can take some of this gold and I think I know a few other birds who can handle the rest of it. You go out and get the stuff tested. Find out how pure it is and make sure it's gold all the way through—Hello, Reilly? This is Hanley, chum, and I think I

have a little business for you. Now listen."

Hugh shrugged and turned away from his partner, now deep in an animated conversation. George was probably right, a gold brick in the hand was worth any number of fears lurking around in the bush of conscience. He hefted the metal bar reflectively. It had a cold, slippery, fascinating feel.

The next several days passed in a hectic round. The metal was gold all right, nearly chemically pure, and George was busy day and night peddling it off through his various channels. Hugh was even busier, shopping around the city like a thousand housewives on a spree. The Smiths visited them every morning, bringing more gold and more lists. Any questions or hints of questions were studiously ignored. Hugh bought paintings, chemical apparatus, a wide variety of books, a complete collection of antique firearms, and hundreds of other unrelated things. Before the week was out, the small warehouse that he had rented was half full.

At length, the Smiths arrived one day empty handed. George's face fell at the sight, but Hugh felt a happy stir in his heart. Perhaps the Smiths were finishing up. Conversation confirmed his hope.

"We must leave the city very soon," one of the Smiths said. Hugh and George had never since the first day been able to straighten out which was

John and which was Jesse, and had compromised by addressing each as Mr. Smith. This had worked out well, as the Smiths never seemed to be in doubt as to which of them was being spoken to.

"But we still haven't been able to buy all the items on your lists," George protested. "I don't think that we will be able to in less than another week."

"That is of no matter. See that as many of the remaining items as possible are delivered today. This evening we will all go together to the warehouse. We intend to move our purchases tonight."

"Move them tonight! There must be twenty truckloads there. I don't think I can hire enough trucks between now and then for you to be—"

"We will handle the transport," he was interrupted.

George fought a valiant delaying action with no help from Hugh, but his clients were calmly adamant. However, when the Smiths told him that money still due from the sale of the gold could be kept, he stopped objecting and began to wholeheartedly suggest plans for speeding them on their way. The Smiths insisted that a rendezvous be set for all of them to meet before going to the warehouse. They then ordered that the watchman who had been engaged be dismissed immediately.

When they were alone, Hugh complimented George on a truly outstand-

ing display of avarice in action and went forth to push delivery on as many of the final purchases as he could.

They met the Smiths, as specified, at the office and then all traveled to the warehouse in George's car. The building was dark, the street deserted. Hugh meditated upon the wisdom of accompanying the Smiths to such a place. He pressed his elbow against the gun under his arm and was glad that foresight had prompted him to bring it, but he wished that foresight had told him to stay in bed with a sick headache.

They stood beneath a feeble light over the door of the warehouse while Hugh got out the keys. Without preamble, one of the Smiths pointed to a shadowy doorway across the street.

"Why are those men hiding there?" he asked.

Hugh quickly faced about. There was a sudden excited voice, and two men darted out of the shadows across the way. One turned and threw a glittering something that flashed through the dim light and then rapidly ran up the street after his companion. Hugh ducked and drew his gun, but the two disappeared down an alley before he could get off a shot. He thought of giving chase for an instant but decided that he did not want to play peek-a-boo up an unlit alley with any such citizens as those. Behind him he could hear George's excited voice.

"Perez's playmates!" he was say-

ing. "Hugh, I'd forgotten all about them! One of them threw a knife. Did you see that, Hugh? It only missed me by a hair. Why didn't you shoot him? Why didn't—"

"Calm down, George, they're gone." Hugh replaced his gun and picked up the keys from where he'd dropped them. "I think that we'd better get inside. I'm sorry, Mr. Smith, about this little scuffle. Just some business acquaintances who—" His voice died away. The thrown knife had not passed harmlessly by as he had thought. It was sticking out of the chest of one of the Smith brothers, buried nearly to the hilt. "Mr. Smith! Here, let me help you! George, take the keys and open the door. There's a phone in the office. We need an ambulance. Smith's hurt." Hugh moved to take the wounded Smith's arm.

"It is nothing." Both Smiths were regarding the knife without interest.

"Does it interfere with your movement?" the unhurt Smith asked.

The other moved his arms about. "No, not at all. Let us go inside. We can remove it there." George opened the door with shaking hands and then before his and Hugh's unbelieving eyes, the two Smiths walked unhurriedly into the building.

Hugh went ahead and led the way with a small pocket flash through the cluttered main room of the warehouse to the inner office. After hastily locking the outer door, George brought up the rear.

Once within the office, Hugh turned on the light and illumined the drab dirty room. The Smith who had been hurt was tentatively wiggling the knife in his chest as if to see how firmly it was stuck. The other Smith moved over so he blocked the view. His shoulders heaved. When he turned again, he had the knife in his hand and was wiping it carefully with a pocket handkerchief. There was no discernible expression upon either of the Smiths' faces. And worst of all, there was no blood, not anywhere. Glancing at George, Hugh could see that his partner was feeling fear for the first time.

"Is . . . is he all right?" George croaked.

"Yes," replied Smith. "Now we must make arrangements to go."

Hugh took a deep breath and thrust his feelings down with an effort. He wanted very much to see the Smiths go, he would be glad to help them accomplish any and all preparations.

"Here are your lists," he said. "All the checked items are out in the warehouse. If you want to inventory them, we can do it now. When are your trucks arriving?"

"We will not inventory them. We do not have sufficient time," replied the Smith who had the lists. He put his hand in his coat pocket and withdrew a shining instrument. "Do you have religious beliefs?"

Hugh and George looked their question.

"We will allow you a little time for any rites which you may wish to perform. Then we shall kill you."

Cold terror gripped Hugh's brain. The certainty came to him that he would die strangely and be nothing just as soon as the Smith with the vicious round shining thing decided that he had had enough time for prayer.

Suddenly there was a souging sound and the door disappeared. It didn't crumble or crack, it was just gone. Something flashed through the vacancy to bury itself in the opposite wall with a vicious thud. On the way it severed the arm of the Smith holding the weapon just below the elbow. The other Smith whirled to face this threat. He held a fighting crouch for a few long seconds and then straightened and dropped his arms resignedly to his sides. He mouthed some strange sounds to the darkness beyond the door. In answer, five men entered the room.

They were tall, like the Smiths, but they were completely bald and had a cast of features that was utterly different. The brows were indented, the chins sloping, and their noses so short as to be little more than a small protuberance with two round holes. Each wore a type of tight coverall garment. Hugh felt a wonder even through the terror that gripped him. These were not human beings.

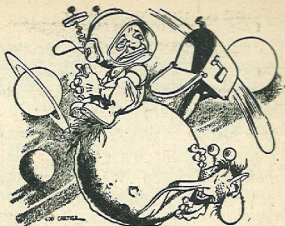
The two Smiths were efficiently

hustled into a corner of the room. They stood there side by side, facing the newcomers, a steady, slow, flow of yellowish fluid dripped from the stump of the Smith with the lopped off arm. As a final touch of horror, one of the coveralled beings looked around, picked up the severed forearm and courteously returned it, after having removed the weapon from the clenched fingers. The injured Smith nodded and took it in his remaining hand.

An entirely incomprehensible conversation between the Smiths and their obvious captors took place. Finally, in apparent response to an order from one of the strangers two of them stepped forward, reached up and incredibly began to peel off the Smiths' hair and faces. After the wigs and masks were gone, the Smiths stood revealed as members of the same race as the coveralled beings. Another order from the chief and one of the Smiths' captors left the room. He shortly returned with an apparatus resembling a small camera on a tripod. This was set up in front of the Smiths, and the strangers gathered behind it. One of them took notice of George and Hugh for the first time since they had entered.

"Turn around," he said in grating English. They did. Hugh was mildly surprised to find that his limbs obeyed him.

There was no noise but suddenly an odor filled the room, as if someone was baking potatoes and had left them in



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the oven too long. Hugh tried to pull his mind into a point, to think of nothing. He could hear the heavy breathing of George beside him, and with almost clinical abstraction began to count the number of his friend's almost tortured breaths. After a time that had no measure, one of the harsh voices commanded them again to turn around.

One of the beings was folding up the cameralike apparatus. In the corner where the Smiths had stood there was nothing. The dust on the floor seemed thicker than before. In another few seconds, Hugh knew he would break and bolt for the door. The chief stepped forward to stare closely at himself and George.

"We guard this system," he said. Then he turned and made a motion to the others. They walked out the door, quickly, but without haste. Possibly five minutes had passed since they first had entered the room.

George turned and was violently sick in a wastebasket. Hugh moved on stiff legs to the door and looked out into the dim cavern of the warehouse. Nothing moved. There was only the hodgepodge of the Smiths' purchases.

George recovered and came to join him at the door. "What happened?" he asked in a voice that was only barely under control.

Hugh took out and lit a cigarette, making all his motions with great care

as though the lighting of a cigarette was an important and delicate process. He inhaled deeply, without pleasure, and began to speak.

"Well, I think that the Smiths came from outside—way outside. They were probably a couple of sharpies, just like us, trying to hustle a fast buck or what passed for a fast buck with them and their kind. I guess they had a market for all that" —he gestured at the goods piled in the warehouse—"or maybe they were taking samples to see what might have a demand back home. Anyway, they hired us to get it together for them because we knew our way around. Then, just when they were ready to take off, those other birds came and called time on them. The Smiths must have broken some rules so they got . . . burned up or something."

"Who were those others?"

"You heard what that guy said. They 'guard this system.' I don't know if he meant solar system or star system or what. I don't know who put them here or why. I don't know whether they are supposed to keep things out, or us in, or both."

They stood silent and then with mutual accord started to walk. "You and I, George, are going to have trouble getting to sleep nights," said Hugh as they neared the outer door, "from now on."

They left the warehouse and started back to the city.

THE END



# THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

## LINES

Every now and then a meeting of the Pittsburgh Science Fiction Association blows up in a free-for-all wrangle over science fiction and fantasy. Does Bradbury write science fiction? Does Heinlein write? How do you define "fantasy" — does it have to involve the supernatural? Can anything be "supernatural"? If it exists, there must be a scientific explanation, mustn't there?

And so it goes. I understand it's a characteristic of science-fiction societies.

Now, in response to the column on

"Modern Science Fiction" — the book which has drawn two columns in succession in the New York Times Book Review's "Speaking of Books" — comes a letter from Ward Botsford of New York, musician and occasional writer, who protests the insistence on a line between s-f and fantasy, on science in science fiction. And to round the thing off, Liveright is reprinting Merritt in a series of big, two-novel omnibus volumes.

Somewhere in the *mêlée* is probably the question of a line between literature and entertainment, but let's table *that* one for a while.

It seems to me that there is no

answer, or, rather, that the answer is a purely personal one. As many another writer has pointed out, the question is: where do you begin to disbelieve? Or, turned around, how far can you suspend your disbelief?

Now, I have argued before that as a people — and even more so as a world of peoples — we have far more reason to believe in magic than in science. For millennia — whether as shamanism or systematized and purified in the world religions — we have been and still are brought up on the assumption that the so-called supernatural is real and present, that the arbitrary and unpredictable — save by a favored few — do and will always govern our lives. It is far easier to “see” a connection between some accident or clumsiness and a black cat or a broken mirror or the date, than it is to “see” a connection between turning a dial and seeing and hearing people thousands of miles away.

And, for that matter, unless you’ve had technical training in electricity of a specialized sort, you still have to be one of a “favored few” to predict what your TV set is going to do next and how to get rid of that picket fence.

To an extreme purist, who probably does not exist, science fiction would be fiction dealing only with known science. The story of a scientist’s life in our own times, such as Sinclair Lewis’ “Arrowsmith,” should fit this definition. Verne’s “Tour of the World in Eighty Days,” with its plot-saving

gimmick based on an astronomical fact which many people still do not know or understand, is another extremely elementary example of science fiction which requires next to no suspension of disbelief — unless you’re one of that benighted clan who find fiction of any kind “frivolous,” in which case you’re not reading this.

There are very, very few stories of this kind in the magazines today, and they are not very popular. Murray Leinster has done some little gems personifying existing machines, but nobody else seems to remember them.

John Campbell’s “The Moon Is Hell” might be taken to represent the next step. Here, except for the kind of luck which helped Wyss’ “Swiss Family Robinson,” are men forced to live off a Moon which is shown as it is — no puddles of liquid oxygen to breathe, no moon-lichens to munch, no mountains of ice to melt down into drinking water. Heinlein’s stories belong in this category, dealing with a world close to what we believe is reality.

Step by step we show our willingness to suspend our disbelief in more and more fantastic assumptions. For the sake of a story, we agree that men can breathe on Mars — that a spaceship can be maneuvered into hairpin turns — that telepathy exists and will be a common property of advanced races. (Here you are dealing with what many readers and writers consider pure fantasy.) Needless to say, time-travel stories continue to be popular if — by



every known tenet of present-day physics — impossible.

Coming in from the other direction, what about fantasy? Can we always identify it? Ghosts — oh, sure. Demons, called up by a spell — guess so. Elves and fairies — yeah; that's kid stuff anyway, although there are Padgett and Pratt and de Camp —

But what about Bradbury's Martians? What about Merritt? All right, *what* about Merritt.

For my money, A. Merritt did only one out-and-out fantasy: "The Ship of Ishtar," among whose characters are the Babylonian gods and goddesses. For the sake of argument, I'll give you two others: "Burn, Witch, Burn" and its sequel, "Creep Shadow," although what is shown as witchcraft there is suggested as an unknown science. "Seven Footprints to Satan" is a not-too-good crime story of the Sax Rohmer school.

But let's have a look at the two books which for my money are Merritt's best, and which are now out in a single volume: "Dwellers in the Mirage" and "The Face in the Abyss" (Liveright Publishing Corp., New York. 1953. 295 + 343 + 4 pp. \$2.75). I think you're cheating yourself if you've never read Merritt and don't get this book. The same publishers, by the way, earlier made an omnibus of "Seven Footprints" and "Burn, Witch, Burn" *without* the sequel to the latter — to which, they tell me, they

couldn't get rights.

"Dwellers in the Mirage" was the last of Merritt's "straight" lost-race novels and many readers find it his best and most believable. Leif Langdon and his Cherokee buddy, Jim Two Eagles, find a hidden valley in Alaska. The valley floor is hidden by a perpetual mirage — which I can very well believe, since just such a semi-permanent inversion layer is responsible for Pittsburgh's stalled air masses which promptly fill up with any smoke in these parts.

Living in the valley are two races: blond castle-dwelling barbarians out of High Asia, and troglodyte pygmies, the Little People, with their man-sized companion, Evalie. And there is Khalk'ru, the Kraken-god of the Ayjir — the Norse gods, the Aesir? — for whom the witch-woman Lur takes sacrifices.

Is this anything but pure fantasy, with its fairies, its witch, its devil-god, its ancestral memories? Where's the science in it?

Well, "lost" — which is to say, unknown or unvisited — tribes of some size and importance have existed and may still exist in remote places. As we will see next month, men of intelligence and education have believed and do believe that such people exist. There are pygmies — though they don't happen to be mongoloid — and may have been more of them in the past. And there is more than a suggestion that Khalk'ru is an other-

dimensional monster of a breed which is not only respectable but old-hat in other types of science fiction.

With "The Face in the Abyss," my own favorite of all Merritt's tales, there is far more reason to insist on pure fantasy. There is the Face itself, a colossal, evil mask weeping tears of molten gold. There are invisible flying serpents. There are miniature dinosaurs, spider-people, frog-women — and the Snake Mother, half woman, half serpent. There are forces and weapons and instruments which surely have no parallel in our science.

But it is the premise on which the story is built that these races, and their science, *did* once exist and had survived deep in the Andes. Surely Adana, the Snake Mother, is no stranger than any of E. E. Smith's alien Lensmen. The forces she commands are no more fantastic than those Kinnison and his cohorts slap around.

We dub Merritt "fantasy" because he tells his story with color and romance, in an atmosphere of dreams, and because by this time we are fairly certain there are no more lost valleys where such marvels could lie hidden. We do it because he deliberately and skillfully wove the storyteller's spell over his rather threadbare plot and characterizations — because he chose to make an emotional appeal rather than an intellectual one. For the same reason, now that we know what Mars is really like, we shrug aside Ray

Bradbury's Mars as a poetic impossibility — not because it is any more impossible than the stereotypes of the usual, acceptable space-opera, but because Bradbury's appeal is again an emotional one.

Since the first storytellers gathered an enthralled audience around a fire in a cave-mouth, and filled the outer darkness with marvels and horrors, we've loved being fooled with the magic of words and tangled in the net of spells they can weave. We still do: as witness the thousands and millions of us who believe implicitly in the formula of the western story, of the radio soap-opera, of the private eye whodunit.

But science fiction is supposed to be a literature of science, of hard reason, and we're suspicious of word-weaving. Lord knows there's nothing with less magic in it than the text of the usual scientific paper!

Let's stop fooling ourselves with the idea that good writing — moving, spell-casting writing — must mean that a story is fantasy. Remember that scientists can and do, if rarely, write as well and as emotionally as William Beebe and Rachel Carson. Draw a line if you must, but draw it according to how far you can suspend your disbelief, whether that rules out ESP and time travel for you, or Martians, or whether you're willing to go for levitation, Atlantis, and intelligent bees in flying saucers.

In the long run, you're going to

remember any story because of how well it was told — *as a story*. If you believe “Brave New World” and “Nineteen Eighty-Four” and “Limbo” are prophecies and warnings, go and do accordingly — but why mix that element up with their quality as fiction? And if Merritt can weave a spell which makes us believe there can be lost races, and Bradbury makes us momentarily believe in Ylla’s beautiful, sad Mars, aren’t we the gainers for their ability to move us? I know I am.

---

**BEACHHEADS IN SPACE**, edited by August Derleth. Pellegrini & Cudahy, New York. 1952. 320 pp. \$3.95

“Beachheads in Space” is one of the books which was somehow lost between moves when I came to Pittsburgh last year and finally picked up when I found a copy in a local bookstore *after* I’d received its successor—which will be under fire next month. It should be more popular than the last two Derleth anthologies with their scholarly recapitulation of science-fiction history.

This is a well-done theme collection of fourteen stories, none older than 1940—with one exception. The theme: various aspects of the contacts between mankind and other races in the depths of space and right here on Earth. Excerpts from current books and magazine articles set the mood for each story.

Dr. David H. Keller opens the book with “The Star,” written especially as a prologue to the collection: it shows mankind as one among a multitude of races, and a threat to the security of Galactic civilization—not a rare theme, these days, but treated in typical Keller manner.

Jack Williamson’s “The Man From Outside” tells the same story in another way. Clifford Simak’s “Beachhead” gives a whiff of the alien smell of man’s first stranger-planet. And in “The Years Draw Nigh,” Lester del Rey has told a moving little story of how man may recoil from the stars—one of the top stories in any collection, as is the one which follows it, Eric Frank Russell’s oft-reprinted “Metamorphosite” with its tight plot and superb last line.

But not all is moving and serious among the worlds, for the comedy of space is in the hands of L. Sprague de Camp with “The Ordeal of Professor Klein” among the inscriptions of Gdoz—minor, but very neat. This section, “Exploration,” closes with one of A. E. van Vogt’s problem stories, “Repetition”—men against a world.

The second part of the book deals with invasion of Earth. Isaac Asimov’s “Breeds There a Man . . . ?” is a variant on the Fortean “we’re property” theme. John Beynon Harris’ “Meteor” is an exercise in relativity, somehow not as effective as it might be—or as it was the first time. John

Wyndham's "And the Walls Came Tumbling Down," on the other hand, is much more successful in getting across an alien point of view. Donald Wandrei's "The Blinding Shadows" is the one real old-timer in the book (1934), and its age does somehow show though it was a topper in its time. Clark Ashton Smith's "The Metamorphosis of Earth," though of 1951 vintage, also seems dated and lacks the condensed color of many of Smith's best tales.

Finally, in Kendell F. Crossen's "The Ambassadors from Venus" there is a wry reminder that man is by no means the supreme animal, and as an epilogue we have Nelson Bond's excellent little variant on the Fourth Chapter of *Genesis*, "To People a New World"—among *his* best.

Verdict: better than anyone would have thought could still be dredged out of the old files.

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**THE SPACE MERCHANTS**, by Frederik Pohl and C. M. Kornbluth. Ballantine Books, New York. 1953. 179 pp. \$1.50; paper 35¢.

For its second venture in modern science fiction, Ballantine Books has chosen a novel which many will rate as the best of the year. Following the Ballantine plan, editions printed from the same plates are cloth-bound at \$1.50, paper-bound for thirty-five cents. Both are pocket-size with a striking cover or jacket by Richard

Powers.

Completely revised since it was serialized as "Gravy Planet," this story of an unspecified future is in the tradition of Huxley's "Brave New World"—not so brilliant, but more consistently worked out and suffering principally, it seems to me, from its concessions to melodrama.

The first third of the book, up to the point when copysmith Mitchell Courtenay chases his double-crossing colleague up an antarctic glacier and is shot down, is pure, subtle, driving satire on modern advertising as good as anything in "The Hucksters." Here we have a world in which Advertising has completely taken over. Natural resources are exhausted: food comes from *Chlorella* tanks and synthetics, and from the massive, ever-growing tissues of Chicken Little. There is no more petroleum, so people ride pedal-cars or walk. There is no housing, so the well-off live in single-roomed collapsible apartments, the consumers—white-collar as well as laborers—sleep on the stairs of the great Agency buildings. Production has been diverted from necessities—which would have to be sold at medium prices—to luxuries, and a fantastic webwork of sales and propaganda erected to force these unessentials on a regimented public.

Courtenay, who tells the story, is elected by the boss of Fowler Schocken Associates, world's biggest advertising agency, to sell Venus. Schocken will

literally own the planet, once Courtenay can get consumers there: nothing can be bought or sold there without a profit to Schocken. And it is in the picture of things that Courtenay, as an advertising executive, considers right and normal in his society that "The Space Merchants" shows its teeth. That coffee is doped with a "harmless" alkaloid, so that drinkers must keep on drinking—that "Kiddie-butts" have added billions of young children to the cigarette market—that advertising is forced on every consumer, every minute of the day—that a thousand other things which tell us a great deal about Copysmith Courtenay and his times.

But Courtenay runs into trouble. His conditional wife doesn't like the conditions. There is a double-crosser in his organization. Someone is trying to kill him, without first having filed Notification of a legitimate business feud. And after the episode on the glacier, he wakes up with a false name, a false identity number, and a job as a scum-skimmer in the *Chlorella* algae farms of Costa Rica. Being an aggressive executive type, he resents this consignment to the consumer class, and with the aid of the Consies—the World Conservationist Association, which has replaced the Communist Party as the principal underground—works his way back to his former position and the unraveling of the puzzle.

And here, it seems to me, "The

Space Merchants" loses the way and remains minor-league literature—"mere" science fiction, though of the very best. For the whole story is told by Mitchell Courtenay after he has been through his purging and seen both sides of the coin, and with this knowledge and experience he could not possibly have maintained the naivety and single-mindedness of the first part of the book. There must have been some "had I but known" taint to creep in.

Or is Star-Class Copysmith Courtenay writing these memoirs with the advertising copywriter's consummate art, to convince his wife of his change of heart? Is he still, by nature and nurture, the heir-elect of Schocken Associates who will find a way to trip up B. J. Taunton and his Brinks bodyguards and get back in control of the "gravey planet," Venus?

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AGAINST THE FALL OF NIGHT, by  
Arthur C. Clarke. Gnome Press, New  
York. 1953. 223 pp. \$2.75

It is hard to believe that the same man who has written the almost factual "Sands of Mars" and "Prelude to Space" can be the author of such poetic visions of the far future as "Against the Fall of Night."

This is Earth of a billion years hence. Man has shriveled into two isolated colonies—the city-culture of Diaspar and the pastoral folk of Lys—unaware of each other, and unin-

terested in looking beyond the bounds of the known, into the truths behind their legends. Then a boy of Diaspar, Alvin of Loronei, begins to wonder and to probe—

“Against the Fall of Night” is the simple story of Alvin’s quest for his people’s great past. It takes him into the bowels of his city—to lost Lys—to the mythical fortress of Shalmirane with its strange robots—and at last among the stars to the truth.

In some ways this is an old-fashioned little story, quite without the wheels within wheels within wheels which have become the trend lately. But because it is so well told, the story becomes convincing and its magic spreads over the reader as well as the people of the plot. For the simple fascination which this kind of science fiction can bring, “Against the Fall of Night” is recommended.

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**SECOND STAGE LENS MAN**, by Edward E. Smith, Ph.D. Fantasy Press, Reading. 1953. 308 pp. \$3.00

Sad to say, Doc Smith’s sagas of the Lensmen are slowly but inevitably approaching their grand finale. There is but one volume to go after this—“Children of the Lens”—although Fantasy Press reports that the old world-wrecker is at work on a new cycle of yarns dealing with Kinnison’s universe and recalling some old pals, Worsel of Valantia and a newcomer, Nadreck of Palain.

I may be wrong, since my ASF files are in storage, but it seems to me that Nadreck has been added to the cast of Lensmen and some episodes in which he is important have been added to the plot since “Second Stage Lensman” first was serialized here in 1941–42. He is especially well fitted to cope with those nasties from away back, the Overlords of Delgon and the Eich, who reappear behind the scenes of the present action.

Again it is Kinnison and Civilization against Boskone. This time we are treated to some new characters—the beautiful but deadly matriarchs of Lyrane, the glamorous Illona of Lonabar, and the vicious Alcon, Tyrant of Thrale. Clarrissa MacDougall becomes the Red Lensman—Kinnison becomes a tyrant on-the-make—Worsel mops up another lot of Overlords.

Who needs to describe a Lensman yarn? It’s space opera to the nth degree, by the man who invented space opera, polished and repolished. You either like it a lot—though you probably won’t believe a word of it—or you can’t stand it at all. I hope by this time you know which camp you’re in.

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**THE CONTINENT MAKERS**, by L. Sprague de Camp. Twayne Publishers, Inc., New York. 1953. 272 pp. \$2.95

This collection is subtitled “And

ASTOUNDING SCIENCE-FICTION

Other Tales of the Viagens." Included are seven short stories—three from this magazine—and one short novel, the title story.

It should be no news to ASF readers that the Viagens stories deal with a future—dated here between A.D. 2054 and 2153—in which a dominant Brazil conducts interstellar commerce among the planets of various stars, and particularly with Vishnu, Krishna and Ganesha of Tau Ceti, Osiris, Isis and Thoth of Procyon, and Thor of Epsilon Eridani. In this broad setting there is ample room for swashbuckling, skulduggery and horseplay, in which de Camp deals deftly from time to time.

Out of this setting, on the other hand, has come just one really memorable book—"Rogue Queen." That is in a class by itself. Here you will find entertainment, ideas skillfully played with, precise care for detail and consistency, but actually not too much plot-suspense. So logical is the development of most of the stories, that the experienced reader knows what must be coming next.

The collection opens with "The Inspector's Teeth" and with an Osirian dinosaur enrolled as a freshman at Atlantic U. and pledged to Iota Gamma Omicron. In "Summer Wear" a fashion sales agent mixes with an equally unscrupulous rival, subjective time, and Hollywood fashion-proneness.

"Finished" introduces the problem

of keeping the highly alert Krishnans from out-world inventions and mixes in the affair of the Sotaspean mummy. All good fun, which you probably remember well.

"The Galton Whistle"—originally "Ultrasonic God"—takes us to Vishnu for a brush with the centaurs native to that planet.

Two of the stories deal with that interstellar sharp-practicer Darius Koshay, of whom I should like to have heard more. His goal in life seems to be getting around the regulations of the Viagens and profiting thereby. In "The Animal-Cracker Plot" he is on Vishnu, dealing deftly in magic. In "Git Along!" he becomes one Moritz Gloppenheimer, establishes a dude ranch on Osiris, and comes about as close to his comeuppance as at any time in our acquaintance. Meanwhile an equally larcenous individual by the name of Felix Borel has involved himself on Krishna in the affair of "Perpetual Motion," the fascinating Zerdai, and the embarrassing rules of the Order of Qarar.

Although it fits into the same scheme of things, you may feel cheated to find that the title story, worth about one quarter of the book, takes place back on Earth. There are various aliens involved in the events which surround an attempt to create a new continent in the South Atlantic—an ostrich from Thor, a beautiful Krishnan tourist, an Osirian reptile with a Thothian pet—with a

grand climax on Ascension Island.

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**FUTURE TENSE**, edited by Kendell Foster Crossen. Greenberg Publishers, New York. 1952. 364 pp. \$3.50

This is one of the anthologies which missed connections with me when I moved to Pittsburgh last summer, and a good one, too. Only seven of the stories are reprints; the other seven are published here for the first time.

"On the record," the first section of the book, opens with Peter Phillips' "Plagiarist," a touching yet not quite convincing tale of the boy in a fossilized future era who discovers the forbidden and forgotten past. Anthony Boucher contributes "The Ambassadors," a delightfully tricky little item which bridges fantasy and science fiction, and Henry Kuttner, in "Dream's End," takes us grimly into the depths of psychosis where fantasy and reality merge.

From Ward Moore, in "We the People," we have a neat little satire of a Presidential year in the far future, with the nip in the fourth line from the end, and from Miriam Allen de Ford, with her "Throwback," comes a discomfiting little story of one woman's revolt against regimentation. Crossen's "Things of Distinction" is a joyous foolery of interstellar sharp trade, and the section closes with one of the most haunting of C. L. Moore's Northwest Smith fables, "Scarlet

Dream."

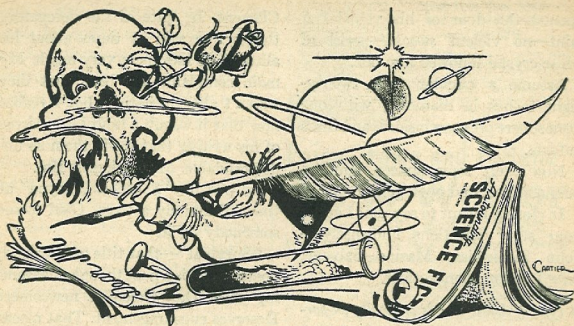
"Off the record," picked up from the discard heap or written for the book, isn't quite up to the level of the editor's selections from the past. H. F. Heard, in "Cyclops," has a talky variation of what the sleeper sees when he awakes in the far future. Bruce Elliott's "The Battle of the S. . . . s" is a farce-comedy of the film industry's future, and Martin Gardner—whose "No-Sided Professor" seems established as a mathematical classic—has another go at topology in "The Island of Five Colors" with the eminent Professor Stanislaw Slapenarski.

"Baby Killer," by Rose Bedrick Elliott, is a very short tale of the way a world defends itself against Man. James Blish, in "Beanstalk," gives us a bitter novelette built on Man's inhumanity to the fruits of his own tamperings with his genetic line.

Finally, John D. MacDonald—who adds up as one of the most versatile young writers to try his hand at science fiction—in "Incubation" offers another unpleasant variation on the dismal end-in-itself of a Conformist society, and Christopher Monig, with "Love Story," closes the book with one of the oddest and most original of the lot—the story of what happened a lifetime after the children of America rose in arms and destroyed the adult world.

One of the best of the anthologies I've seen in the last year.





## BRASS TACKS

Dear Sir:

**SUBJECT:** The very interesting  
"MISSION OF GRAV-  
ITY."

**QUESTION:** A slight oversight—  
or am I just not as-  
suming enough?

Briefly,

Flyer Lackland is down in Mesklin to salvage a valuable remote-control rocket which failed to heed its "return" call.

Accidentally stranded in a heavy armor under three gravities, Lackland says, "... If there was ever born an Earthman who could walk eighteen miles . . . I'm certainly not the one. My air will last indefinitely with these

alga gills . . . but I'd starve to death before I made the station." Eighteen hours later he is back at station.

Eighteen hours under three atmospheres normal Earth air requires a very definite step-by-step decompression period—running into hours depending on amount of exertion, water temperature (air temperature) or cramped position.

If that "alga air" is pure oxygen, our hero is in for a lovely case of oxygen poisoning.

Let's assume Lackland's station, suit, and tank are all one Earth's atmosphere (app. 14.7) pressure stressed. Quote from pages 39, 42.

"Closing his helmet, Lackland

opened the door of his vehicle. A faint—no violent *swoosh!*—swirl of white crystal followed him out.”

Assume a circular door twenty-eight inches in diameter, with one atmosphere pressure inside—and three outside.

Now exert some sixteen hundred pounds force, and open gently.

In closing I want to say that I enjoy your story selections immensely.—John Zieniewicz, Marine Salvage, New London, Connecticut.

*A type of detail that is critically important to a marine salvage effort! Naturally, Zieniewicz would spot it!*

---

Dear JWC:

“Enough Rope” is clearly the best story in the July issue. It tickled me all over. And it’s good to see Wing Alak again. This series should certainly be continued! By all the gods, I swear I’ll give up my subscription if you don’t do all you can to keep it going. No, that’s a little exaggerated; but I certainly love the Anderson model of the Galactic Patrol. Highly valid, as well as great fun; far better than the somewhat similar “Bureau of Slick Tricks.”

The final instalment of “Mission of Gravity” comes in for second place. The gravity research is left pretty vague, but that’s not too bad with the story as “Mesklinocentric” as it is. The humans in the story are almost entirely in the background; typical of

Clement. In spite of the derogatory things I’ve said at times about his aliens, I do like them very much. My main complaint had been that they weren’t alien in nature; but I realize now that it wasn’t a fault but a virtue of his writing that made them so understandable. My apologies, Hal.

I’d put the “Solution Delayed” at third. Definitely a twist. Glad to see somebody do it.

“Survival”—that title gets around, doesn’t it?—is a neat though unassuming yarn. Don Green—a newcomer? Deserves encouragement. That attention to exact detail is very welcome.

Editorial—always the first thing I look for when the magazine comes—as interesting as usual. It has the flavor of a personal conversation, and editorial personality comes through clearly and strongly. This monthly glimpse is rather frustrating; it always makes me wish I knew you personally. But we can’t all be chummy with the editor, and there are worse frustrations than *that* one.

On the switchover in scoring—I can’t offhand remember what it was, and all my back issues are packed away preparatory to a cross-country move. As I recall, it was O.K.; but how about giving a resumé for the benefit of those who don’t remember, or didn’t see, the original explanation?

Uh, look. Now I have something to say which isn’t nearly as complimentary as the above, but it needs saying. **WHAT** in the nine planets and twenty

moons is wrong with your artists? Or do you really like that stuff? I know for a fact that one of the authors—Anderson—could have done a better job illustrating his story. Orban is still fairly good, especially by comparison; but van Dongen is not living up to his earlier promise at all. Miller and Dreany are just plain clumsy. Can't you do something about it? Oh, well; in relation to what I see in other mags whose names I needn't mention, your illustrations are models of clarity, decorativeness, and appropriateness.

Some random gripes: Is Isaac Asimov ever going to write another Foundation story? Is van Vogt going to write *anything*? How about talking de Camp into another Viagens Interplanetarias, preferably on Krishna? A sequel to "The Specter General" would be welcome, too. I'm sorry to see the "Astounding" part of the title played up again, but I can understand the need to distinguish between magazines on a newsstand. Ye gods, does EVERYBODY use that format? As a subscriber, I didn't realize at first what the situation was. But I wish you could do something about that title, I really do.

Ah well, whether you even read that paragraph or not, the magazine will continue to be my favorite. It could be better but it could also be a lot worse.—Karen Kruse, 7415 Piney Branch Road, Takoma Park 12, Maryland.



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*To have a continuing art program, we must continue to try new artists as we try new authors. The readers' reactions are the final determinant; I am aware that I, too, can reject the new-and-good through unwarranted stuffiness. So I do have to try some things I do not feel sure are good!*

---

Dear Mr. Campbell:

So much discussion has been going on about this business of social lag that I don't think it would hurt things any if I threw myself in this *pot pourri*.

I would like to submit the proposition that the social lag is *not* the cause of the present turmoil in the world. And my reasons for saying so are as follows:

1) In the first place, technology and the physical sciences *were bound* to become more developed than the social sciences. The former's advancement over the latter's was inherent in the structure of geological and animal evolution. This planet came to possess abundant and varied raw materials. And Man was structurally adapted to use them. Had Mother Earth not been so generous in her provision of raw materials, and had Man been constituted in a different way, physically—lack of forefinger and thumb, let us say—then very likely he would have turned to the cultivation of mental faculties, and thereby have produced a culture with the emphasis in psychology, sociology, and parapsychol-

ogy.

2) Man is complex. Stars and atoms are complex too, but extremely less so, and in a different sense. Otherwise how account for the fact that astronomers have built a complete scheme of stellar evolution, while the psychologist is still unable to answer such an apparently simple question as: "How do we think"?

3) If the social lag were really the cause of our troubles then it would be quite reasonable to assume that each new discovery in the fields of sociology, psychology, and parapsychology would effect a corresponding cure for our social evils. Of course, such is not the case. Mountains of books are written on social problems and their corresponding solutions, not to say psychological and parapsychological discoveries and theories. But none of this literature—as brilliant as some of it may be—has ever been applied to social ills.

4) Perhaps the fault lies in the lack of application of proposed solutions and theories. That may well be, although, for myself, I believe that this matter is of purely secondary importance. When a man is confronted by a problem it is extremely unlikely that he would say: "Well, let's see now, according to Professor Noodle's theory I should follow course A, supplemented by sub-course X-109. But if this produces the N-340 variation from the mean, I should—" Well, anyway, a man just doesn't think like that—no

matter how much of a theorist he may be.

5) Instead, I would suggest that readers of Astounding turn to a story that was written six years ago by Jack Williamson. He had quite a remarkable concept in his tale: "The Greatest Invention." The greatest invention cured social ills by *eliminating the reason for their existence*. The reason for social ills was the mutual interdependent structure of society. The greatest invention did away with the ills by destroying the structure, *ergo*, made each man dependent upon himself for the production of whatever goods he wanted.

And what was this Greatest Invention? It was *power*—something which Man had all along. The only difference was that power or energy was available in an unlimited quantity, and it was available to *each* man by virtue of being portable.

I would close with the statement that it is easier to apply scientific theories to technology than to sociology. The number of political systems is limited, but the number of technological applications is not. You cannot put a human being in a nice compact equation as  $E = mc$ —even though the human being can, himself, produce even more powerful results!—John D. Grey, 1014 West 140th Place, Los Angeles, California.

*But making the problem a bit tougher is this factor: each man wants power all*



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right—but he wants the power so that he can do that which, in an undisturbed universe, he specifically could not do. Williamson's greatest invention actually did not solve the sociological problem—it ducked it. "Let's all be hermits" isn't a solution. The "Back to Nature!" advocates have a way of escaping the problem too—but it's not a solution.

It's necessary, however, to solve it, not duck it. Reason: Somewhere, some group is going to do so. That group will, like the early mammals, be the progenitors of the future world-dominants. We can, if we like, follow the Good Old Way, as did the saurians. They didn't think the problem worth solving either.

The problem: How can Man live with and work co-operatively with Man?

---

Dear Mr. Campbell:

I think you might be interested in knowing that at KROD-TV we have initiated the premier television series on the conquest of space. Enclosed is a program guide which will give you some idea of the scope and the distinguished participation in the series. We are now in our fifth week and the local response has been excellent. Our proximity to such government installations as the White Sands Proving Grounds, Holloman AFB and Fort Bliss offers us unlimited personnel and equipment for the series. The title, "Frontier To Space," is truly

appropriate as this old western frontier country is now one of the focal points of interplanetary research.

The immediate local response—we cover three states—has brought us to contemplate national distribution. We are a CBS affiliate but not yet on the cable and not a "feedback" station. However, we are convinced that if national interest warranted it, we could get network or foundation underwriting for filming the series. Therefore I respectfully solicit the comments of your staff and your readers. It is my conviction that "Frontier To Space" could become the most informative, provocative and entertaining program on television.

As you can see the program undertakes the whole story of rocket travel, beginning with the history and fundamentals and moving on to the latest accomplishments and speculations. With the co-operation of the government we are bringing actual rockets and cutaways into the studio. Also we have a large library of recently declassified films at our disposal. We have some of the most brilliant scientific minds in the world co-operating with us. We think we have something the whole nation should see. What do you think?—Paul Rader, Prod-Dir, FRONTIER TO SPACE, KROD-TV, El Paso, Texas.

*It's becoming more evident than ever that simple space-travel discussions no longer constitute science fiction!*

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Dear Mr. Campbell:

I note that in the letter section of your magazine mathematical puzzles of various kinds appear and wonder if you or some reader could supply the answer to one that has annoyed me for some considerable time.

Given facts are as follows: Immediately after the war, a part of the British army of occupation is stationed by a town. The rate of exchange of the mark is altering rapidly, and at this time the mark is not worth exactly the same in relation to the pound in the troops canteen as in the town. In the canteen forty marks are received for one pound, in the town forty-two are received for one pound. One drink costs one mark in both places. A soldier, thirsty, but hard up, pawns an article to a friend for one pound, goes downtown, has one drink, and receives forty-one marks change. He returns to the canteen, has one drink,

changes his remaining forty marks for a pound, and goes back to town. He repeats the process until he has had as much as he can hold, goes back to camp and redeems the pawned article with the pound received from the canteen after his last drink, and proceeds to sleep it off. Question: who paid for the drinks?

Also, may I take this opportunity to congratulate you on the improvement in your magazine over the last few months: previously I was finding about one good story to an issue. I myself would like to see a few stories of the "space-opera" kind, but one can't have everything. I should like, however, to emphasize that, while science fiction is rapidly growing into a literature, there is no need to publish stories comparable to the English literary classic.—C. B. Cach, Box 201, Christchurch, NEW ZEALAND.

*Well, how about it, you economists?*

Possibly the precocity index type of intelligence test is inappropriate to anything but a perfectly homogenous population—and the human population isn't homogenous by any manner of means.

Let's examine what that IQ test system actually determines.

As a child goes through the years, he acquires more and more data and understanding. We could make a series of successive tests on one individual, A, and determine that he was acquiring data and understanding at a rate of, let us say, one hundred units per year.

Examining another individual, B, we could find that he was acquiring understanding at a rate of one hundred ten units per year.

What we're plotting here is the *rate* of learning.

We can now say that B shows a rate of learning 1.1 times that of A; at any given stage of their development, B will have 1.1 times as much achieved understanding, *if* this rate continues.

The psychologist measuring IQ's is actually measuring the ratio between the achieved understanding of one individual, and the achieved understanding considered to be normal.

But it is recognized that the rate of learning does *not* continue steadily throughout life; it levels off as adulthood is approached. There are, then,

two factors involved; the rate of learning, and the final integrated total of learning.

It may turn out that A, above, continues to maintain his rate of learning for thirty years, winding up, at thirty, with three thousand units of understanding. While B, although learning at a higher rate, continues the process for only twenty years, and levels off at that point. His net integrated understanding will then be twenty-two hundred units.

Or we might find an individual, C, who learned at a rate of one hundred ninety units a year—for twelve years. He'll wind up with two thousand two hundred eighty units of total understanding.

Finally, we can imagine an individual of a nonhuman species who learned only at the rate of twenty units a year—a moronic creature. But it happens his lifespan is ten thousand years, and he goes on learning for four thousand years, reaching a net understanding level of eight thousand units!

Now using the rate-of-learning index, which the present IQ actually is, we would conclude that C, with a rate of one hundred ninety, was a high-grade genius—while A, with his one hundred units was barely average. But in adult life, we'd find A running the place, while C was keeping the company's books.

We'd find John Stuart Mill doing essentially clerical work for the East India Company, and Copernicus re-



organizing human understanding of the Universe in his off moments, while running major affairs of his country, practicing medicine, and handling the affairs of a cathedral.

It's not merely how fast an individual learns—it's how long he can keep it up!

There also seems to be another factor at work here. Physiologists have found that if a pig is fed on copra, it will gain weight at a furious rate. But on being slaughtered, it is found that the pig's layers of fat *are not lard*—are *not* of the chemical composition typically normal to the pig. They're layers of unaltered coconut fat! The fat of the coconut has not been digested, absorbed, and made part of the pig's metabolism; it's simply been laid down unaltered.

There are stage performers of the "Mr. Memory" type who demonstrate that they have memorized the Encyclopedia Britannica, and one thousand three hundred sixty-two and one half other reference books. They can spout facts almost endlessly. But

the facts aren't theirs; like the pig, they've glutted themselves on fat facts, and never digested them, never made the facts part of themselves.

Facts can be stuffed into a child the way copra is stuffed into a pig. The facts can later be recovered unaltered.

A magnetic tape recorder is even better at that; it doesn't alter facts fed into it at all!

If the IQ test is designed to test for fact-storage, two entirely different effects may be present.

1. A high score can be made by an individual who has been well stuffed with remembered facts. The Mr. Memory type.
2. A high score can also be made by an individual who has digested and appreciated a great deal of information. The true thinker type.

But testing for fact-content of the mind will not distinguish these two types.

However, the rate-of-learning test usually *will* distinguish. It's much faster to simply store the facts unaltered; an individual can learn to

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repeat by rote, like a magnetic tape recorder, far faster than he can learn to understand and integrate data. Hence the rate-of-learning test will favor the fact-stuffer over the analytical-understander.

It is possible, of course, for an occasional wildly high-level genius to be able to actually absorb and digest facts as rapidly as the ordinary fact-stuffer can accumulate them. Unfortunately, this type is apt to learn, early, the understandings his teachers have missed, and, like Galileo, get into constant trouble with them. He's busily comparing—digesting—facts his teachers merely memorized, and finding that the "facts" don't work. The result is that he will show up poorly in a fact-test type of examination; he's discovered that so many of the "facts" aren't facts.

In Terman's "Genetics of Genius," the conclusion was published that the IQ test did, in fact, indicate that a high IQ in childhood correlated with eminence in adult life.

I'm afraid that's a "fact" that isn't a fact—on the basis of Terman's own data. The eminence of John Stuart Mill definitely does not approach that of Copernicus, Newton, Galileo, da Vinci, and the many, many others that, in Terman's opinion, showed a far lower IQ.

I'm afraid I don't know how one would test for true ability to achieve in adult life those things which lesser

men cannot accomplish. But after observing the peculiarities of the IQ concept, I'm convinced that there is no engineeringly usable correlation between IQ and achievement ability.

The subjective test of an interview is the test that works—but it's an art, not a science.

Terman's book is a quarter of a century old; much work has been done since. But the IQ is still being rated on the basis of the precocity index—which Terman's book, it seems to me, suggests is patently false.

We don't want neurotic, bedeviled, unhappy quasi-clerical men like John Stuart Mill as the ideal of human intelligence. Any consideration, any testing concept, which allows such an individual to take first prize had best be rejected, and hurriedly.

I'd prefer to be of the IQ 105 type—a Copernicus, busy, happy, broadly active in a dozen fields, successful in all, creating a whole new cosmology as a hobby project!

Or a lowly 120, like Newton. Or a Leonardo da Vinci, no genius by IQ standards, but a man who lived a long, vigorous, active life, full of great achievements, and great fun.

At age seven, I'd prefer to play a good game of hide-and-seek rather than reading Plato in the original Greek. With that as our cultural ideal, we might get more Leonardos and Copernicuses, even if we did run short of John Stuart Mills and infant prodigies.

THE EDITOR.

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—continued from back cover

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