CCC

SCIENCE FICTION

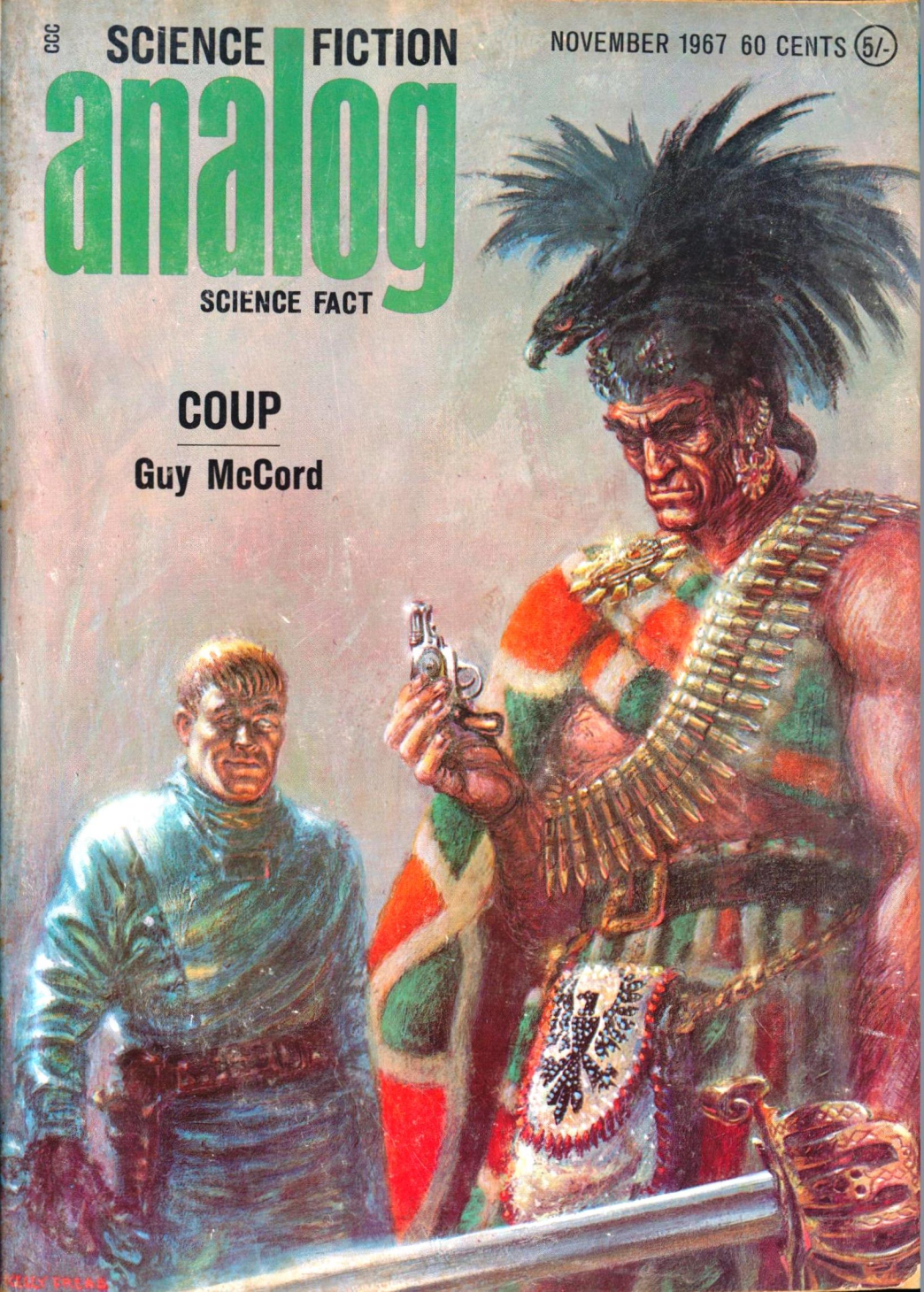
analog

SCIENCE FACT

NOVEMBER 1967 60 CENTS 5/-

COUP

Guy McCord



To people who have always meant to own

THE WORLD OF MATHEMATICS

The famous four-volume library edited, with commentaries, by James R. Newman (over 100,000 copies have been sold in the original hard-bound edition currently priced at $25) is available *complete and unabridged in paperback — four volumes, boxed, at only $9.95.*

Partial Contents

GENERAL SURVEY — Jourdain: *The Nature of Mathematics.*
HISTORICAL AND BIOGRAPHICAL — Turnbull: *The Great Mathematicians;* Newman: *The Rhind Papyrus;* Plutarch: *Archimedes;* 12 others.
ARITHMETIC, NUMBERS AND THE ART OF COUNTING — Archimedes: *Poppy Seeds and The Universe;* Ball: *Calculating Prodigies;* Newton: *The Binomial Theorem;* 6 others.
MATHEMATICS OF SPACE AND MOTION — Clifford: *The Science of Space, The Space Theory of Matter;* Euler: *The Seven Bridges of Konigsberg: A Famous Problem.* Kline: *Projective Geometry;* 7 others.
MATHEMATICS AND THE PHYSICAL WORLD — Galileo: *Mathematics of Motion;* Moseley: *Atomic Numbers;* Boys: *The Soap Bubble;* Mendel: *Mathematics of Heredity;* 18 others.
MATHEMATICS AND THE SOCIAL SCIENCES — Malthus: *Mathematics of Wealth;* Richardson: *Statistics of Deadly Quarrels;* Hurwicz: *On the Theory of Games;* 7 others.
THE LAWS OF CHANCE — De LaPlace: *Concerning Probability;* Peirce: *The Red and The Black;* 5 others.
THE MATHEMATICAL WAY OF THINKING — Peirce: *The Essense of Mathematics;* Mach: *The Economy of Science;* 3 others.
MATHEMATICS AND LOGIC — Boole: *The Mathematical Analysis of Logic;* Nagel: *Symbolic Notation;* 3 others.
THE UNREASONABLENESS OF MATHEMATICS — Kasner and Newman: *Paradox Lost and Paradox Regained;* Hahn: *The Crisis in Intuition.*
BECOMING ONE'S OWN MATHEMATICIAN — G. Polya: *How to Solve It* (excerpt).
THE VOCABULARY OF MATHEMATICS —Kasner and Newman: *New Names for Old.*
MATHEMATICS AS AN ART — Sullivan: *Mathematics as an Art.*
VARIOUS CLEVER MACHINES — Von Neumann: *Theory of Automata;* Turing: *Can a Machine Think?* Shannon: *A Chess-Playing Machine.*
THE UNGENTLE USES OF MATHEMATICS — Lanchester: *Mathematics in Warfare;* Morse and Kimball: *How to Hunt a Submarine.*
A MATHEMATICAL THEORY OF ART — Birkhoff: *Mathematics of Aesthetics.*
MATHEMATICS IN LITERATURE—Swift: *Cycloid Pudding;* Huxley: *Young Archimedes;* 3 others.
MATHEMATICS AND MUSIC — Jeans: *The Mathematics of Music.*
MATHEMATICAL DIVERSIONS, PUZZLES, AND FANCIES — selections by: Stephen Leacock, Lewis Carroll, W. W. Rouse Ball, 7 others.
THE MATHEMATICIAN EXPLAINS HIMSELF—Hardy: *A Mathematician's Apology;* Poincare: *Mathematical Creation; How Ideas Are Born;* Von Neumann: *The Mathematician.*
MATHEMATICS AND MORALITY — G. D. Birkhoff: *A Mathematical Approach to Ethics.*

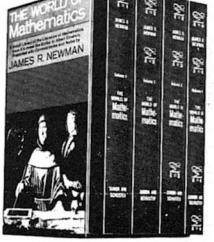
The most extensive collection ever published, for layman and expert, of the great literature of Mathematics from the Rhind Papyrus of Egypt to Einstein's theories. Presented in four handsome illustrated volumes with 500 drawings, halftones and facsimile reproductions.

THE WORLD OF MATHEMATICS, published in 1956, became an instantaneous and spectacular bestseller. Since then this superb collection has found its way into more than 112,000 homes in the original higher priced, hard-bound editions.

Over the years it has become apparent that, for many thousands for whom the collection would be most rewarding, the $25 price has been too high. So we explored every possible way of producing a handsome, readable, durable set at far less. The result is the four-volume paperback WORLD OF MATHEMATICS. Not a word has been cut. The type page is exactly the same as in the original edition. The paper, while of lighter weight, is of excellent quality. The principal cost difference is in the binding and in our savings on substantial printings. We are extremely pleased with the handsome paper-cover binding. The result, at $9.95 for the boxed set, is surely one of the great book bargains of all time.

From Vajda on Matching Pennies to the Theories of Einstein

From Archimedes on *Poppy Seeds and the Universe* to Shaw's *The Vice of Gambling and the Virtue of Insurance* — here are 133 great books, essays, articles and stories — more than a million words. All are woven together with a clear and brilliant 130,000 word commentary by James R. Newman, member of the Board of Editors of *Scientific American* Magazine.



Every Field of Mathematical Thought

Do you know what the smallest thing in the Universe is? The biggest? The fastest? Read D'Arcy Thompson's essay on *Magnitude.* From Von Neumann's classic *Theory of Games* to the mathematics of music—even of metaphysics and golf—every field of mathematical thought is represented.

Two basic books are included in full: Jourdain's *The Nature of Mathematics* and Turnbull's *The Great Mathematicians.*

Only a very small fraction of the authors and titles can be included in the partial contents listed here. In their entirety they are irresistible to all who respond to the miracle of the human mind that dares to chart the galaxies, weigh earth and atom, outguess chance, invent the straight line, add irrational numbers, and describe infinity.

How to Take Advantage of This Offer

In order to make this great library of books more easily available, your set not only will be sent for a 10-day trial examination but, if desired, it may be purchased on the easy terms offered below.

To examine it in your home for 10 days, simply fill out the order form and mail it today. A set will be sent to you at once. If you are not absolutely sure that you and your family will place the value of THE WORLD OF MATHEMATICS at much greater than its cost, return it to us and owe nothing. Otherwise, you may (if you wish) remit only $1.95 in 10 days and $4 monthly for two months, plus postage, as payment in full. At all bookstores, or mail coupon to: SIMON AND SCHUSTER, Publishers, Dept. 100, 630 Fifth Avenue, New York, N. Y. 10020.

10-DAY TRIAL EXAMINATION

SIMON and SCHUSTER, Publishers, Dept. 100
630 Fifth Avenue, New York, N. Y. 10020

Please send me.....sets of THE WORLD OF MATHEMATICS; in four soft-bound volumes, boxed, over 2500 pages, illustrated. If after browsing through it leisurely for 10 days I am not completely delighted, I will return the set(s) and owe nothing. Otherwise I will remit only $9.95 per set — in three payments consisting of $1.95 within 10 days, and $4.00 per month for two months (plus postage) for each set.

☐ **CHECK HERE** if you prefer to examine the De Luxe Edition — four handsome, hard-bound volumes, gold-stamped, boxed. Same 10-day examination offer. If you decide to keep the De Luxe set(s), remit only $5 per set within 10 days, then $5 per month for each set for four months, plus full postage charges with the last payment.

Name.....
(PLEASE PRINT)

Address.....

City.....Zone....State.....

☐ **ADDED SAVINGS:** Check here if you are enclosing $9.95 per soft-bound set ($25 per De Luxe hard-bound set) as payment in full. Then we will pay all postage. Same 10-day privilege of return for full refund applies.

For the first time anywhere—33 great new stories by all the science fiction masters of our time.

Not collected from magazines, not collected from other books, every one of these stories is new and original, especially written for this volume — to make it the most exciting science fiction anthology in years, and a "collector's item" in years to come.

DANGEROUS VISIONS, edited by Harlan Ellison, contains almost a quarter of a million words — one of the biggest anthologies of original material ever assembled in any field. Included are such long-awaited items as Theodore Sturgeon's first novelette in seven years, the first Fritz Leiber story in four years, the first story in twenty years by Howard Rodman . . . stories of all lengths: as short as Lester del Rey's "Evensong" and Henry Slesar's "Ersatz"; as long as Keith Laumer's 12,000 word "Test to Destruction" and Philip José Farmer's 33,000 word "Riders of the Purple Wage." Each is illustrated by Leo and Diane Dillon, each has a preface by Harlan Ellison and an afterword by the author, revealing insights to your favorite writers, available nowhere else.

To get your copy of **DANGEROUS VISIONS,** mail the free examination coupon. If you are not delighted with the book, you may return it and owe nothing.

THE COMPLETE ROSTER OF CONTRIBUTORS:

Lester Del Rey
Philip José Farmer
Harlan Ellison
Philip K. Dick
Joe L. Hensley
2 by David R. Bunch
Theodore Sturgeon
Sonya Dorman
Kris Neville
John Brunner
Roger Zelazny
Robert Silverberg
Miriam Allen deFord
Brian W. Aldiss
Larry Niven
Poul Anderson
Carol Emshwiller
Larry Eisenberg
John T. Sladek
R. A. Lafferty
Keith Laumer
Samuel R. Delany
Frederik Pohl
Robert Bloch
Howard Rodman
Fritz Leiber
James Cross
Damon Knight
Henry Slesar
Jonathan Brand
J. G. Ballard
Norman Spinrad

FREE EXAMINATION COUPON

To your bookseller or to
DOUBLEDAY & COMPANY, INC.
Dept. 7-ANL-11, Garden City, N.Y.11530

Please send me.....copies of **DANGEROUS VISIONS.** I understand I have two full weeks to decide whether to keep the book(s). If I wish, I may return them within that time and owe nothing. Otherwise, I'll be billed just $6.95 plus postage as payment in full.

NAME_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

SAVE: Enclose payment now and we pay postage. Same return privilege guaranteed.

Offer available only in U.S.A. and Canada.

JOHN W. CAMPBELL
Editor
KAY TARRANT
Assistant Editor
HERBERT S. STOLTZ
Art Director
ROBERT E. PARK
Business Manager
WALTER J. McBRIDE
Advertising Manager

SCIENCE FICTION SCIENCE FACT

analog

NEXT ISSUE ON SALE
November 9, 1967
$6.00 per year
in the U.S.A.
60 cents per copy

Cover by
Kelly Freas

Vol. LXXX, No. 3 November 1967

NOVELETTES

SHORT STORIES

SCIENCE FACT

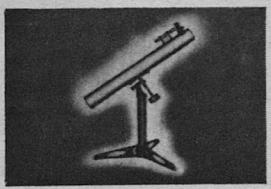
READER'S DEPARTMENTS

Analog Science Fiction/Science Fact is published monthly by the Condé Nast Publications, Inc. Executive, Publishing, Editorial and Advertising offices: 420 Lexington Avenue, New York, N.Y. 10017. I.S.V. Patcévitch, President; Alfred W. Cook, Treasurer; Mary E. Campbell, Secretary. Second class postage paid at New York, N. Y. and at additional mailing offices, under the Act of March 3, 1879. Subscriptions: in U. S., possessions and Canada, $6 for one year, $10 for two years, $13 for three years. Elsewhere, $8 for one year, $16 for two years. Payable in advance. Single copies: In U.S., possessions and Canada, 60¢. Six weeks are required for change of address. In ordering a change, write to Analog Science Fiction/Science Fact, Boulder, Colorado 80302. Give both new and old address as printed on last label. The editorial contents have not been published before, are protected by copyright and cannot be reprinted without the publisher's permission. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage.
POSTMASTER: SEND FORM 3579 to ANALOG SCIENCE FICTION/SCIENCE FACT, BOULDER, COLORADO 80302.

EDITORIAL AND
ADVERTISING OFFICES:
420 LEXINGTON AVENUE
NEW YORK, N. Y. 10017

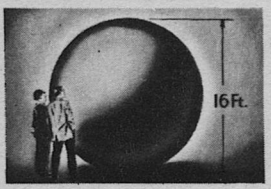
MAIL ORDER SHOPPING MART UNUSUAL VALUES

A selection of products available by mail for readers of Analog.
All merchandise sold on a money-back guarantee. Order Direct by Stock No. Send check or M.O.



4¼" Astronomical Telescope

See craters on the moon, rings of Saturn, double stars. Up to 225x. New vibration-free equatorial mount. Mirror f/11, finished to better than ¼ wavelength. Gives theoretical limit of resolution. Rack-and-pinion focusing. Aluminum tube, 6x finder telescope. 2 standard eyepieces and Barlow lens give powers up to 225x. Free with scope: "Star Chart." 272-page "Handbook of the Heavens," plus "How To Use Your Telescope." Shipping wt. 25 lbs.
Stock #85,105A ..... $84.50 f.o.b.

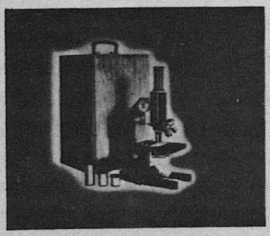


Giant Weather Balloons

"Balls of fun" for kids, traffic stoppers for stores, terrific for amateur meteorologists. Create a neighborhood sensation. Great backyard fun. Exciting beach attraction. Amateur meteorologists use to measure cloud heights, wind speed, and temp. Made of heavy duty neoprene. Inflate with vacuum cleaner or auto air hose; or locally available helium for high rise.
Stock #60,568A....8'..... $2.00 Ppd.
Stock #60,632A....16'.... $7.00 Ppd.

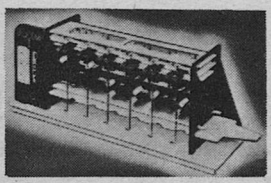
Wff'n Proof—Games of Logic

Practice abstract thinking and math logic. Developed by Yale prof. If you think learning should be fun, try WFF'N PROOF brain-to-brain combat! 21 games of progressive difficulty. Starts with simple games mastered by 6-year-olds, ends with subtle logic for challenge professional logicians. 8½" x 5¾" case contains logic cubes, playing mats, timer & 224-p. book.
Stock #60,525A ..... $6.00 Ppd.



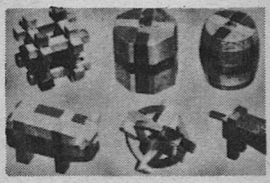
25X to 900X Laboratory Microscope

Sturdy, monocular-type. 3 Coated Achromatic parfocal objectives—5X (0.10 NA), 10X (0.25 NA), 60X (0.85 NA); triple revolving nosepieces. Automatic focusing stop prevents damage to objectives and slides, fixed 160mm tube. Rack & pinion coarse focusing & micrometer type slide fine adjustments. 3 Huygenian eyepieces: 5X, 10X, 15X. 11¾" hg. 11 lbs. wt.
Stock #85,049A ..... $89.95 f.o.b.



New Model Digital Computer

Solve problems, tell fortunes, play games with miniature version of giant electronic brains! Adds, subtracts, multiplies, shifts, complements, carries, memorizes. Colored plastic parts easily assembled. 12" x 3½" x 4¾". Incl. step-by-step assembly diagrams. 32-p. instruction book covering operation, computer language (binary system) programming problems & 15 experiments.
Stock #70,683A ..... $5.98 Ppd.



WOODEN SOLID PUZZLES

Here's a fascinating assortment of 12 different puzzles to provide hours of pleasure and stimulate ability to think and reason. Animals and geometric forms. Take them apart and reassemble them. Lots of fun for the whole family—young and old. Will test skill, patience and ability to solve problems. Order yours now.
Stock #70,205A ..... $3.50 Ppd.

INSTANT CHEMICAL LIGHT KIT

Produce instant illumination without heat, flame, electricity. Make emergency flashlight, write messages in the dark, create spectacular "magic" effects, mark trails, targets, edges of steps & doorways, etc. Just expose activating chemical to air. 500 times brighter than average highway in moonlight. Last 15 min. to 4 hrs. depending on control factors, indefinitely when sealed. Kit incl. chemical in 5 forms.
Stock #60,647A ..... $5.00 Ppd.

AMAZING NEW HOLOGRAMS

Now evaluate tremendous impact of almost unbelievable new 3-D photo-technique for small cost. Simple transmission-type holoram result of splitting laser beam. Dimension appears carved in stone. Cut in half repeatedly—parts still contain full scene. Fantastic future potential. Use slide projector light source or flashlight bulb filament. Filter incl.
Stock #40,969A (4"x3¾") $15.00 Ppd.
Stock #30,574A (2"x1⅞") $4.50 Ppd.

GET FREE CATALOG

SEND FOR FREE CATALOG 'AK'

Completely new 1968 Catalog. 148 pages packed with nearly 4,000 unusual bargains. Exciting new categories. Many new items. 100's of charts, illustrations. Many hard-to-get war surplus bargains. Enormous selection of telescopes, microscopes, binoculars, magnets, magnifiers, prisms, photo components, etc. For hobbyists, experimenters, workshops. Shop by mail. No salesman will call. Write for Catalog "A" to Edmund Scientific Co., Barrington, N.J. 08007.

NAME

ADDRESS

CITY

STATE ZIP

ORDER BY STOCK NUMBER • SEND CHECK OR MONEY ORDER • MONEY BACK GUARANTEE

EDMUND SCIENTIFIC CO., BARRINGTON, NEW JERSEY 08007

editorial by John W. Campbell

impossible problem

The suburb I have lived in for the last twenty-five years is only about ten miles from Newark; when the riots broke out there I was, naturally and personally, interested. Though only a small minority of Negroes caused any trouble, or were involved in any way—it should be remembered that only a small percentage of the plutonium atoms in an atomic bomb are actually involved in fission reactions. Considerable violence and destruction result just the same.

If Newark were the only city where such things went on, we could well suspect that the city administration were to blame for the explosion.

But that was definitely not the case—riots also broke out in areas from Watts to Boston, with way stops all the way between, and south to Florida. Hartford—Cairo—Cleveland—a dozen others that were neither under the Newark city administration, nor under the New Jersey state government.

But Newark offers a number of factors that are fairly clear-cut and help straighten out just what is going on.

For one thing, Newark is a city that does not have a Negro ghetto. Despite what Negro spokesmen have said, and what news media have most carelessly repeated—there is no Negro ghetto in the City of Newark.

A ghetto, by definition, is a compact area wherein a minority group is effectively walled off from the

majority of a certain community.

The population of Newark is sixty per cent Negro; since they are the majority, there may be a White ghetto, but there can't be a Negro ghetto.

The Negroes in Newark are not disenfranchised; they are perfectly free to register and to vote. If they don't like the city administration, they are perfectly free to "throw the rascals out" . . . if they would take the trouble.

One of the Negro spokesmen in Cairo, Illinois, during the riot there, explained that the Negroes were being unjustly discriminated against, because the population was fifty per cent Negro, and, therefore, they ought to have fifty per cent of everything in the city.

Now it's remarkably easy to say, "There's something wrong here; things aren't going the way they should! You should fix it!" But following that with specifications of a plan of precisely how it should be fixed—a responsible plan that can, in fact, be applied . . . That, friend, is a very different question, a question that most angry complainers duck with great rapidity and skill. "Well look, I'm no expert—you're supposed to be!" being one of the favorite gambits. With, of course, the added factor of rejecting the expert's opinion of what can and can't be done.

The problem is, very simply, that the Negroes in our cities are demanding that which is impossible, and showing a childish-tantrum reaction when the cities are unable to give them what they "know" they have a "right" to.

Newark's position is typical.

The Negro population of Newark has grown enormously in the past twenty-five years. Huge numbers of Southern Rural Negroes have moved into the northern cities such as Newark, seeking to escape the segregation traditions of the South and, even more attracted by the relatively high incomes provided by the Welfare systems of the northern cities, and to a somewhat lesser extent, the higher pay of industrial jobs in the North.

Part of the boiling resentment in the Negro community in Newark was that there were no jobs, there was massive unemployment, and most of what jobs there were seemed to go to Whites. Housing was decidedly bad, overcrowded and badly maintained—if at all—and nobody seemed to want to do anything about it.

And they complained most bitterly that the city administration wouldn't listen to them, wouldn't pay any attention to their complaints. That the mayor and the councilmen were always out when one of their spokesmen tried to reach them and make them understand their serious problems.

That complaint has come up at every investigation after one of the riots in every riot-torn city—so it's

not just Newark's administration.

One thing about Newark was exceptional, and should be mentioned at this point; the mayor committed two major political blunders, one of which was truly stupid, the other, politically, poor judgment, though it was, in long-term values, a wise idea. The real goof was the "Callahan incident"; the mayor appointed to the Board of Education a long-time political ally, to whom he owed a considerable political debt, and rejected the Negro community's choice of a highly qualified Negro. Callahan had managed to graduate from high school, and had been an active political worker. The Negro had been in the city budget department, was a CPA and held a Master's degree in Business Administration.

The mayor's action on that seemed to the Negro community a flagrant proof that even a highly qualified Negro didn't have a chance in Newark.

Actually, the mayor was a strictly honest politician paying his honest political debts—and one of Hitler's blue-eyed blond Aryans wouldn't have gotten the nod even if he'd held a Ph.D. in Education.

But it was a magnificent political goof, and served to exacerbate Negro feelings.

The other political error had to do with the siting of a new medical school-hospital complex. The administration decided to locate it

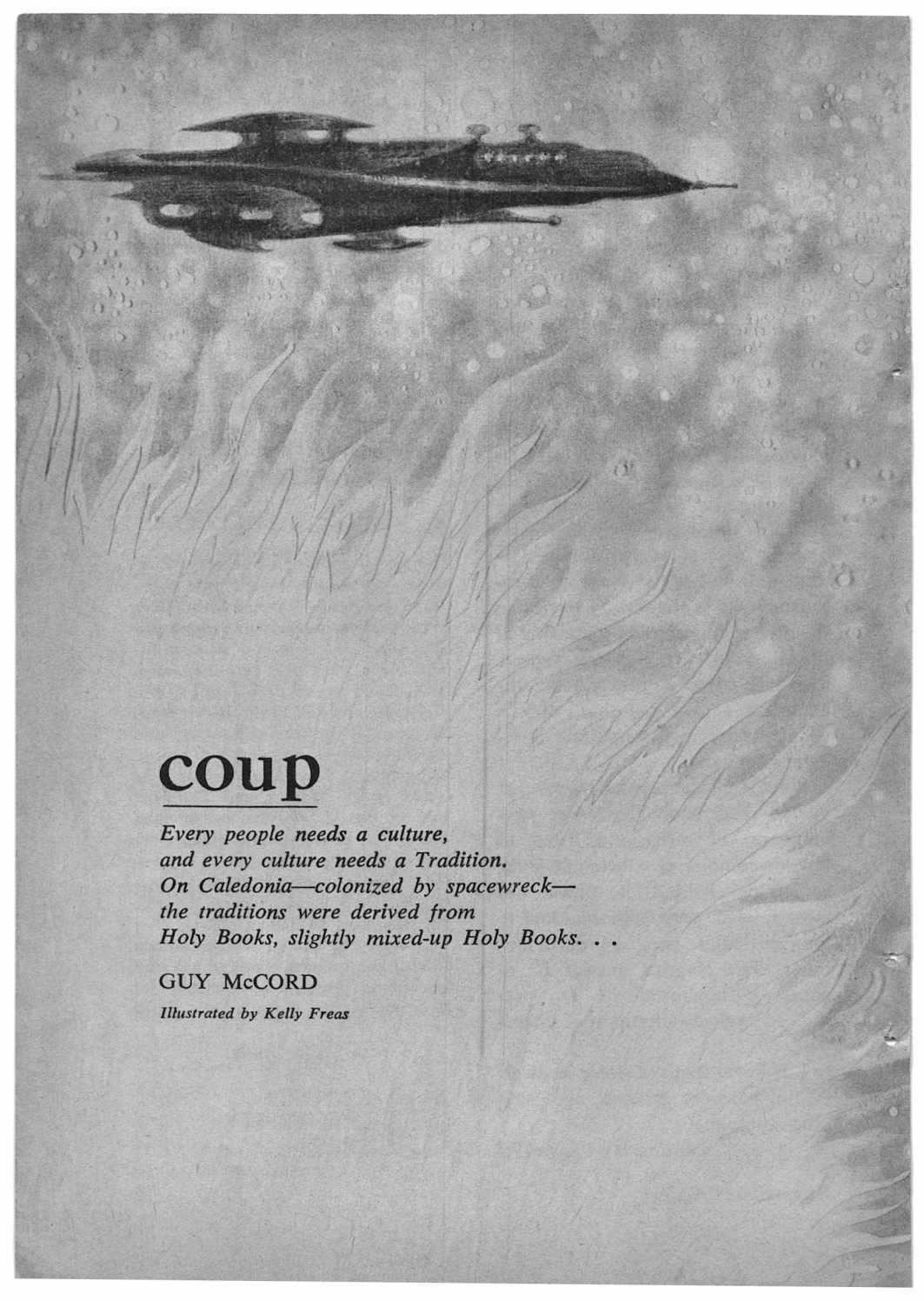
where the most densely packed Negro slum was—to wipe out the slum and replace it with the hospital. That this was a wise move, *in long term values* can be shown. But the Negro community's reaction was "They're trying to drive us out—take away our homes and not offering us any replacement!" That suspicion was perfectly valid; that's exactly what the administration wanted to accomplish.

Those two factors were strictly local affairs—but they were of relatively little importance. The big factors were the bad, and worsening housing, the lack of employment, and the refusal of the administration to listen to the Negro's complaints—the refusal to recognize the misery and problems gnawing at the Negroes. Precisely the factors that have come up in every investigation of a race riot that's shown up anywhere in the nation's cities. That's not local.

Now if all the administrations of all the cities show that same phenomenon of refusal to listen to Negro complaints—there may be something behind it that's not merely local, personal-individual to the particular men in particular cities. The Negro's answer is, of course, "They're all of 'em prejudiced and discriminating against us!"

I believe that's a false answer. Again, consider Newark as a specific example.

continued on page 174



coup

Every people needs a culture,
and every culture needs a Tradition.
On Caledonia—colonized by spacewreck—
the traditions were derived from
Holy Books, slightly mixed-up Holy Books. . .

GUY McCORD

Illustrated by Kelly Freas

I

John of the Hawks brought his steed to a sudden halt just short of the top of the hill they had been ascending. Some instinctive alarm had sounded. Something there is in the warrior born that warns of danger and if the warrior would live, he heeds it ever. Were this not so there would be scarce a clansman from Dumbarton to Stonehaven, for the ambush is a way of life on the planet Caledonia.

He slid from his animal and snaked his carbine from its scabbard. He tethered the animal lightly, so that no time would be wasted were it necessary to beat quick retreat, and made his way quietly to the hill's crest. The last few yards he went on hands and knees, the last few inches he squirmed on his belly.

There were several bushes on the crest. He wiggled up behind one and peered through its branches and leaves. John of the Hawks sucked in air.

Below was a stream, flanked by trees and other vegetation. By the stream were standing four saddled horses and three draft animals. The latter were burdened down with what were obviously butchered cattle, and, since this was Hawk preserve, obviously raided beef cattle.

Now he could make them out. Three of them, and from their kilts, they were of the Clan Thompson. The kilts they were in the process of removing. The situation was obvious. They had butchered the animals and were now about to take a swim to clean up. Being deep in Aberdeen territory, they had not wanted to be slowed down by herding the beef back to their town, but had butchered them on the spot and packed the choice portions of the carcasses on their extra animals.

Moving slowly, quietly, John flicked three cartridges from his bandolier. He threw the breech of his carbine and inserted one of the shells. The other two he stuck, point first, into the ground near his right hand, instantly available for a quick reloading.

The others had left their saddle guns in their scabbards, but John had no illusions about the fighting qualities of the Clan Thompson. Thieves they might notoriously be, but also competent fighters. Once he opened fire, the bets would all be down and there were three adult clansmen down there, and he was but a lad, not yet raised up to full Phyletic level.

Three of them?

He hesitated at squeezing the trigger, though he already had the sights trained on one who was just about to enter the water. There were four saddle horses.

He let his eyes go over the scene again, and immediately received his answer.

Slightly up the stream, in a thicker clump of trees, was the other

member of the party. She had drawn away from the men for privacy. John of the Hawks made a wry mouth. He had heard that the women of the Thompsons were shameless, but it was unseemly and not meet that one should accompany a raiding party.

He watched for a long moment. All were in the water now. The girl's body gleamed white in the clearness of the stream. She was young, probably having no more years than John's own seventeen.

He grunted his irritation. One does not fire upon men in the presence of their feminine kin, although in this particular case there was little, if any, danger of his bullets going so far off aim that she would be endangered. There was no stronger ban than that against injuring a woman, even though vendetta was involved. The male of a species does not destroy the female, not even man. At least, not on the planet Caledonia.

He thought about it. It was too far back to Aberdeen to expect to be able to ride for assistance, enough assistance that the raiders, girl and all, might be captured without bloodshed.

But even as he thought about it, he knew the answer. It was foolhardy, without doubt, but it was the only thing he could do, given the situation.

He took up the two extra cartridges and returned them to his bandolier and began squirming backward. Once off the rise, he came to his feet and hurried to his animal. He put the carbine back into its scabbard and then unbuckled his belt with its claidheammor and skean and attached them to the saddle. He took his coup stick from its sheath and tucked it temporarily in his belt and then ascended the hill again.

They were all swimming and even at this distance he could hear their shouts and jests as they made at their horseplay. He grinned wryly as he began squirming his way down the hill toward them. They would sing a different song, if he was successful in his scheme.

He took what advantage he could of trees, shrubs and bushes, and finally achieved his immediate goal, a place in the shrubbery along the river, between where the girl and the men bathed. Now, he had a slight advantage. If the clansmen heard him stirring in the brush, they would think it the girl; if she heard a stirring, she would think it part of the noise the men were making as they splashed, dove and swam.

On hands and knees he crawled in the direction of the animals. This, now, was the crucial point. It was all a matter of how soon they spotted him.

And there was a matter of sheer luck, too. There were four saddle horses. If he made the mistake of attempting one which was so trained that it would only seat its master, he was destroyed.

The answer to that, or so he hoped, came to him as he crept nearer. One of the beasts had no carbine scabbard. The girl's of course! And a girl's horse was less apt to be clansman trained to accept no stranger on its back. At least, so was his prayer to the Holy.

There was a shout from the river bank.

He was on his feet and dashing. The shouts trebled.

He flung himself on the back of the animal he had chosen, even as he mounted, tearing free the tether that had tied the horse to a small bush. He sunk heels into the beast's side, screaming the battle halloo of the Clan Hawk. He pulled the coup stick from his belt and slashed at the other three mounts. He gripped their tethers, one by one, and pulled them free. He slashed their haunches, driving them before him. From the river's edge, the Thompson clansmen were coming at the run, shouting their anger and threats.

He pulled hard on the reins of his mount, turning it, and headed back for the raiders. Only now, they saw what he held in his hand and tried to take last minute measures to avoid him.

The coup stick came up and down, so fast as to be a blur.

He slashed them, one-two-three, calling in repetition so quickly that the words came out all a jumble, *"I-count-coup-I-count-coup-I-count-coup!"*

Then he was around again and away, dashing after the horses he had just stampeded. He looked over his shoulder in triumph and just in time, even as he was shouting his halloo.

Two of the three were seated on the ground, heads in hands, wailing their disgrace and frustration. But the other had turned and sped back to the river's edge. And only now did John see the carbine leaning there against a tree trunk.

He cut short his battle cry, in mid-syllable, and flung down on the far side of the horse, clinging to the saddle by but one heel, his left hand grasping a handful of mane.

And just in time. The carbine barked its command. One of the horses screamed. John came back full into the saddle now. The wounded horse ran another twenty yards then stumbled and pitched suddenly, and fell.

John considered, only momentarily, halting long enough to strip it of its trappings but gave up the possibility. For all he knew, the rifleman had additional rounds of ammunition, and John was still within range. He scrambled up the hill, kicking his heels ever into the frightened animal he rode, herding the remaining two beasts before him.

There was another element. Undoubtedly, already, behind him the Thompsons were stripping the beef carcasses from the remaining animals and would soon be in pursuit.

John doubted that the draft animals were as fast as those he now possessed but one never knew. They had the carbine and give the Clan Thompson its due, they were as good marksmen as ever participated at the annual shoots at the assembly of the Dail of the Loch Confederation.

Up the hill, shouting again the halloo of the Clan Hawk, up and over the crest. He galloped to his own steed and flung himself from the saddle of the girl's horse, into the one to which he was more accustomed, without descending to the ground.

He took up the reins of the three remaining captured beasts and started off, making a beeline for Aberdeen and the security of the town of his birth. He was chuckling happily now. He had taken his risk and all had come off as though rehearsed.

He had counted coup on three of the redoubtable Clan Thompson raiders and had stolen their horses

and most of their weapons. How the town would respond! How the criers would shout his name. Though but of seventeen years, none would dare speak against his being raised up to full participation in the Phylum. The sachem himself would acclaim him, the caciques and sagamores. He would be a man among men and free to participate in the muster.

He pushed hard, not sparing the horses.

When he had ridden out of Aberdeen, a single lad on a horse, though warned by his uncles to take care, if he went beyond the lands of the clan there were none to say him nay. A clan does not remain strong by preventing the young men from learning to scout, to raid, to defend themselves from the foe. But he had been in comparatively little danger then. Had he run into a raiding party of Bruces, Davidsons, or Thompsons for that matter, he could honorably run for it, being one against many. And it would have been unlikely the others would have taken after him, there being small profit in chasing lads still not of full Phyletic age.

But he was now in possession of worthy booty and fair game for any clansman, save the Hawks and the sister clans, of course, did any spot him returning to Aberdeen.

He rode through the night, the pace being awkward since he continued to hold onto the reins of the captured beasts, rather than try to herd them. They were unused to him and nervous, after all the excitement, and he was afraid of losing one or more in the night.

He entered Aberdeen in the early afternoon of the following day, both he and the animals exhausted. He had paused along the way only for water. His luck had held and he had seen no clansmen, not even his own kin.

At the gate, the warder goggled at him. The other was a Fielding, not a Hawk, but he knew John well, having stolen a Hawk girl as his bride.

"Where in the name of the Holy did you find those animals, John of the Hawks?" he called.

"It was nothing," John grinned down at him. "I came out from ambush upon three, nay four, if one counts women, of the Clan Thompson. I confounded them and seized these, their horses, as well as two carbines and these other trappings you see."

The other was still staring. "Did you kill any?" he demanded, unbelievingly. He was fully aware of the fact that John was under no compulsion to tell the truth to him, a Fielding and hence not a clansman of John's even though of the same Phylum.

"*Kill* any?" John said loftily, still grinning. "I counted coup on all three!"

The other snorted. "As to that, I will wait to hear your declamation

before the muster." He snorted again. "No one exaggerates before the assembly of the muster. That is the ban."

But John was a man now, before men, and he said coldly, "Do you suggest that I would break a ban, before the muster or anywhere else, warder of the gate?"

The other grunted, but backtracked, being in the wrong and knowing it, and also being conscious that whether or not John was exaggerating, that somehow he had acquired three priceless battle steeds, the proof being there before him.

"No, I make no such suggestion, John of the Hawks. Enter, and congratulations."

John was grinning again, even as he herded the loot before him. "There will be shouting of my name by the criers tonight," he boasted.

The other had his petty revenge. "I doubt it," he said.

John halted his horses and scowled puzzlement. "How do you mean?" he demanded. "How long has it been since either a Hawk or a Fielding counted coup on three raiders in a single day and seized their possessions as well?"

"A long time indeed, John of the Hawks, and your feat is praiseworthy, but, unfortunately, for your moment of honor, the muster is to go into session shortly."

It was John's turn to stare. "The muster! But this is only Apriltime."

"Yes, and ordinarily the sachems and caciques would not join in the muster for three months, but they are gathering to discuss the travelers from Beyond."

"Beyond? Beyond what?"

"You do not read the Holy books sufficiently, lad," the warder said condescendingly. "Surely you have heard of Beyond."

"But that's legend! Myth!"

"You'd better not let any Keeper of the Faith hear you say that. Besides, the proof is there before you. Two days before this, the ship from the sky arrived, landing between Aberdeen and Dumbarton. The travelers from Beyond sent out a group and now accept the hospitality of our town."

John gaped.

II

But for the moment the sensational news could wait. John was weary and hungered beyond the point where anything else mattered. He rode in the direction of his clan's longhouse, somewhat miffed at the timing of his moment of glory. Travelers from Beyond, indeed!

At the entrance to the longhouse, two of his closest friends duplicated the goggling of the warder of the gate.

John of the Hawks dismounted with considerable dignity, and tossed his reins to one of the others.

"Don of the Clarks," he said loftily, "be a good lad and take my

animals to the pastures." He looked at the other young man, who wore kilts similar to his own, those of the Clan Hawk. "And Dewey, would you mind, first, stripping the animals of the weapons and harness and taking them to the council hall, until I need them in my declamation before the muster, upon being raised up to the Phylum?"

The one addressed as Dewey stuttered, "Where . . . where . . ."

But John raised a hand, exaggerating his weariness. "Later, lads, later. You'll hear it all when each clansman recites his victories to the assembly."

He turned and entered the community house and headed for his family's quarters.

They called after him, something urgent, but he was too tired now to chatter with them, no matter the glory. He wanted food, to bathe, and fresh clothing. The after effects of the excitement and hard riding were upon him.

In the small room that was his own, he began to strip, but then paused, scowling. He could hear voices in the next room, the family living quarters, but they were not the voices he recognized, those of his mother, younger brother and two sisters. They were adult male voices, and now he could even realize there was a strange accent.

He went to the door and pressed an ear against it, frowning still in puzzlement. The voices were clearer now.

One was saying, "Well, you're the nearest thing to an ethnologist we've got. What do you think?"

There was a pause before another voice said hesitantly and dourly, "I'm no ethnologist and your guess is probably as good as mine. I'd say they're the result of a crash of some pioneer group, Skipper. A very bad crash, since they lost communication."

"Why pioneers? Why not some passenger ship?"

"For one thing, they've got horses and cattle. Even trees of Earth-side type, now adapted, of course, to this world's ecology. Besides, what would a passenger ship be doing this far in?"

A third voice broke in. "What was a pioneer ship doing this far in, for that matter? From what we've seen so far, they've been here a long time. They're obviously originally an Earth culture, but they don't seem to have much more than legends about their origins."

The first voice, heavier than the others and with a note of command in it, said, "Well, it goes both ways. I've never heard of them, either. They must go so far back that you'd have to go deep into the archives to even check on the possibilities."

The third voice said, "I just thought of something. They must go so far back that they might have had trouble with the warp. One of the very earliest colonizing ships. Before the bugs were all ironed out.

They must have had trouble with the ship's warp and it was thrown all the way in here."

"Maybe," somebody else growled in disgust. "They're certainly primitive. Look at this. Look at these plumbing fixtures, over here."

A fourth voice spoke up for the first time. "What're you complaining about? We're lucky they've got plumbing at all. Did you notice those overgrown stickers all the men carry? Good grief, swords, in this day and age."

"They also carry rifles," the second voice said. "We're lucky we weren't assassinated before we ever got the chance to tell them who we were."

"Single shot rifles," the second voice said. "Krishna! Look at these plumbing fixtures."

"What about them?"

John of the Hawks drew back from the door and stared at it. He was tired to the point where his mind was half blank or the reality of the situation would have come home to him quicker. He scowled his puzzlement and put his ear back to the door.

A voice was saying, "They're *platinum.*"

"Platinum? Don't be ridiculous."

"I think Harmon's right. Look at this, Skipper."

"Who'd ever use platinum for faucets?"

Another voice, the second one John had heard, broke in. "A people who have so much of it that it's comparatively worthless, that's who." There was an element of awe in the tone.

"Here, let me scratch it with this knife blade."

John had removed his belt with its skean and claidheammor, but now he went over to his bed and picked the harness up again and belted it about his waist, still scowling. He went back to the door and pressed his ear against it once more.

The voice which had disclaimed knowledge of ethnology, whatever that was, was saying, "A really primitive culture. They must have an unbelievable system of rituals and taboos."

He, who was addressed as Skipper, said, "Why do you say that?"

"Because their language has changed, over a period that must amount to centuries, so little from Earth Basic. And they still retain so many customs of the original Earth. Only very strict adherence to taboos and rituals would maintain such institutions so well. It's too bad we're not a larger expedition with a few anthropologists and such along."

"Oh, no it isn't."

The Skipper's voice said, "What do you mean, Harmon?"

"I mean platinum. Probably mountains of it. There are only eight of us. Four back on the ship, and us. Good. Only that number to split it with."

There was a long pause.

John could stand it no longer. He

opened the door and walked through, staring.

There were four of them and he'd never seen such dress in his life. It was evidently some sort of uniform and all were garbed almost identically, so undoubtedly they were fellow clansmen. The dress was colorless, drab by any kilt standards, and each leg was completely sheathed. Above everything in strangeness was the fact that though all were obviously adult, none wore claidheammor nor even a skean.

It came to him then that these, of course, were the travelers from Beyond, in short, men from another world. Until this very moment, John had never really believed in such, in spite of the Holy books and the preachings of the bedels and the Keepers of the Faith.

And it came to him also that, although the others wore no swords nor daggers, the holstered devices on each hip were undoubtedly weapons—weapons that would have come under the ban in any Phylum John of the Hawks had even heard of.

Two were seated in the most comfortable chairs the room provided, and two were leaning against the fireplace. All eyes turned to John when he entered.

He blurted, "What are you doing in this home?"

The youngest of the four, one of those leaning against the fireplace, let his hand drop nonchalantly to the holstered object on his hip. It was, John decided, probably some sort of gun. He had never seen a gun smaller than a carbine.

The eldest, who was seated, scowled at the intruder. "Who, in the name of Krishna, are you?"

Although their voices were heavily accented to John's ear, the words were almost all understandable, although he didn't know what Krishna meant.

He said, "I am John of the Hawks, and these are my assigned quarters."

The other seated man said, "Oh. Of course, sorry, John, uh, of the Hawks. The . . . what did they call him? The head man."

One of those at the fireplace said, "The sachem."

"That's right. The sachem offered us this apartment. Your family has been moved in with one of your cousins, I think he said. You were away. We're very grateful, of course."

John of the Hawks flushed. "I am shamed. My home has been honored by being chosen to provide hospitality for travelers."

The oldest, a heavy-set, heavy faced man, said, "I am Skipper William Fowler of the exploration Spaceship *Golden Hind*. And these are three of my officers." He indicated them. "First Officer DeRudder; Perez, First Engineer; and Mr. Harmon, my Second."

Harmon, who was the one who

had put his hand on his weapon when John had entered, was seemingly not too much older than John himself, possibly twenty-five and notable largely for a somewhat twisted, sardonic mouth.

Perez was a little man, and nervous of movement. DeRudder, next in age to the one they called Skipper, was the largest of the four, which wasn't saying much. None were more than six feet tall, so that even John, who hadn't reached his full growth, towered above them.

John said, still flushing embarrassment, "May the bards sing your exploits. My family is honored. My excuses for bothering you. Undoubtedly, you rest before the council of the muster. My claidheammor is at your command." He turned to leave.

The one named DeRudder said, "Just a moment, son."

Son? This was a term that could be used only to a fellow clansman, and from an elder. Certainly the otherworlder couldn't claim to be kin of the Hawks. John was taken aback. However, he turned politely.

The other said, "In there. I suppose it's a bathroom. That metal the faucet's made of. What is it?"

John looked at him blankly, but now the conversation he had eavesdropped upon came back to him. It wasn't quite clear just what the excitement had been about.

"Why, it's called platinum, I believe. The Hawks are herdsmen, not scrabblers in the dirt, nor metalworkers. However, it is called platinum."

There seemed to be a narrow-eyed quality in all four of the strangers now.

DeRudder said carefully, "And it is in good supply on this planet, uh, Caledonia?"

John said, blankly, "Why, honored guest, it is certainly the most common of metals, is it not?"

The other licked his lower lip, unconsciously. "Your sword, there, is steel, isn't it?"

John nodded, still puzzled.

"Ah, is platinum more common than iron? Cheaper?"

"Cheaper?" John said, blankly.

The Skipper was leaning forward and John again got the impression of narrowed eyes, though he didn't know why.

The older man said, "We don't know anything about your means of exchange, but this platinum is so abundant that you use it instead of iron for such things as household fixtures?"

"Why, yes, honored guest. I suppose so. As I say, we Hawks are herdsmen, not metalworkers. I know little about it."

DeRudder cleared his throat. "All right," he said. "Thank you."

John shrugged inwardly and turned again to leave.

He heard their voices, in excited conversation when he had emerged into the long hall beyond. He made a face, accentuating his youth. The travelers from Beyond were cer-

tainly an uncomprehensible group.

Robert, Sachem of the Clan Hawk, came hurrying up, his face anxious. As was usual, he was a clan elder and deserved the respect granted him by his clansmen. Past the age of raiding, he devoted full time to participating in the government of the clan and of the Phylum, and younger Hawks took over the burdens of herding the flocks and otherwise participating in the economies of the clan.

John saluted him respectfully.

The sachem said, "John! I left messages for you, but evidently you have failed to receive them. Your home has been given to travelers."

"Yes," John said unhappily. "I am shamed. I intruded upon them."

The sachem looked at him. "There was no intended discourtesy, and hence it was not unseemly." He beamed suddenly. "Don of the Clarks has informed me of your triumph. If all wasn't confusion, with the coming of the travelers from Beyond, I would insist we adjourn to my quarters and, over your first glass of *uisgebeatha* of manhood, you tell me in detail. As it is, I must summon the visitors for the muster. But quickly, did you kill or wound any of the raiders?"

John smiled his satisfaction at the compliment of his clan sachem. "Robert of the Hawks, I counted coup on three of them."

He was again awarded the goggling of the warder of the gate and his two younger friends.

"You counted coup! On *three!*"

John nodded.

Robert stood suddenly straighter. "It will be until Junetime before the next regular meeting of the muster, but on my own responsibility as sachem of the Hawks, I grant you permission to sit with the clansmen at this assembly."

John was stricken speechless.

The sachem turned to hurry on, but as he went he muttered, "Three! In all my life I have counted coup but twice. *Three!*"

John, in a daze of glory, made his way to the apartment of the cousin with whom he suspected his family was quartered. He was correct, for although no one else was present he recognized various possessions of his mother, sisters and brother. He found a container of his own things as well, and after stripping and bathing, put on fresh clothing.

He then went to the community kitchen and found food. There was no one else here, either, and he realized that all must be in the town square for the unusual muster of the sachems, caciques and sagamores.

Tired as he was, he made his way in the same direction, unable to resist the opportunity of joining the clansmen as a fellow. Ordinarily, he could have expected at least another five years of acting as a herdsmen and scout before being raised up to full clansman.

The muster was in progress.

The four strangers were seated

together in positions of honor in the circle of the eight sachems of the Aberdeen Phylum. Behind them were seated the second circle of the Phylum caciques, sagamores and noted raiders. Behind them were seated circles of clansmen, each clan together. Beyond, a respectful distance, were standing the women, young men and children of the Phylum and beyond them crowded against the walls of the council building, the great kirk, the Phylum arsenal and the structure that held the archives, were the clanless ones.

Trying not to be ostentatious, but miserably failing, John made his way through the ranks of the women, children and younger men to where the Clan Hawk sat, passing his mother, brother and sisters as he went. They stared at him, uncomprehending, as he joined the full clansmen and took a place.

There were a few raised eyebrows from his adult kinsmen, but none spoke. He knew they would hold him to account, later, probably not having heard of the sachem's permission for him to join them.

The eldest of the Phylum sachems, Thomas of the Clarks, was speaking, he alone of the inner circles on his feet. The speech was predictable. He was welcoming the outworlders, tendering them the hospitality of Aberdeen as travelers in a strange land. Evidently, a bedel, or possibly one of the Keepers of the Faith, had already completed the praise.

When Thomas of the Clarks was finished—and he was a garrulous speaker—he resumed his place among the other clan sachems and all eyes went to the newcomers.

The one who had announced himself as Skipper William Fowler, came to his feet and cleared his throat. He looked about at the assembled muster and bobbed his head in a sort of greeting, in all directions.

"You must forgive us, if we are unacquainted with some of your customs," he said. "As you know, we come from a great distance."

Which was a strange thing to say, John thought. Surely customs were the same everywhere. The bans laid down by the Holy were as necessary on one world as another, and surely the Holy presided over all creation.

The commander of the strangers was saying, "Briefly, we are part of the crew of the exploration Spaceship *Golden Hind* and our assigned task is to map out this sector. We represent the League, a confederation of planets settled by the human race, originally from Earth. You will of course, be invited to join the League. Frankly, we had been of the opinion that the *Golden Hind* was the first craft ever to penetrate this far into the galaxy. But here you are."

Robert, Sachem of the Clan Hawk, came to his feet. His face duplicated the expressions of puzzlement of all the sachems and caciques.

He said, "But, honored guest, this

League of which you speak. Surely you must realize that this muster represents only the Phylum of Aberdeen and we can speak only for ourselves. The meeting of the Dail, of all the Phyla of the Loch Confederation, would still only represent this immediate region. And even the Dail could speak only for *our* confederation. We know of twenty-three other confederations to the north, south, east and west, and how many more lie beyond, what man can say? Save for our two sister confederations, with whom we are at perpetual peace, of course, how could we possibly hold council with the others to decide whether or not to join this League?"

It was the Skipper's turn to frown lack of understanding. "You mean you are at war with all other, uh, confederations?"

"War?" Robert of the Hawks said in puzzlement.

"War. Conflict between nations, uh, that is, confederations."

One of the caciques said, "Ah, he means raids."

The Skipper looked at him. "More than that. A conflict in which the full, uh, confederation would throw its united power against another confederation."

A bedel came to his feet, his face in horror, "But that would be against the ban."

The otherworld officer, who had been introduced to John as DeRudder, said hurriedly, "A taboo. Easy, Skipper."

The leader of the strangers said smoothly to the bedel, "I was not advocating war, simply requesting information about the way of things on Caledonia."

Thomas of the Clarks came to his feet. "Assuming that by some means it was possible to unite all the confederations of Caledonia into a gigantic Dail and all agreed to join this League, of what advantage would it be to us?" He sat again.

The Skipper held out his hands in a gesture to indicate that the answer was obvious. "Why, for trade, for one thing."

One of the caciques spoke up. "Trade of what?"

The Skipper said, "Why, that would have to be decided. Trade for the things you have in abundance, for goods, ideas and so forth of which you have need."

A sagamore said, "But I can think of nothing of which we need from the stars. Those items for which we must trade are easily available from other Phylum and we need go no further than the yearly Dail."

DeRudder stood and said, "Do you mind, Skipper?"

The Skipper muttered, a frustrated element in his voice: "You're the nearest thing we have to an ethnologist. Go on."

DeRudder said, "Perhaps we can start this trade right here and now. Evidently, somewhere near Aberdeen there is at least one mine from which platinum is extracted. Very good. We will draw up a paper giv-

ing all rights to exploitation of these mines to we eight crewmen of the *Golden Hind*. In return, we will immediately have shipped to Caledonia, and to your town of Aberdeen, enough repeating rifles and submachine guns to arm each of your clansmen."

Thomas of the Clarks stood once more. "I do not understand. Some of your words are confusing. What is a repeating rifle and what is a submachine gun?"

DeRudder said, "You have single-shot rifles, and use cartridges in them. These guns fire the same type of cartridges at great speed, five hundred a minute and more."

The bedel was on his feet again, his eyes popping. "But that is against the ban!"

Thomas of the Clarks motioned him to his seat. He turned to the strangers, coldly. "You are travelers and hence eligible to remain in Aberdeen for the three traditional days of hospitality. But as to granting you the exclusive rights to the mines of platinum, obviously that is against the ban. The products of the earth belong to all. Even should we wish to grant them to you, the other Phyla would hardly agree. And, above all, we would not trade them for what you call repeating rifles which are most surely against the ban. Furthermore . . ."

But he was interrupted by the sounding of the conch.

Clansmen leaped to their feet, dashing for their individual longhouses. The caciques and sagamores were shouting orders. Women ran to the arsenal for extra bandoliers of cartridges.

A voice shouted from a housetop, "Raid! Raid! The Thompsons! Raid!"

III

John of the Hawks, with the speed of youth, got back to the longhouse where he had left his carbine as quickly as did any of the clansmen. He tore into the room he was sharing with his brother, ripped his rifle from the wall, grabbed up a bandolier, made a snap decision and sped to the roof, deciding he had no time to await the orders of the raid cacique of the Hawks.

The longhouse of the Hawks served on one side as part of the defensive wall of the town of Aberdeen. The wall was windowless on the side looking out over the fields and the roof flat, save for a parapet.

John sat down behind the parapet, slipped a cartridge from the bandolier, threw the breech and inserted the bullet. He breathed deeply, getting his breath after his run.

They were after the horses, that was obvious. There was shooting and shouting over in the direction of the pastures, and a great deal of dust.

Undoubtedly, the raid caciques would shortly launch a counter blow, but meanwhile John's position was an advantageous one, just in

case the aggressive Thompsons attempted to force the town.

He heard someone come up behind him, but didn't turn. He had his elbows resting on his knees, the muzzle of the gun resting on the parapet.

The newcomer sat down next to him. It was one of the men from Beyond, the one called DeRudder. He was puffing.

He said, "What's happening?"

John said, "The Thompsons. They're raiding our horses."

"Oh. Members of one of the other confederations, eh?"

"No. The Thompsons are part of our confederation."

The other stared at him. "And they're attacking you?"

John put off answering for the moment. Through the swirl of dust a double score and more of mounted men came dashing at full tilt, shouting the battle halloo of the Clan Thompson. In the fore, at breakneck speed, rode two who held only coup sticks in their hands.

John's lips thinned back over his teeth in a grimace of excitement. They were not quite in range. He held his fire. At the pace they were coming, they would be to the wall and directly below him, before he could get off more than two or three rounds from his carbine. He pulled two more shells from the bandolier and placed them on the low parapet.

DeRudder said, "Mari, mother of Krishna, look at them come! What are those small weapons the first two are carrying?"

"They aren't weapons," John said. "They're coup sticks." He darted the other a look of surprise.

"Sticks? You mean the only weapon they have is a stick of wood and they're riding into rifle fire?"

John had no time to argue the niceties of the glory of an unarmed man counting coup upon an armed enemy. His eyes narrowed and he drew a bead on the first of the fast approaching Thompsons. He thought he recognized the man, and wondered at the speed at which the other had been able to organize this raid, after his disgrace at the stream.

He squeezed the trigger gently, but at that split second the two leading raiders flung themselves to the sides of their horses, even as he, John, had done in the affair at the stream, clinging by foot and hand to the far side of the beasts they rode.

DeRudder said excitedly, "The horse! Get the horse and the man'll break his neck when he falls."

John was so startled at the idea that he took his eyes from the carbine's sights and looked at the space explorer.

"But one doesn't shoot a good animal, deliberately." He shook his head and returned to his gun. His eyes narrowed, and he began the squeeze again. The carbine barked.

DeRudder blurted, "You hit him. You hit his foot! Krishna, what a shot!"

John grunted in satisfaction, threw the carbine's breech, extract-

ed the spent cartridge with a flick and inserted a new one. He upped the gun again for another shot.

The leading Thompson, wounded, had fallen from his beast but one of the others who trailed behind caught him up with a sweep and turned his own beast around to head back.

Others of the Clan Hawk were streaming up from below now, and joining in the fire. The raiders were firing back, while at full tilt. John kept his head as low as was compatible with staying in the action, being fully aware of the famed marksmanship of the Clan Thompson.

DeRudder, in high excitement, pulled his hand weapon from its holster. "Here," he blurted, "let me train this on them. I'll show 'em what a *real* gun can do."

Shocked, John of the Hawks dropped his own gun and knocked the barrel of the other's weapon up, just in time. A livid beam reached far into the sky, seemingly into infinity.

DeRudder stared at the Hawk clansman. He said, "I can wipe them all out with one sweep of this."

"And break the ban by using such a weapon! Do you wish a blood feud with the Clan Thompson when there are but eight of you?"

"But they're firing at us!"

"It's only a raid. In revengement for my stealing four horses from them."

DeRudder crouched down behind the parapet. "I give up," he muttered.

The charge had been broken, the oncoming raiders realizing that their attempt had come a cropper, that too many of the Aberdeen clansmen had come on the scene to make the surprise successful. Besides, John suspected that all this was but a diversion, while other Thompsons rounded up as many of the Aberdeen animals as they could before the main body of the defenders came up.

There was no further value in remaining here. John joined his fellow clansmen in dropping to the ground on the farther side of the wall and dog-trotting toward the pastures where the main body of the raiders was making its play. He left the spaceman behind, not bothering to speak to him further. John was still feeling his shock at the other's words and actions. The man conducted himself like a clanless one.

He thought he understood what must have happened. The group of four, counting the girl, had been a small unit of a larger group of the Clan Thompson, a major raiding party rounding up Clan Hawk cattle. After he, John, had stolen their horses they had re-contacted the other Thompsons and followed him to take their revengement at the disgrace of three of their clansmen being counted coup upon.

Their luck had been better than they could have hoped. When they arrived at the Hawk pastures it was

to find that there were but a handful of guards. Almost the entire population of Aberdeen had been at the muster to gape at the visitors from Beyond.

Somehow, in the heat of combat, John had shaken off the better part of his fatigue and was among the first of the defending clansmen to arrive on the scene of action.

It was a debacle.

The Aberdeen clansmen and young men who had been guarding the herds, had been cut down or driven off and the Thompson raiders, ever top men in this sort of thing, had decided upon an offbeat strategy. All had dismounted from their own tired horses and thrown their saddles upon fresh mounts. Each was now busily rounding up a half dozen or more captured steeds and were driving them off, leaving their own jaded mounts behind.

Here and there, hand-to-hand combat was taking place, claidheammors flashing, as the Thompson clansmen attempted to break off the action and make their escape. They knew themselves outnumbered, representing but one clan, while in Aberdeen there were a full eight. Those that were escaping were heading in a dozen different directions, rather than remaining in a single, easy to pursue, group. They were scattering.

John of the Hawks gritted his teeth even as he dashed into the fray. On wearied horses, the Aberdeen clansmen would have their work cut out catching up with all the raiders. And those who they did successfully trail, would, when caught up with by revenging clansmen, simply desert their booty and ride for it back to the safety of their own town of Caithness.

Aiii! He came up upon one of them who was having trouble with a Clan Clark steed he had captured. John knew the animal well, a highly trained stallion which fought against having any other on his back save his master.

Shouting the battle halloo of the Hawks, John brought up his carbine to fire. The other rode toward him, swinging his claidheammor, desperately fighting the animal, tearing its mouth with the heavy raiding bit, deliberately designed for use on captured steeds. He shouted the halloo of the Clan Thompson and slashed at the man on foot.

John caught the blade on the barrel of the carbine which he only now found was empty. He dropped the gun, tore his own claidheammor from its scabbard.

The horse reared up, shrilling its fear and anger at being dominated by a stranger.

John darted under its belly, coming up on the other side of the desperate enemy clansman. He slashed upward, cutting deep into the other's side. Slashed again, before the man could turn to defend himself.

The other's sword dropped from his hand. For the briefest of mo-

ments, he tried to keep his seat on the plunging animal. Then he fell, crashing to the ground.

John of the Hawks was up and onto the steed, taking over the position of stranger in the saddle. But at least he knew the animal's name and had, in his time, petted it in admiration.

Now, even as he battled, he spoke soothingly, calmly. Called it by name. Resorted to knees, rather than overly heavy use of the bit. Around him, as he fought to dominate the horse, the battle faded off.

Most of the Clan Thompson were escaping, heading in all directions as the Aberdeen clansmen attempted to catch horses, saddle them, get on with the pursuit. Unhappily, little harness was available, most of it being back in the town. The Hawks, Clarks, Fieldings and other defenders of Aberdeen, scrambled up bareback in an excited attempt to pursue the thieves.

John was one of the few with a saddled mount and a fresh one at that. He darted his eyes over the ground, looking for his carbine. He couldn't see it. He and the horse had moved over a considerable area in the past few minutes.

No matter. He had claidheammor and skean, weapons enough for any clansman. He headed after the foe, at full gallop, blade in hand.

But then his eyes narrowed. This was what the enemy had in mind. At best, with such tactics, he would catch one, or at the very most, two of the raiders. And even then, he might be fought off by a Thompson who still retained his firearm.

His mind raced. There must be something more effective, than chasing off after a retreating enemy and vainly shouting his battle halloo. In fact, there was a ludicrous quality to it all and without doubt at the next meeting of the Dail, when the clansmen of all the confederation's Phyla recited their victories, there would be great laughter on the part of the Clan Thompson at the expense of the men of Aberdeen.

And it suddenly came to him that much of the laughter would be directed at him, John of the Hawks, who, although he had stolen three horses, had not been able to retain them for more than a few hours, so quick had come the revengement.

There must be something more effective.

And, yes, there was. The raiders were scattering, but in order to return to their own town, they must sooner or later, head in that direction, after eluding pursuit.

As a Hawk scout, and as a young herder of the cattle, John knew this countryside as well as he knew the longhouse of his birth. He cast his eyes around quickly, trying to spot one or more fellow clansmen that he could bring into his plan.

But there simply were none. His fellows who had also acquired mounts were taking off after the enemy, in all directions. He must go it alone.

John shrugged and dug heels into flanks and headed out over the countryside. Any of the Aberdeen clansmen who saw him must have thought him either daft or a slink, for there were no enemies, herding their booty, going in this direction. He grimaced, knowing the dishonor that would be his, did his plan fail.

He rode hard, pushing his newly acquired and dominated animal—over field, over heath, through clumps of trees, up and over the hills. *Aiii.* He knew this land well, but never had he ridden it at such breakneck speed.

The hills grew higher as the horse began to weary, and shortly he was in a narrow valley—narrower and narrower.

Until at last he reached his destination. Reached it and passed through the narrow way.

On the far side of the pass, he leaped from the horse's back, took its reins and hurried it into the shelter of the patch of trees to one side. Tethered it. He considered momentarily binding its mouth so that it could not whinny at the sound of other horses approaching. But no, the animal was too weary from its hard gallop to be interested in the company of its fellows.

John took in hand the scabbard of his claidheammor, to keep it from tripping him up, and began his ascent of the steep hill at a trot.

At the top, at the spot he'd had in mind from the first, he looked back over the way he had come. And doubts hit him. There was nothing in sight—not so much as a flurry of dust. He had, perhaps, miscalculated.

But no, how could he have? Given scores of Thompsons scattering, and then converging again on their home town of Caithness, surely at least one enemy clansman and his stolen horses must come through here. Simply must.

He settled himself down to wait, sitting on a rock. At this stage he would not be spotted. He considered his plan of action, when and if the raider, or raiders, did appear. He cursed himself, now, for not having taken the few more moments of time it might have needed for him to have located his carbine.

A more beautiful ambush than this could hardly be asked. The fleeing raiders would not be thinking in terms of Hawk clansmen *before* them, but would, undoubtedly, be constantly looking over their shoulders. Given a carbine and John could knock at least two off their horses before they could take defensive measures. But there was little profit in dwelling upon that. The fact remained that all the weapons he had were his heavy claidheammor and his skean.

He thoughtfully picked up a large rock and hefted it. But no. The foe would pass directly below, and it was possible he might hit one in the head—possible, but hardly probable. He was no great marksman with a thrown stone. There was no

occasion for him to be. The youth of Aberdeen played with wooden weapons, not balls.

And now, at a distance, he could spot a cloud of quickly rising dust.

Aiii! He had won!

At least, to this point he had won.

Just in case, he gathered half a dozen suitable heavy stones and put them ready to hand. Then he crouched behind his boulder. It would hardly do for the other, or others, to be keen enough of eye to spot his movement up here.

The newcomers were approaching at a pace and he could make out individual forms. Four horses and but one rider. As a now full-fledged clansman, or, at least, one suffered to sit among the clansmen until being formally raised up at the next regular muster, he couldn't admit relief that there was only one foe with whom to deal, but deep within the relief was there. In spite of his efforts of the past two days, he was a young man still with neither the physical capacity nor the experience of a Thompson clansman.

He ducked lower and peered from behind his defense. And now he scowled. There was something he couldn't quite put his finger upon.

And then it came to him. The lead horse, scurrying along before the others, herded by the raider, was his own personal steed, stolen with the other Hawk animals in the pastures. And, added wonder, now that they came closer, the rest were the three he had stolen himself, at the stream, precipitating this whole affair. He was taken aback. It was an unexpected coincidence.

He tried to measure the enemy clansman who was pounding along hard behind the rapidly tiring beasts. And again there was relief. Unless he was mistaken, at this distance, the other could be little older and larger, than John himself. Possibly not even a full clansman, but simply a youth brought along to help with the stolen herds.

John gathered himself. His plan of action was now clear. He put his claidheammor down beside him and took up two of the stones.

The fleeing group had entered the narrow way, slowed slightly by the rocky character of the pass. And on they came.

Suddenly, he heaved the rock in his right hand at the first, riderless, horse, even as it passed beneath him. He quickly shifted his second stone to his right hand and threw it as well.

The lead animal screamed terror and reared, slowing all those behind, who also took fright.

He jumped to his feet, grabbed his skean from his belt, and leaped. Luck was ever with him. He launched himself full onto the back of the Clan Thompson raider, who, completely startled by the unexpected attack, toppled from the horse, John still atop.

While they were atumble on the ground, John raised the knife, preparatory to the stab. But it was un-

called for. The enemy was unconscious, a cut on the side of the head that had been taken in the fall.

But there was another reason for the stay of John of the Hawks' blow.

There was no stronger ban than that against injuring a woman.

IV

And as he came to his feet and stared down at her, he realized that she was not even a woman but merely a lass. Certainly no older than himself.

She wore the kilts of the Clan Thompson and her hair was cut short in the style of young men. And at her side was a skean. He gaped at her. In all his life, he had never heard of a lass so de-sexing herself. Shameless, Thompson women might be rumored to be, but most certainly he had never seen one at the yearly Dail, dressed as a man and carrying a weapon.

The horses, all trained battle steeds, had come to a halt at the far end of the pass. John, deciding she would be out for a time, at least, or, if she recovered, would still be of little danger, went and secured them and tied them where he had left his own animal. Then he went to the hill crest and regained his claidheammor and returned it to its scabbard.

He strode down then to where he had left her.

She was beginning to regain consciousness.

He had no water, or he might have bathed her head a bit. As it was, he sat on a boulder and waited, still scowling disbelief. So far as he knew, in all the history of his Phylum, never had a woman, armed or otherwise, participated in a raid. There was even a puzzling aspect about it. How did one defend himself against a lass? Suppose she came at you with carbine, claidheammor or skean. What did a clansman do, turn and run? What else was there to do?

But now she was stirring. Stirring and moaning. John of the Hawks squatted down beside her, lifting her head to his knee and stroking the forehead, awkwardly.

By the Holy, she was a pretty thing! High forehead, reddish hair, cut short though it was, a generous mouth, perhaps just a shade overly wide. Teeth that were white, white; a firm chin.

And, suddenly, blue eyes staring, unbelievingly, up into his own.

She snatched quickly for her skean.

John took it from her as gently as the situation warranted and threw the dagger down the pass.

He said awkwardly, "I would not harm you, lass. We of the clan Hawk do not harm women."

She sat up now, and John came to his feet. He scowled at her, not knowing what to say. What did a clansman say, upon capturing a raider who turned out to be a woman—a lass?

She stood up, too, and looked at him scornfully, but then began to sway. She put a hand to the cut at the side of her head, brought it back and looked at it and seemed about to swoon at the sight of the blood. There was not much, but it was blood.

John stepped forward and put a hand about her waist.

She began to react in fear but he said gently, "Easy, I wouldn't harm you. Come over here and sit on the heather a bit. You'll get over your dizzy spell."

She suffered him to take her over to a softer area and to seat her more comfortably than would have been possible in the stony pass.

He waited patiently, for long minutes, and finally realized she was peering at him from between the fingers she had been holding over her eyes.

Seventeen perhaps only sixteen, he decided. What in the name of the Holy did the Thompson clansmen have in mind, bringing such a child on a raid? He was conveniently forgetting that he himself was not yet eighteen, and, except in an emergency, at the time of a raid, confined to such activities as holding the horses of full clansmen while they fought on foot, or bringing up ammunition or water, perhaps assisting the wounded.

He said, trying to force gruffness into his voice and failing miserably, "Now tell me all about this."

"About what?" she said defiantly.

"Come on, the proof is there before us. You are armed. You are on a raid of the Clan Thompson against Aberdeen."

She had taken her hands from her face and was now frowning at him. She said slowly, "And you are the young Hawk clansman who stole our horses at the river bank."

He grunted. "And counted coup on three of the Clan Thompson who had been stealing Hawk cattle."

She said, wonderingly, "But you are such a young clansman to have done so much."

There was no answer to that, though he wished he looked older. She was as pretty a lass as he had ever seen, he realized. And it came to him that it would not be too many years before he would be faced with stealing of a bride from some clan other than the Hawks.

She said, "What will you do with me?" But there was only the faintest of fear of the unknown, far in the background. The girl was no slink, but, then, she had already proven that.

John said, "First, I will demand you tell me how you are here, under these circumstances."

Her mouth tightened stubbornly, but he held his peace, waiting, and finally she spoke. She said, "I am Alice of the Thompsons."

He nodded to that. "I am John of the Hawks."

"I was but one lass, in a family of five sons."

He couldn't see what that had to

do with it. Most families of Caledonia had at least as many children as that, and a large percentage of males was certainly preferable, considering the number of casualties taken by the clansmen in raids and in defense of the flocks.

But she was going on. "It was not a family for a lass. My mother had been captured in a raid from the Edin Phylum, and I was raised by my kin—and my brothers. I was more prone to play with the toy claidheammors than with dolls and other nonsense of girl children. Until I was all but a woman, this was true."

"Go on," John said.

"So it was that when my five brothers were killed in a raid of clansmen from Aberdeen, attempting to protect our herds . . ."

"Five!" John said blankly. "All five in one raid?"

"All five. Two came home that night but with wounds. They died before the week was out, when the fleshrot set in."

"Aiii, lass!" John murmured.

She took a deep breath. "I was still a child but I took an oath that I would have my revengement on Aberdeen. I took it before my clan elders, and none laughed in their pity. But as the years went by, over and over I told all that one day I would have my revengement. And I set aside childhood and practiced as best I could and as best my kin would allow me with claidheammor and skean and carbine, though it was seldom indeed I could cozen a clansman into allowing me to use his firearm."

John of the Hawks was staring at her.

She took another breath. "And always, after I had grown to womanhood, I pleaded with them to take me on their raids. And sent praise to the Holy that it would be so.

"Until, finally, perhaps worried of my health, the sachem and caciques discussed the matter and one was appointed a spokesman to remonstrate with me, since it had become a scandal in the Caithness Phylum and I made all uncomfortable. When I held to my oath, then he demanded if I would be satisfied with but one raid against Aberdeen, and would then subside, let my hair grow long and participate in the activities of women."

"Go on," John said, his eyes still wide in disbelief. He had never heard such a tale. Surely it could never happen in Aberdeen amongst his own kin.

She said bitterly, "I was not to find out until later that the raid was a minor one, deliberately planned for my sake. We rode to the outskirts of the heath of Aberdeen . . ."

"And the preserves of the Clan Hawk," John muttered.

"Yes. And there we proceeded to do no more than round up and butcher the cattle. Far from danger of meeting the clansmen of Aberdeen."

"But that was when I, on a long scout, found you."

"Yes. And counted coup on Will, Raid Cacique of the Clan Thompson, and two of his sagamores."

"Aiiii!" John blurted. This would be something to relate to the muster when he was raised up to full clansman.

"So then," she said, "all was forgotten about the original purpose of the raid. The whole party was gathered together and we rode at full pace for Aberdeen—Will, the Raid Cacique, riding ahead in a furious rage."

She shrugged. "You know the rest. Your herds were practically unguarded. We rounded up the horses and each member of the party was given a few head to herd back to Caithness. Will was revenged, at least in part. If mine, alone, of the horses have been recaptured, then it is the biggest raid known in the memory of living clansmen."

"Yours will not be alone," John said sourly. "But I will admit, it was a gigantic raid—and well executed." The last was hard to bring out.

"And now," she said, her voice again bitter, "I suppose you will return me to Aberdeen to become a clanless one in your household."

For a long time he stared at her. Finally, he shook his head. "No. You were never meant to be a kitchen drudge. Before the week was out, you would be stolen from our longhouse by a Clark, or Fielding, or one from the other clans of Aberdeen."

"What difference that to you? They would have to pay the bride-right, and a few horses or cattle—I would surely bring a few horses—must be welcome to a clansman as young as yourself. I see that you are already wed. Or is it that you do not find pleasure in my appearance, yourself?" There was a wistful quality in her voice, as she touched a feminine hand to her hair.

"I am not wed," he said gruffly.

"Aiiii," she said, her voice bitter still. "I am not so sure that the clansmen of your Phylum will find me desirable either, John of the Hawks. Undoubtedly, the younger men will think of me as you do. If I am honorably stolen by one of your Aberdeen clansmen, it will be by one of the older, and perhaps incapacitated by wounds, clansmen, who desire a strong lass who can be driven to hard work at his hearth and in his quarters."

John of the Hawks had come to his feet again. He stared down at her for a moment, then walked over to where he had tethered the horses and returned with the one upon which she had been riding when he had leaped from his ambush.

He held the reins to her.

She looked up at him blankly.

"Return to Caithness," he said. "I am not as yet raised up to full clansman, Alice of the Thompsons, and will not be until the next muster. Thus, I am not eligible to steal

a bride. And, if I returned with you to Aberdeen, someone else would take you before it was meet that I could. So, return to your kin, Alice of the Thompsons."

She looked bewildered.

He added, "And I will come for you another day."

She blushed then, as a good lass must. "If you come, my kin will defend me."

He twisted his mouth in amusement.

"And if they fail," she insisted, her head high, "I will take my own life with my skean."

"I have heard of the tradition," he said with amused skepticism, "but I have never heard of it happening. Besides, at the next meeting of the Dail I will ask the Sachem of the Hawks to confer with the Sachem of the Thompsons and honorably arrange for the stealing of Alice of the Thompsons, arranging in advance with her clan for suitable payment of the brideright."

In a sudden, seemingly uncalled for fury, she raised her hand to slap him.

But he was having none of *that*. He grabbed her strongly, and kissed her full on the mouth. She held tense for a long moment, then her mouth went soft, as though unwillingly. Finally, he released her and stood back, smiling.

She rubbed her hand across her mouth. "But . . . but, I am not your bride," she said in horror. "And it is against the ban."

He grinned at her. "It surely is."

She turned and jumped astride the horse, and glared down at him in feminine rage. "I have been shamed," she snapped.

"I doubt it," he told her. "For none know save you and me."

She dug furious heels into the steed and was gone.

And John of the Hawks stood and watched after the woman he loved until she was long out of sight.

Largely, as he rode back to Aberdeen, herding the recaptured three animals, his mind was on Alice of the Thompsons, as was to be expected of a young man yet to be wed. But he dwelt also on the men from Beyond, and as the distance was passing far for one who rode and herded animals, he had ample time to consider ramifications.

The weapon which the one named DeRudder had demonstrated was cause for thought. On the face of it, the man from other worlds was not adverse to using the frightful thing. And what had he said? *I can wipe them all out with one sweep of this.*

John suppressed a shudder, as unworthy of a clansman, but couldn't help consider what a handful of such weapons could accomplish on a raid. The men from Beyond named themselves explorers, and, if John understood the word correctly, were on a peaceful mission. But suppose they had come in raid? Who could resist them, with such weapons?

There were other aspects. On the face of it, the otherworldlings were far and beyond the Caledonians, whose most advanced vehicle was a simple two-wheeled cart. Even John could envision the span between a horse-drawn cart and a craft that could cross space.

The light was fading rapidly now and his exhaustion came upon him, and he could make it no further. He drove his animals to a hidden gully, hobbled them, and threw himself to the heather.

When he awakened, it was well toward noon and he was well refreshed though he had slept upon the ground with not even a cloak. Thus is youth, and especially on Caledonia, where, long since, man and nature had eliminated the unfit.

He retrieved his horses, who had not wandered far in their search for graze, in view of the hobbles, and took up again his ride to Aberdeen.

As he drew nearer to the town, he occasionally spotted others, undoubtedly fellow clansmen, heading in the same direction. A few herded horses, but most rode dejectedly without.

Alice of the Thompsons had been correct. It had been a raid of raids and so far as the clansmen of Aberdeen were concerned they had counted few, if any, coups, killed few of the raiders indeed, and had recovered but a fraction of their stolen animals. It was a black day which Aberdeen bards would never sing, though most certainly those of Caithness would. He winced to think of the coming Dail, in spite of his own glory.

Closer to the town, he met his friend, Don of the Clarks, who, besides the mount he rode, herded another animal before him. It was not a battle steed but an older draft animal, and there was an air of dispirit on the face of the other.

John hailed him, keeping any elation from his voice, for John of the Hawks was maturing rapidly. His own three recaptured steeds were sleek, in their prime, and well trained. Above all, they were not property of related clansmen, and hence it was not necessary to return them to former owners. They were enemy horse, and hence John's own, save, of course, the one he rode.

Don asked, "Where did you find them?" He was of John's own age and they had grown up together, shared many an experience in common. However, somehow, he appeared strangely young now to John —callow perhaps.

The other was not a Hawk, so had he willed, John could have lied to him. However, he made a half-truth, realizing only now that he hadn't the slightest idea what story he would tell the sachem and the war cacique of the Hawks.

He said, "I took them from one of the raiders. All except one fast steed upon which the Thompson hurried off in the direction of Caithness, slightly wounded."

"Aiii!" Don of the Clarks said in

disgust. "If only I had such a story. I spotted not even one. I found this ugly nag, straying. The Holy only knows to whom she belongs."

John nodded. "There will be shame in Aberdeen, this day."

From there on they rode in glum silence.

At the gate, the warder and his men greeted them with compliments, by which John assumed that few indeed were the clansmen who had done even as well as had he.

They turned their mounts and recaptured animals over to youths to be led back to the pastures and headed, after brief farewells, toward their respective longhouses, carrying their horses' harness and their weapons and coup sticks.

Bemused, both with thoughts of the action of the day before and his experience with Alice of the Thompsons, John made the same mistake he had on the previous afternoon. He automatically headed for his own family quarters and the room in which he had been quartered for the greater part of his life, forgetful, for the moment, of the fact that the apartment had been turned over to the strangers from Beyond.

He caught himself almost immediately, though evidently the otherworldlings were not using his chamber, the rest of the apartment being ample for their needs. He turned to leave the room by the door which led to the long hall.

But once again he heard voices.

He hesitated. Eavesdropping was beneath the dignity of a clansman, though there was no definite ban nor even an established custom.

However, he told himself, in excuse, they were not members of the Clan Hawk, nor even of the Aberdeen Phylum. And, for that matter, their strangeness was such that they bore looking into.

He pressed his ear to the door that led to the living quarters.

As before, the others were obviously alone and once again in full debate. It would seem that these men from the League, as they called it, were as mystified by the institutions of Caledonia as John and his fellow Phyletics were by the ways of the men from Beyond.

He decided it was DeRudder's voice he was hearing. The second in command of the *Golden Hind* was saying, "And I claim we better get out. Did you hear what their big mucky-muck said at the muster? They've got a traditional three days of hospitality for the traveling stranger. All right. What happens after the three days are up? And that's today, mind you."

One of the other voices—Harmon?—said sneeringly, "What could happen? We've awed them. They don't know what to make of us."

The Skipper's voice said slowly, "No, we haven't awed them. They don't know what to make of us, but we haven't awed them. You know

what they're busily up to now?"

There was no answer to his question and the Skipper went on. "They're rounding up a raiding party, to replenish their herds of horses."

DeRudder said, "You mean they're going to go after this gang that hit them yesterday?"

"No, not at all. One of the war caciques told me that wouldn't do. The Thompsons, or whatever their name was, would be prepared and ready to defend themselves. So they're going to attack another town. They're going to raid somebody else that they haven't had any trouble with recently."

"Krishna!" a nervous voice said. "What a people. I'm in favor of getting back to the ship. I wish we'd brought the skimmer with us instead of the groundcraft."

Harmon said, "I'd like to stick around and see if there isn't some way of changing their minds on signing over exploitation rights to their mineral resources. We could offer them just about anything. They're practically poverty-stricken so far as commodities are concerned."

The nervous one—Perez, John decided—said, "What would we do with it, if we got it?"

It was Harmon's voice again. "Don't be empty. We'd ditch this so-called exploratory cruise and head for some of the nearest frontier planets, those with early free enterprise type economies. Can you imagine being able to dump an almost limitless amount of platinum onto an open market? And do you realize the scale of living of the really rich on those planets? Why, the Caesars never had it so good."

The Skipper said thoughtfully, "Harmon's right. Given the concession, we could find means of profiting by it. The problem is getting the concession."

John of the Hawks was scowling. About half of this, he didn't understand at all.

It was DeRudder's turn. He said, "I'm in favor of immediate return to the ship, too. We've already fouled things up here, in trying to learn what makes them tick. We'll have to go on to some other town. Some other Phylum, as they call it. We've got a little background now and can do better. By the way, do you know what Phylum means?"

There was no answer and his voice took over again.

"It means tribe, in this connection, if I'm taking it from the Greek correctly. I would say that they've got a system of several clans that make up each Phylum. These Phyla, in turn, are loosely made up into confederations. From what the old boy said yesterday, there are such confederations all over the planet. He mentioned knowing of twenty-three others."

"So?" the Skipper said.

"So we'll set down in the territory of some other confederation and start all over again."

"Start what?" the Skipper asked.

"Subverting institutions, to put it bluntly. Somewhere we'll find a Phylum that's just taken such a licking from a neighbor, that they'll accept our offer of repeating rifles."

Harmon said, "By the way, where are we getting anything as primitive as repeating rifles and submachine guns? The only place I've ever seen such things was in historical fiction shows."

"Don't be a dully. We could take half a ton of platinum to any of the frontier planets and they'd tool up and whomp them up for us in a week's time."

"Why not more sophisticated weapons?" the nervous voice said.

"You're being particularly dense today, Perez. We don't want to give them the sort of firepower that'd enable them to work *us* over."

"I guess you're right."

The Skipper's voice said, "And what if we find the same thing elsewhere that we ran into here? That none of these Phyla, or whatever you called them, will sign over their mineral rights?"

DeRudder's voice went suave. "Skipper, there are ways. Obviously, we must abide by the League Canons, but at this distance, that will be no problem. And we can take a page from early Earth history. There are ways for, ah, civilizing backward peoples if they want to be civilized or not. Remember the European pilgrims and pioneers and the Amerinds? For instance, I note that they have a distilled spirit here they call *uisgebeatha,* and, believe me, it's potent. Very well, where you have potent nip, you've got people who are hooked on it. All we have to do is find a sachem, or so, hooked on *uisgebeatha,* get him binged and have him sign over mineral rights to us."

Harmon said, his voice expressing interest, "How do you know that under local laws the sachems have such power?"

"What do we care? They're kind of a chief, aren't they? With the papers signed by one or two sachems, we can go to one of the less punctilious planets and get some military beef to back up our legal rights."

The Skipper said heavily, "Mr. DeRudder, I can see you missed your calling. But what if we can't find any such sachems?"

DeRudder laughed. "In that case, Skipper, maybe we'll elect one or two of our own. Once the chaos starts, who can say who the *legal* sachems are, and who aren't?"

"Just a minute," Harmon said abruptly. His heavy boots sounded on the floor, as he moved rapidly across the room in the direction of the door behind which John of the Hawks stood.

V

But some instinct had warned John, a split second before. He spun and scurried across the room to

the door to the long hall and was through it before the other could expose him.

In the hall, he shot his eyes up and down, having no immediate plan of action. Where would he find the sachem of the Hawks? Obviously . . .

He was saved the problem.

Through the door to the living quarters of his family stepped DeRudder. On spotting John, he whipped his sidearm from its holster.

"All right, boy," he said. "Step in here."

John of the Hawks looked at him. "I have no fear of your weapon," he said. "A shout and my kinsmen will be upon you."

"But you will be very dead by that time, boy."

"I am not afraid to die. I am a Hawk."

DeRudder hefted the gun up and down. "However, you have seen what the weapon could do. Would you expose your relatives to it?"

John thought about that only briefly. He stepped forward. DeRudder stood to one side, the gun trained, as John entered the room where the others from Beyond were gathered.

He stood there before them, defiantly.

DeRudder closed the door behind him and said, "The overgrown dully's been snooping. What'll we do with him?"

"Let's get out of here," Perez said quickly. "The fat's going to be in the fire before we know it."

The Skipper looked at John, remaining seated in the same chair he had been in the day before. He said, "How much did you hear, son?"

"Do not call me son. I am not kin of yours."

"Oh, belligerent, eh? Not quite the same polite boy you were yesterday." The Skipper looked at DeRudder and then to the other two of his officers. "If you've got anything around here, gather it up quick. We're going back to the *Golden Hind*."

DeRudder jerked his head at John. "What do we do with our empty friend, here?"

The Skipper considered it, his face dour. Finally, "Bring him along. We can use a hostage. Besides, I'd like one of them to question a little more. Half of this whole setup leaves me blank."

"Let's get going," Perez said.

"I refuse to go with you," John said.

DeRudder chuckled. "Boy," he said, "you remember the beam that came out of this gun when I shot it up into the sky? Believe me, with it, in ten minutes I can cut down this whole pint-sized village of yours."

The Skipper said gruffly, "And it's not the only gun we've got on hand, son. Come along."

John said, "Ten minutes is a long time. The clansmen of Aberdeen are not slinks."

Harmon grunted contempt. "And

they're not in Aberdeen, either. Practically nobody but women and children are in Aberdeen. Half of your men are still out chasing Thompsons, or whatever you called them. The other half have already taken off to raid another town. You Caledonians seem to spend most of your time butchering each other."

"So," DeRudder said, "if there's any fighting, it'll largely be with women and children, eh? Well boy . . ."

"I will come," John said.

DeRudder made a mocking gesture with the gun. "After you, John of the Hawks. Our ground car is parked behind the building, in that area you use for your saddle animals that are in immediate use. Take us there by the shortest route. And careful, boy. The slightest trick and we unlimber our artillery and shoot our way out."

John didn't know what the word artillery meant, but he could guess. He said stiffly, "I told you I would come. And even though you are not my clansmen, I do not lie to you."

He led the way, out into the long hall and down it to the entry which led to the paddock. They passed only three or four fellow residents of the Hawk community house as they went, and none of these clansmen. Harmon had been right. The men of the Clan Hawk were highly occupied.

In the paddock, John's eyes widened whether he would or not. The vehicle there was a far cry from anything he had ever expected to see on Caledonia. It was of metal, streamlined and beautiful. There were two doors, one on each side, and several windows. There were no wheels, which mystified him.

Perez opened one of the doors, saying, "Let's get out of here," although obviously that was exactly what they were already doing.

DeRudder said to John, "Take off that belt, boy. I think we'd better relieve you of that set of toad stickers."

John kept his shame to himself as he turned over his claidheammor and skean.

The Skipper motioned him inside, and he entered the vehicle from Beyond and took a seat in the rear. There was seating for ten persons, and ample room for luggage, or whatever, to the rear.

The others got in, the officer named Harmon behind a set of bewildering dials, switches and a small wheel. In spite of the position he was in, John of the Hawks was fascinated.

The others settled themselves and Harmon dropped a lever. There was a faint hum and John's stomach turned over in surprised rebellion as the heavy craft lifted slightly from the ground. Harmon trod upon another gadget and they began moving forward.

The vehicle from Beyond progressed slowly to the entry of the paddock and then, as they entered the broad street before the long-

house of the Hawks, sped up. They headed for the Aberdeen main gate, going faster still.

The gate was open and, as they passed through it, John could see the warder, wide-eyed, staring at them. Only at the last minute did he see that John was in the craft, along with the otherworldlings.

Once in the countryside, Harmon flicked another lever and the craft rose another foot or two and increased speed considerably. They were now progressing as fast as any horse upon which John had ever ridden. He set his facial muscles, hating to show these others that he was amazed. The countryside sped past in bewildering rapidity. In a matter of moments, they had covered ground that would have taken a horseman hours.

DeRudder, who still carried his weapon in his hand, albeit loosely, nonchalantly, grinned at John. "Now if that sachem mucky-muck of yours hadn't been so empty, we might have made a deal to turn over a few of these ground cars in return for platinum rights," he said. "Can you imagine the advantage of taking one of these on one of your raids?"

John said, "Undoubtedly, the Keepers of the Faith would have decided it was against the ban."

The Skipper said to him dourly, "Everything seems to be taboo on this planet. Why should repeating rifles be against the ban?"

"That, as all bans, is in the hands of the Holy," John said without inflection.

"Great," DeRudder grunted. "But somehow the Holy, by whatever name you want to call him, usually makes with his words of wisdom and his threats through the lips of some intermediary or other. Such as your Keepers of the Faith, or bedels, or whatever you call them."

John had never thought of that aspect, but he kept his peace.

DeRudder said in irritation, "So what do your Keepers of the Faith teach you was the reason for a ban against rifles that shoot more than once?"

John of the Hawks had never been particularly reverent; however, he had done the usual amount of reading of the Holy Books when he was taking such schooling as Aberdeen saw fit its youth assimilate.

He said, "It is written that in the misty days, shortly after the *Inverness Ark* came from Beyond . . ."

"The what?" the Skipper said sharply. "What was the name of that ship?"

"Ship?" John said.

"The name of the, well, whatever it was you came in from, uh, Beyond?"

"The *Ark*," John said. "All of the people of Caledonia came in the Holy *Inverness Ark*."

"Krishna!" the Skipper said. "I remember now. Possibly the first pi-

oneer craft ever to be lost in space. Crewed largely by colonists from northern Great Britain."

John didn't know what he was talking about.

DeRudder said, "Go on. Why the ban against a gun that shoots more than once?"

John continued. "In the misty days, there were few people in all the land, and only slowly did the first Phylum multiply. And at that time it is written that there was strong ban against man raising his hand to man, even though honor was involved. All lived in peace, as all will live in peace when the Land of the Leal is achieved."

DeRudder said, "Great. But about the ban against repeating rifles?"

John said, "But when the people grew so numerous that there was no longer space for all the herds, nor sufficient game for the hunters, then there was a meeting of the sachem fathers, of each clan, and it was decided that half the people, half from each clan, would gather together and move far off to a new land. And so it was. So that now there were two Phyla, rather than one. And time passed and still the people grew in number. So both the new Phyla split and half their number moved away to new lands."

DeRudder was staring at him. "I'll be damned. So finally, you spread over the whole planet, tribe by tribe, splitting as soon as there got to be so many that your primitive economies were fouled up by overpopulation."

John didn't understand that. For that matter, he was largely reciting what he had always considered legend, or myth, and much of it wasn't clear to him. He went on.

"But then, as the number of the Phyla grew throughout the land, man began to ignore the original ban against raising hand against his fellow man, and the raids began. So it was that the Keepers of the Faith and the bedels gathered and it was revealed to them by the Holy that there must be bans to control the relationship between the Phyla. So it was that it was ruled that it is more glorious to count coup on man than to kill. So it was that the weapons of all were decided upon, and a carbine must fire but one shot at a time, so as to minimize the number that might be killed in a raid. All this so that the population would not be decimated."

Harmon said, "There's the ship. Krishna! What's going on?"

They were coming in fast, and John's eyes bugged. The craft was double the length of a longhouse, and all obviously of metal. Could any clansman swallow the nonsense that such an object could fly between the stars?

But while he goggled at the vehicle from Beyond, the others were taking in the clansmen who, concealed by hillocks, or any other cover they could find, were firing their carbines at the huge spaceship.

When the groundcraft approached from the rear, the startled clansmen were up and away, scurrying for new cover, or possibly even for their horses.

"Bruces," John said contemptuously.

"What?" the Skipper said.

"Clansmen of the Clan Bruce," John said. "A whole clan of slinks."

"If that means coward," Perez said, "I'd hate to see a hero on this planet. Here they are, attacking a spaceship with nothing but single-shot rifles."

The Skipper said, "Take her into the port, Harmon. We don't want to get out here, there might be some of those sharpshooters still around."

As they got nearer to the *Golden Hind* they passed over several kilt-clad bodies, Bruces who must have fallen in a charge on the ship.

To John's amazement, as they approached the rearing otherworld spaceship, it seemed to grow even larger than his first estimate. It was at least, in cubic area, the size of three or four longhouses. And as they drew near, slowing now in speed, one of the metal walls slid open and where earlier he could have seen no indication of an entry port, now there was one, and a ramp of metal to ascend to it.

Harmon expertly jockeyed the groundcraft up the ramp and they slid into the interior.

He flicked his lift lever and the vehicle sank to the metal flooring. Harmon stretched and yawned. "Home again," he said sourly.

Perez opened a door, manually, and stepped out. Another otherworldling came hurrying up. He was dressed as were the four who had come to Aberdeen, but there was a bandage around his head, and his arm was in a sling.

When all, including John of the Hawks, had disembarked, the Skipper scowled at the newcomer. "Where is the Chief?" he growled. "What in the name of Krishna's going on around here, Wylie?"

"The engineer's dead," the one named Wylie said excitedly. "Where've you been, Skipper? All hell's busted loose since you left. We were afraid they'd got you. T. Z. Chu's dead, too. If you hadn't come back, we couldn't even've lifted off."

"Dead?" Perez said in shock.

Wylie said, darting a glance at John, but then coming back to his fellows, "The raids started after you left. It was the first one, got us. They came charging in on horses, shooting, and with these big swords, and they caught the engineer and Chu, outside. I tried to come out to help and they nicked me. Jerry and I managed to run them off with flamers, but it was too late for the chief engineer and T.Z."

The Skipper turned to John coldly. "I thought there were three days of hospitality for traveling strangers."

John said, "The kilts on those clansmen outside are those of

Bruces. They are not of our Phylum. You are on Aberdeen land. We have granted you the three days of hospitality, in spite of your actions. But the Clan Bruce is not affected by the ban in this case. Do you know nothing at all of honorable usage?"

The Skipper turned from him in disgust and back to the wounded man from Beyond. "What else happened?"

"Jerry and I have been fighting them off ever since. At first we bowled them over like nothing. But they're smarting up now. They don't come within range of small arms, or, at least, not so we can see them. They just lay off and ping away at us."

Harmon said, "What harm can they do?"

Wylie said to him, "Nothing, against the hull of the ship. But we can't go out. They tried to build a big fire up against us last night. I tell you, they're tricky."

John was taking all this in, without overmuch surprise. The men from Beyond were fair game for any clansman save those from Aberdeen, and now that the three days were up, game for Aberdeen, too.

The Skipper grimaced. He thought about it. In irritation he snapped at DeRudder, "Put this dully in confinement, somewhere, and everybody come on into the lounge."

DeRudder upped his weapon, and motioned to John with it.

John preceded him down a long corridor of metal. John of the Hawks had never seen so much metal in his life. It gave him a strange feeling of being shut in, a disturbing feeling. The halls were very narrow compared with the spaciousness of those in the longhouses. The ceilings were much lower, and he felt as though they were squeezing him down. He wondered how long it must take to come from the Beyond to Caledonia, and wondered how the otherworldlings could bear to be confined for whatever time involved. Did they not feel the demand to dash outside and see the sky above, the distances stretching away? It would have been a horror to him. Indeed, it was a horror, even in so short a time.

He was conducted to a small compartment—smaller even than his young man's quarters in the longhouse—and ushered inside. The door was closed behind him, and he heard a noise that was a lock, though this he didn't know, the institution of locked doors being unknown on Caledonia.

And then came the most trying ordeal in the seventeen years of John of the Hawks. For confined though the corridor of the *Golden Hind* might have seemed to him, it was as all space compared to this small hold which measured little more than his height, in length, breadth and depth.

His soul screamed against his imprisonment, as that of the eagle or

hawk must when encaged in a space so small it cannot spread its wings. As that of the timber wolf must when brought to the zoo, from its woodland range.

All his tendency was to beat with his fists against the metal door and scream to be released, but the pride of a score of generations of clansmen came to his aid, and preserved sanity. He refused to play the slink before these foe.

VI

He found some release in closing his eyes and pretending to be in his own quarters. There was a cot, much too short for him, but at least he was able to recline. And finally sleep came.

He was awakened by a noise at the door and at first didn't comprehend where he was, but then it came flooding back to him.

It was DeRudder and had his weapon in hand. He said, "Come along, John, the Skipper wants to talk to you."

John came to his feet and followed the other out into the corridor. DeRudder gestured again with the gun. "That way."

They proceeded down the metal hall again, finally to emerge into a fairly large compartment, large enough, at least, so that the awful feeling of confined space was not quite so bad. There were various chairs, tables, and other furnishings and the four spacemen John had originally met were augmented by two others, Wylie and another. John noted with satisfaction that he, too, was wounded. Evidently, the Clan Bruce was doing fairly well—for the Clan Bruce. John slightly altered his opinion of their fighting ability.

The Skipper, who was seated at a table, a glass of some darkish liquid before him, said gruffly, "Sit down, John. We want to talk to you."

"I will stand, Skipper of the Fowlers."

DeRudder said, "Would you like a drink?" He added sarcastically, "Our nip isn't quite up to that *uisgebeatha* of yours, but it'll take the lining off your throat."

John of the Hawks was somewhat taken aback by the offer, but he said, "I will take no hospitality from you. You must realize that there is now vendetta between the Hawks and the Clan DeRudder, and my kinsmen will take revengement of my honor."

The Skipper said, "Don't be empty."

John looked at him. "And you also, Skipper of the Fowlers." His eyes went to Harmon and Perez. "And you two also. My kin will take their revengement on your clans."

Harmon snorted amusement.

DeRudder said, "Among other things, we don't have clans to fight feuds, even if we were primitive enough to have such an institution. We don't use the same type of rela-

tionship as you do, boy. You still evidently have a gens system. We of the League have been beyond that for a few thousand years."

"You mean you are clanless? You are without kin?" John's lips were going white. "And you laid hands on me? A Hawk. Dishonored me by taking me prisoner and stripping me of my weapons, rather than letting me face black death in honorable combat? How can my kinsmen take revengement if you are clanless men?"

The one named Perez shook his head. "The words are Earth Basic, but half of what he says doesn't come through. At least not to me."

Harmon leaned forward. "Why should your relatives, your kinsmen, want to revenge you?"

"What else could they do, after my blood has been shed?"

DeRudder wiped the back of his hand over his mouth in frustration. "Look. Nobody is going to shed your blood."

John of the Hawks stared at him in utter disbelief. Finally, "Then what will you do with me?"

"We'll turn you loose, of course."

"To return to Aberdeen, weaponless to the Hawks?"

"Why weaponless? You can have your weapons. All we want to do is ask you a few more questions about how this dully of a planet works."

John shook his head. "Why would you do this to me? What have I done to you that you should desire to make a woman of me? Why not count honorable coup of me, or at least kill me?"

The Skipper, who had remained silent during all this, stirred. "We don't want to kill you, son. We want a little more information, so that when we go up against the next town we'll know more of the customs. You're free to go, sword and all, as soon as we're through."

John said, his voice shaken. "I will follow you. Somehow I will follow you. The word spreads, throughout the countryside, and somehow I will learn where you are, and somehow I will follow you until I have killed you all, or you have killed me."

DeRudder rolled his eyes upward, in appeal to higher powers. "Great. So why don't we just kill you here and now, eh? And then we won't have the threat of you coming charging around a corner some day whirling that overgrown cheeseknife."

"This is to be expected," John said evenly. "And then my kin will come to find revengement and you will be killed as clanless ones are killed. And there will be no one to take revengement or pay the blood-right for you."

"It's still going past me," Perez muttered.

The Skipper was interested. He leaned forward, "Look, son, how many of you Hawks are there?"

John said, "We number some fifteen hundred full clansmen."

"All right. Now, suppose they all come charging after us. You have seen some of our weapons. Believe me, we have more powerful ones. If we were interested in wiping out those dullies outside, we could do it. Maybe we will, later. But if your Clan Hawk came charging up, we'd polish them off."

"Then," John said, "our two sister clans, the Clarks and the Fieldings would take up the vendetta."

The Skipper grunted. Finally, he shrugged and said heavily, "All right. And what happens when we have polished them off, as well?"

John of the Hawks was obviously taken back by the ignorance of honorable usage these clanless ones showed. He said, "Each clan has two sister clans. We have the Clarks and the Fieldings, as our sister clans. The Clarks also have two sister clans, the Hawks and the Davidsons. The Fieldings have two sister clans, the Hawks and the Deweys."

DeRudder was staring now, as well as the Skipper. "What you mean is, before you're through, the whole Phylum of Aberdeen would be in on the feud, or vendetta, or whatever you call it."

John looked at him blankly. "But, of course."

The Skipper sighed his disgust. "All right. Now, what happens if we wipe out the whole village of Aberdeen. Say we dropped a scrambler on it."

John said, reasonably, "Then our two sister towns, Elgin and Gleneagles, would take their revengement for us. And their sister towns, in turn."

Harmon closed his eyes in pain. He said, in complaint, "Carrying this on, I suppose ultimately your whole confederation would be involved. O.K. Do you realize that this ship could destroy every town in your confederation, without bothering to come down to the ground?"

"And then, Mister of the Harmons, our two sister confederations would take up the vendetta."

The six of them, unbelievingly, gaped at him.

At long last, the Skipper shook his head. He said, "This is fantastic. What you're saying is that ultimately a blood feud, what starts with our killing you—in self-defense, by the way—would involve every person on this planet."

John nodded. "You might slay as many as you say. You might slay by the thousands with your weapons that know no ban. But, if you plan to land anywhere on Caledonia, sooner or later the clansmen would take their revengement. They would charge you on their horses on the heath. They would rush you in the narrowness of the streets of the towns. They would snipe at you from a distance with their carbines. Sooner or later, men from Beyond, they would take their revengement."

The Skipper was disgusted, all over again. He said, "If what you say is true, then there wouldn't be a soul left alive on this whole world. Obviously, it's ridiculous. How do you end one of these vendettas, once it starts? It seems easy enough to start. There has to be some way of stopping them."

John said reasonably, "Of course. At the first meeting of the Dail, the sachems of the respective clans involved, meet honorably, and arrange for there to be made payment of the bloodright to the kin of the slain. Accounts are balanced. Then all are cleared of the need for vendetta."

"All right!" DeRudder said. "We plan to remain on this planet. We've got some business projects in mind. So we'll confer with your sachem and pay up for making the mistake of, uh, dishonoring you by taking you as a hostage. We'll apologize. We'll end the vendetta before it starts."

John scowled at him. "You jest, of course. How can you approach Robert, Sachem of the Hawks? You have admitted that you have no kin. You have no sachem to represent you. It is against the ban for such payment of bloodright to be arranged by other than the sachem of your clan."

The Skipper ran his palm over his forehead. "Mari, mother of Krishna!" he muttered. He looked at DeRudder. "Throw this dully out!"

John said levelly, "If you free me, I shall seek you out. I shall inform my clansmen of my dishonor and they will take their revengement. At the next Dail, I will announce my shame and the word will go out. And at the Dails of the other confederations the word will go out that the Hawks's bloodline has been shamed. And from one Dail to the other, the word will go out. Until nowhere on all Caledonia will you be safe from the revengement."

Harmon said urgently, "Look, this is completely empty. There must be some way to turn this off. So we're clanless men. O.K. In your towns you have clanless ones. Servants and so forth, evidently. What happens if one of them attacks a clansman? How is the whole thing settled?"

John turned his haughty stare to the youngest of the otherworldlings. "Why, all honorable men unite and kill the shameless clanless one."

Harmon winced. "I should've known better than to ask," he muttered bitterly.

For a long time, again, the six otherworldlings contemplated him.

DeRudder said, "That warder at the gate saw him go out with us."

No one said anything to that. The implication was obvious.

The Skipper's face was working in frustration. Finally, he snapped, "Gentlemen, we have just stopped being entrepreneurs and have be-

come explorers again." He looked at his first officer. "Mr. DeRudder, throw this barbarian out, then prepare the ship for space."

DeRudder looked at him. "We're leaving?"

"Can you think of an alternative?"

Harmon snarled. "It's one big nugget of platinum."

"That will be all, Mr. Harmon."

"Yes, sir."

"Come along," DeRudder growled at John of the Hawks."

John said, his lips white again, "You mean you are not going to honorably kill me?" He snatched his coup stick from his belt, and slashed the First Officer across the cheek. "I count coup!" he snapped, "Though, indeed, it is a worthless coup, since you are clanless."

DeRudder's face went livid. The gun came up.

"*Mr.* DeRudder, that will be all," the Skipper's voice bit out.

DeRudder conducted him down another corridor and finally to the compartment into which they had entered in the ground car. The first officer of the *Golden Hind* activated the sliding door, which opened in the hull. The ramp snaked out.

He handed John of the Hawks

in times to come

Next month features "Dragonrider," starting a two-part serial by Anne McCaffrey, concerning her world Pern and its human-dragon symbiotic culture—and the deadly menace of the Threads.

The problem's a very subtle one, really. Given that only specially talented individuals can establish the strange empathic link with the mighty dragons, a very real aristocracy system exists. Given that a deadly menace recurs at intervals of several generations: How can you keep people conscious of the necessity of the rules that must *be maintained if the race is to survive. Would you sacrifice today for a menace that was last reported in 1570? The Black Plague hit London more recently than that—and Congress wouldn't lay out $40,000,000 for a rat-control program!*

The Dragonriders had an insoluble problem—based on simple neglect!

THE EDITOR

his belt and scabbard, keeping the handgun trained on him, always.

John said flatly, "The Hawks will seek you out. The Clan Hawk of every confederation on all Caledonia will hear of the shame done their bloodline and will be watching for you."

"Shut up!" DeRudder snapped. "Shut up, or I'll burn you down right here. Then your Clan Hawk will have to figure out some way of crossing all space to get at me!"

John turned in dignity and walked down the ramp. He didn't turn to look until he was over the nearest hillock. He was moderately jittery about running into some of the Bruces that had been besieging the *Golden Hind,* armed as he was only with claidheammor and skean, and having no horse.

However, his nervousness was unnecessary. On the far side of the hill were Don of the Clarks and Dewey of the Hawks, along with a dozen more of the younger men of the Phylum. All were flat on their stomachs, on the crest of the hill, staring their amazement at the gigantic ship from space.

Don blurted, "We knew they had you, and were planning the rescue."

"What happened to the Bruces?"

"They made off when we approached. I believe they thought us the full power of Aberdeen."

John squatted down and watched also. "They return from whence they came," he said.

"Why did they take you?" Dewey of the Hawks demanded.

"They wanted more information about the ways of Caledonia, so that they could rob us," John said. He continued to watch the spaceship.

"And what did you tell them?"

John shrugged. "I cozened them. I told them a good deal of nonsense, to make them feel it impossible to remain on Caledonia."

Dewey said, "You mean you *lied*?"

John looked at him coldly. "They are not Hawks. It is not against the ban."

He turned his eyes back to the *Golden Hind*. The spaceship shivered, then slowly, with great dignity, rose into the air.

A sigh went through the ranks of the Aberdeen youths.

When it had reached an altitude of some two hundred feet, the great craft tilted slightly upward and began to progress straight ahead, and up. It gained speed in a geometric progression.

Don of the Clarks stood and, watching still, as were they all, with considerable awe, said, "They have gone."

John was looking off into the sky, at the disappearing dot, as well.

"But they will return," he said, with a wisdom beyond his years. "They, or others like them. For now we have been found and the old days are gone forever." ■

prostho plus

For an ordinary dentist in an ordinary town, the situation was not exactly comfortable. The patient's mouth had teeth—most remarkable teeth indeed. They were in bad shape, no doubt of that. And they were also most decidedly not human. . .

PIERS ANTHONY

Illustrated by Kelly Freas

Dr. Dillingham was forty-one years old: a conservative, successful, twentieth-century bachelor prosthodontist. His acquaintances thought him unimaginative; his patients thought he overcharged. He was, in short, a typical dentist with a secure future.

Sometimes the typical becomes atypical in a hurry.

Dillingham was not pleased to see Mrs. Nostrand so early in the morning. She was overweight, her arches were fallen, her veins varicose, her manner insufferable. She seemed to be afflicted with most of the maladies imagined by man, with a single remarkable exception: she had virtually perfect teeth.

He wondered why she had chosen to inflict herself upon him. Possibly it was because every other dentist in the area had already informed her that however common prosthetic restorations might be, they were dictated by the requirements of health, not fashion.

"Mrs. Nostrand," he began, knowing it was useless, "no ethical practitioner is going to replace a healthy tooth with a substitute. Our purpose is to restore the mouth, as far as possible, to its original state of health. You should be glad that you don't need such service."

"But all my friends have genuine gold inlays."

Dillingham controlled his temper. "I assure you, Mrs. Nostrand, they're not as good as nature's original dentin and enamel."

"Mrs. Jones paid four thousand dollars for hers," she said enviously.

He turned away to conceal his disgust. Had it come to this? A running competition to see whose mouth carried the most wealth . . .

"I'm sorry, Mrs. Nostrand," he said with finality. She stalked out, furious. He almost wished she *had* needed the work. It would have been easier to do it than to educate her.

Old Joe Krumpet, a regular client, was next. He was seventy and his teeth seemed to predate his body somewhat.

"'Nother blowout, Doc," he said cheerily. "Just put a patch on her and turn me loose."

Dillingham looked into his mouth. It was sheer carnage. He wondered how Joe could stray one bite from a liquid diet. There was hardly a disaster in the manual his teeth hadn't succumbed to over the years.

"Joe, that tooth will have to come out. There isn't enough of the original structure left to make it functional, and further deterioration could affect your . . ."

"Nope. None of that fancy stuff. Just plug her up so she don't hurt no more. She'll last as long as I do."

He had a point there. Dillingham repaired the damage as well as he could, not even attempting to lecture the patient on oral hygiene. Joe Krumpet brought in his teeth for repair much as he would his

vintage automobile. Could a mere dentist inject complexities into his simple world?

He finished with ten minutes to spare before the next patient and retreated to his laboratory for a break. It was going to be one of those days: college kids who stuffed their mouths with sugar and looked blank at the mention of a toothbrush; businessmen who "hadn't time" to undertake precautionary hygienic measures; women so afraid of pain that they screamed when he touched a healthy tooth with the mirror. All of them carelessly throwing away the priceless heritage of good teeth in their youth, heedless of the far more expensive and less comfortable substitutes necessitated in later life.

He was suddenly sick of it. Not of the work itself, but of the intolerable neglect he saw daily. So much of what he did would never be necessary if only people *listened* . . .

He rose and returned to the operatory, knowing that efficient Miss Galland would have the third patient properly prepared. At least he was spared the interminable details. Sure enough, there was a figure in the chair.

That was the onset of the atypical.

Dillingham put on a professional smile, washed his hands, and picked a bright metal scaler off the tray. This was a new patient, and—

He stared.

The face upon the headrest was alien. It was humanoid, but only vaguely so. A great flat forehead dropped down to widely spaced yet narrow eyes, and the nose was a triple slit. The mouth was closed, set off oddly by thin purple lips.

Before he could substitute a more appropriate expression for the frozen smile upon his own face, there was a noise. He looked up to see a second creature fiddling with the locking mechanism of the door. It must have been standing behind the door, waiting for him. The features were similar to those of the occupant of the chair, but at the moment all Dillingham noticed were the peculiar hands. They were gray, and the fingers appeared to be double-jointed.

Dillingham tried to think of a clever remark to dispose of the situation, but his mind remained infuriatingly blank. What conceivable explanation could there be for this, this . . .

"Gentlemen, there must be some mistake. I'm a dentist, not a plastic surgeon."

Neither creature seemed to hear him. The one at the door straightened up and faced him silently.

Obviously he was the victim of an elaborate hoax. Nothing on Earth resembled these creatures. Someone at the local college must have set up this masquerade, fitting grotesque masks of that realistic flexible variety over their normal fea-

tures. This was one of those disruptive pranks. An initiation. But how had they got past his receptionist?

"Boys, I have a busy schedule. Now that you've had your fun . . ."

The one in the chair opened his mouth.

Dillingham dropped the scaler on the floor. No mask could function as smoothly as this, yet the mouth was beyond credibility. The orifice was bone-dry and tongueless, and the teeth—

It was his business to know the normal and abnormal extremes of human oral anatomy. This far surpassed them—but it was without doubt a genuine functioning mouth, in a genuine functioning alien face. Since it was real, and no earthly jaw contained dentures like these—

He decided not to ask questions whose answers might well be beyond his comprehension. This was no joke, and this was no longer a conventional problem. For some reason two aliens—extraterrestrial aliens, for all he knew—had come to his office to demand some service. One sat expectantly in the chair.

The alien was not properly proportioned for the human recliner, but a few adjustments sufficed. Dillingham toyed with his instruments, wondering whether these creatures were dangerous. He couldn't afford to take a chance—

"Dr. Dillingham," a voice called from the hall. The standing alien jumped, and something appeared in one hand. These two hadn't made a sound so far, but they seemed to hear well enough.

"Dr. Dillingham!" the voice repeated more urgently, and the knob turned. It was Miss Galland. "Are you in there? The door seems to be locked . . ."

The guard lifted his hand. He held a small object resembling a glass prism. He pointed it toward the door.

Dillingham didn't wait to find out what the prism was for. "I'm busy at the moment," he shouted, putting enough irritation into his voice so that she would realize it was important. "Something has come up. Please reschedule my next appointment."

Her soft heels retreated, and the alien lowered the prism. Perhaps there had been no danger—but it did seem best to keep the girl out of it until he could be sure. The aliens certainly seemed to mean business.

Did they use speech at all? The single glance he had had into the oral cavity gave him serious doubt that articulation, as men knew it, was possible to them. Still, they had to communicate somehow . . .

Dillingham returned his attention to his patient. He seemed to be committed now, though, of course, he could not actually work on such a jaw. The mouth opened again and he surveyed it more thoroughly. It was a fascinating experience.

Four broad incisors lined the front section of the lower jaw, matched by five molars in the upper. This, at least, was what the teeth would have been called had they occupied a human mouth.

Biters opposed to grinders? Five to four?

What unearthly diet did this creature exist upon?

The overall problem of the alien presence became subordinate to the professional one. With dentition like this, how could he even guess at the normal state of the mouth? How would he detect the problem? And, granted correct diagnosis, would repair of any nature be possible? He knew nothing of the metabolism; he might kill the alien simply by applying a local anesthetic. The creature might bleed to death from a single scratch—if he had blood. Nothing could be taken for granted.

The standing alien seemed impassive, but remained meaningfully against the door, prism in hand. Suppose he were the captain of the alien vessel, while the patient was a valued officer, or crewman. At any rate, it was convenient to think of them as such, whatever the truth might be. Perhaps they had been on an exploratory cruise and had encountered difficulties which prevented an immediate return. Possibly their medical specialist had been incapacitated.

Whatever his reasons, the captain had seen fit to trust his man to the care of the nearest presumably competent specialist, rather than postpone the matter or handle it extemporaneously. The fact that the specialist happened to be of another world made no difference, or at least not enough to alter the situation appreciably.

There was food for thought here. Obviously the welfare of the individual, in the captain's society, was paramount, surmounting even the formidable barriers between separate alien cultures. The individual who would trust a creature he had never seen before—an Earth dentist—to handle so precise and intimate a matter as the repair of an oral breakdown . . .

That individual was either an absolute fool, or a person with enormous confidence in his control over the situation.

Dillingham glanced again at the captain. He did not have the appearance of a fool, and the prism glittered.

Yet the thing was impossible. The threat of a weapon could not create knowledge where none existed. It could not give a human being the power to operate on alien metabolism.

The captain moved, bringing up the prism. Dillingham immediately busied himself with the impossible.

The mouth was a paradox. There were no cuspids, no matched sets. Instead there were regular patterns of planed surfaces that could serve

no conceivable masticatory purpose. The white units were obviously teeth of some kind, and firm pink gum tissue clothed the base of each unit, but the manner of the teeth's application was a very tantalizing riddle.

Dillingham felt as though he were in a surrealist dream. Despite the intricacies of their derivation—teeth had first been formed from modified scales of the lip, countless millions of years ago on Earth—he knew them to be straightforward tools. They were required for any creature who cut, tore, crushed or ground its food, unless, birdlike, it specialized in some substitute. There was no point in having teeth at all unless they acted in one or more of these manners, and nature, ever the cynic, neither evolved nor maintained superfluous structures. This alien's teeth had to be functional, even if that function remained a mystery to the dentist.

How was he to define the problem? He saw no evidence of decay or abrasion. Every surface gleamed cleanly white. While he was hardly in a position to make an accurate diagnosis, all evidence he could muster indicated serviceable equipment.

He tapped an incisor experimentally. It was solid and well anchored. All the teeth were firm and without blemish. If there were a problem here, it was not a prosthodontic one. Why, then, had this patient come?

Dillingham put down his instruments and stood back. "I can't help you," he said, trying to ignore the prism and hoping his tone would convey the intended meaning.

The crewman closed his mouth, stood up, and went to the door. The captain handed over the prism and approached. Dillingham held his stance, uncertain what to expect.

The captain took his place in the chair and opened his mouth. Surely they hadn't gone to all this trouble for a routine checkup!

Dillingham shrugged, washed his hands and brought out a new set of instruments. There didn't seem to be much he could do except oblige their whim. These *were* aliens, and might react unfortunately to too obvious a rejection. He looked into the captain's mouth.

Suddenly it all came clear.

The crewman's mouth had been, as he had surmised, a healthy one. This mouth was not. The same atypical pairings were present, the same oddly-angled occlusals that could not possibly do more than dent the food irregularly—but several of the back teeth on the left side had sadly ravaged lingual surfaces.

The aliens had anticipated one of the difficulties, and had shown the dentist the healthy set first, for comparison. An admirable technique—but there was more to dentistry than comparison.

"Dr. Dillingham!"

The crewman whirled to aim the

prism at Miss Galland's voice. Had half an hour passed so rapidly? "Emergency," Dillingham called. "I'll be tied up all afternoon. Handle it as well as you can."

"Yes, Doctor," she replied, only the slightest trace of disapproval audible. He breathed a sigh of relief. Miss Galland was a competent dental assistant, but he tended to use her more and more as a receptionist because she made a much better impression on recalcitrant patients than he did. She really deserved to see the astonishing set of teeth—but he still did not dare expose her to the mercies of such questionable aliens. Meanwhile, he knew that the problems entailed by his unexplained cancellations would be tactfully handled.

He probed the first of the damaged teeth: the second bicuspid, for want of a properly descriptive term. The captain jumped; no doubt about its sensitivity. It looked as though some potent acid had eaten into the surfaces and stripped away the enamel and much of the softer dentin beneath—again thinking in human terms for the unhuman. It had been a recent accident; there was no sign of subsidiary decay. But the present condition was obviously uncomfortable and perhaps quite painful, and certainly constituted a hazard to health.

Dillingham observed, upon closer inspection, that the buccal surfaces had also been etched. Only an X ray, which of course he could not risk, could establish possible penetration of the pulp. This was a situation that could neither be ignored nor casually remedied.

It might be possible for him to repair the damage, or at least cover it with a protective cast temporarily—but only if he could properly anesthetize the jaw. Novocain was out of the question; he could not be certain it was either effective or safe. This was not a matter to be left to guesswork.

But the whole thing was ridiculous. "This is as far as I go," Dillingham said firmly. "It is better to leave you in pain than to destroy a life through my ignorance. I'm sorry." He stood back and crossed his arms.

When they saw that he was not going to proceed, the crewman leveled the prism at him. The captain stopped the action with a gesture. He stood up and recovered the instrument. He made sure he had Dillingham's attention, then aimed it at the wall and flicked a finger.

A spot like a cigarette burn appeared on the wall. A wisp of smoke curled up.

The captain made an adjustment and aimed again. This time a surface of the wall exploded, leaving a charred hole.

He returned it to the first setting and pointed it at Dillingham. The message was clear enough.

But what would their reaction be if the captain were poisoned by ignorant surgery? Dillingham shook

his head, sweating. Perhaps they were bluffing. It was certainly a better chance than the other.

"Dr. Dillingham!"

Oh, no! Miss Galland had come back.

The captain nodded to the crewman, who whirled to unlock the door. He had evidently thought of the same thing Dillingham had.

"Judy! Get away!"

"Doctor! What are you—"

Then the door was open and the crewman charged out. There was a scream.

Dillingham lunged at the captain, but the officer was not to be caught off guard. The beam from the prism stabbed out, burning savagely into his leg. Dillingham fell, clutching at his injured leg.

When the pain subsided, he looked up to find Miss Galland standing beside him, her black hair disarranged. The crewman had the prism again, and was covering them both.

"Dr. Dillingham! Are you hurt?"

It was just like her to overlook the incredible in favor of the commonplace. She was not the fainting type. He felt his leg.

"Just a burn," he said. "The thing was set on low." He stood up.

The captain resumed his seat. The crewman aimed the prism at the girl.

So much for resistance. The show would go on.

When the crewman saw that Dillingham had decided to cooperate after all, he put away the prism but remained before the door. At least the aliens had some sense of propriety.

"I don't think they mean any harm, Doctor," Miss Galland said, echoing his own thoughts. "They must be quite desperate." So much for hysterics; she had adapted to the situation far more readily than he.

Dillingham approached the patient. He had to still the shivering of his hand as he picked up a probe with a conscious effort. Aliens, shooting—this was not the ordinary fare of a dentist.

But the problem of anesthesia remained. Massive excavation would be required, and no patient could sit still for that without a deadened jaw. He studied the captain, perplexed.

The captain produced a small jar or greenish ointment. It seemed that this contingency also had been anticipated. Whatever these creatures were, they were not stupid.

Dillingham touched his finger to the substance. There was a slight prickly sensation, but nothing else. The captain gestured to his mouth.

Dillingham scooped out a fingerful and smeared it carefully along the gingival surfaces surrounding the affected teeth. The color darkened.

The captain closed his mouth. "How do they *chew*?" Miss Galland inquired, as though this were a rou-

tine operation. She had assumed the role of assistant naturally.

He shrugged. "The moment they take their eyes off you, slip away. We can't be sure of their motives."

She nodded as the captain reopened his mouth. "I think they're doing just what *we* would do, if we had trouble on some other world."

Dillingham refrained from inquiring just what type of material she read during her off hours. He probed the raw surface that had been so sensitive before. The patient did not react.

So far, so good. He felt professional envy for the simplicity of the alien anesthetic. Now that he was committed to the job, he would finish it as competently as he could. Dental ethics did not disappear simply because the situation was awkward.

It was a full-scale challenge. He would have to replace the missing and damaged portions of the teeth with onlays, duplicating in gold as precisely as he could the planes and angles witnessed in the healthy set. While it would have helped immensely to know the rationale of this strange configuration, it was not after all essential. How many centuries had human dentists operated by hit or miss, replacing gaps with wooden teeth and faithfully duplicating malocclusals and irregularities? The best he could hope for would be fifty percent efficiency —in whatever context it applied— yet if this protected the teeth and granted temporary comfort until the patient returned to his own world, it sufficed. He knew better than to expect perfection.

Would a gold alloy react unfavorably with the alien system? This was a necessary risk. Gold was the best medium he had to work with, and anything less would be both less efficient and more risky. A good cobalt chromium alloy would be cheaper—but for delicate work there was no substitute for gold.

He drilled and polished, adjusting to the strange internal convolutions, while Miss Galland kept the water spray and vacuum in play. He shaped the healthy base of each tooth into a curve that would offer the best foundation. He bored a deep hole into each for insertion of the stabilizing platinum-iridium pins. He made a hydrocolloid impression of the entire lower jaw, since the better part of the reconstruction had to take place in the laboratory.

Both aliens started when he did this, then relaxed uneasily. Evidently his prosthetic technique differed in this respect from that of their own world.

"Sorry," he said, as much to himself as to them. "Since I am not familiar with your methods, I am constrained to rely upon my own, peculiar as these may be. I cannot rebuild a tooth by approximation."

"That's telling them," Miss Galland agreed.

He needed the impression of both sides of the lower jaw because he had noted that it was bilaterally symmetrical. A mirror-image reproduction of the right side might reasonably do for the left. He ignored the upper jaw completely; since he knew nothing of the proper interaction of these surfaces, the opposing pattern could only confuse him. It could be unfortunate to allow anthropomorphic preconceptions to affect his estimate of such foreign structures.

But his curiosity about how those incredible teeth functioned was hard to suppress.

He extracted the hardened cast. He applied a temporary layer of amalgam, so that the jaw would not be sensitive when the anesthetic wore off. Then he had to explain to the aliens by means of pantomime that this was *not* the end product of his endeavors.

Miss Galland brought a plaster model of human dentures, and he pointed to the cutaway teeth and lifted out the mock reconstructions, then gestured toward the laboratory. After several repetitions the captain seemed to get the idea. Dillingham led the way, while captain, Miss Galland and alert crewman followed in that order. The major portion of the job was about to get under way.

Patients seldom saw the lab. Few of them realized the enormous and precise labors that went into the simplest inlay, onlay or crown, he thought. This time, at least, he would have an appreciative audience for his prosthodontic art.

Dillingham rinsed the impression immediately and immersed it in a two percent solution of potassium sulfate while Miss Galland helped set up the equipment. There wasn't much else she could do, because special skill was required for the early stages.

The captain watched the routine with what Dillingham was sure was amazement. Evidently the laboratory procedure was as strange to the visitors as their machinery would undoubtedly be to him. But what had they anticipated? Surely the dental techniques of North Nebula—or wherever they came from —had points of similarity. Physical laws should apply to both animate and inanimate procedures, whatever the language or the planet.

He filled the impression with a commercial stone preparation, vibrated out the bubbles, and inserted the dowels and loops for individual handling of the teeth. While the die set, he simulated the remaining steps for the captain: the intricate wax mockup of the onlay pattern for each tooth; the attachment of the sprue, so that the pattern and subsequent cast could be handled effectively; the investment, or formation of a durable impression around the wax pattern; burnout, to free the investment of wax and leave a clear mold for the liq-

uid metal; casting (he didn't even try to explain about the problems of expansion and contraction of gold and cast); and finally the pickling, finishing and polishing.

At last he manipulated the hands of the wall clock to show how many hours would be required for all this. He assumed that if the Nebulites had learned enough about Earth to locate a dentist when they needed one, they should also have mastered the local mechanisms of timekeeping. Evidently they had.

The captain was not happy. Had he thought that an onlay was the work of a few minutes? Probably, like most Earth patients, he hadn't thought about it at all. Everybody *knew* dentists spaced out the time between appointments merely to boost the exorbitant prices! Well, *this* patient would learn otherwise!

The captain produced what appeared to be a hard plastic rod and chewed it meditatively on his good side. Dillingham was afraid at first that it was another weapon, but decided it was not. Well, he thought, every species doubtless had its vices and mannerisms, and this was certainly neater than chewing tobacco.

The patient passed the rod to the crewman, who glanced at it with interest but did not choose to add any toothmarks of his own. No conversation passed between them that Dillingham was aware of, but abruptly the captain left. The crewman took a seat and kept the prism ready.

Evidently they did not intend to leave the captives to their own devices while the onlay was in preparation.

"They don't miss any bets," Miss Galland said ruefully.

Dillingham shrugged and bent to his work. It seemed the fastest way to get rid of the visitors was to complete the operation. He sawed his die into four separate segments, one for each damaged tooth, and plunged into the complex portion. The wax he applied had to be shaped into the exact pattern of the

THE ANALYTICAL LABORATORY / AUGUST 1967

PLACE	TITLE	AUTHOR	POINTS
1.	Starfog	*Poul Anderson*	1.78
2.	The Featherbedders	*Frank Herbert*	2.91
3.	Cows Can't Eat Grass	*Walt and Leigh Richmond*	3.20
4.	Depression or Bust	*Mack Reynolds*	3.27
5.	Babel II	*Christopher Anvil*	3.74

desired cast, for this, not the original tooth, was the real model. The die determined the juncture with the tooth in the living jaw, but the artistry lay in sculpting the upper surface of the wax into a serviceable duplicate of the original.

He set the cruder cast he had made in plaster of the good side of the captain's jaw before him and began the most difficult construction of his career. He had to make not an image, but a *mirror image,* and his reflexes were hardly geared to it. Each of the four patterns would take several hours.

Night fell as he completed the second pattern. A new alien came to replace the crewman, but there was no chance to escape. They chewed on rods, exchanged them, and parted.

"Dr. Dillingham," Miss Galland exclaimed. "That's how they talk! They make marks like that old wedge-writing."

It made sense. "Cuneiform," Dillingham agreed. So that was what the teeth were for! But the knowledge, while satisfying, didn't help them to escape. The new guard was as vigilant as the first.

Night passed. Miss Galland slept on the emergency cot while Dillingham kept working. They both knew that help was unlikely to come, because the aliens had come on Friday and nobody expected the office to be open on the weekend. Dillingham lived alone, and Miss Galland's roommate happened to be on vacation. Had the aliens also known this? Or were they just lucky?

Something else occurred to him. "Miss Galland!" She sat up sleepily. "Since these creatures don't use sound to talk with, they probably don't associate it with communication at all!"

"Have you stayed up all night, Doctor?" she inquired solicitously. "You must be pretty tired."

"Listen to me! We can plan our escape, and they won't even realize what we're doing. If I can distract the guard's attention—"

She came alive. "Now I follow you. But how can we get him to—"

"The thing to do is keep it quiet until after burnout, so he doesn't suspect anything. Then when I quench the castings—"

They worked it out while he poured thick gel around the wax and vibrated the cup. She slowly opened the windows, then set up a chair in front of one and sat down. One agile flip could catapult her into the back lot—if the guard were not watching. He *was* watching—but the one who followed him an hour later did not realize that the window was open.

The work continued. Dillingham finally poured melted gold into the inverted hollows of the final mold. The guard's attention was taken up by the sight of the hot metal, as though he were afraid Dillingham might try something.

"Now!" he cried, as he plunged

the hot cast into cold water. Steam puffed up, bringing the guard to his feet—and Miss Galland was gone.

Dillingham finished with a flourish. "How's *that* for a set of castings!" he cried. "And how's that for a slick escape," he added, as the guard turned to discover what had happened. "The police will be here in half an hour."

The alien had been tricked, but he was no fool. He wasted no time in a futile chase after the girl. Instead he pointed the prism at Dillingham, fired one warning beam that blasted the wall beside him, and gestured him toward the outside door.

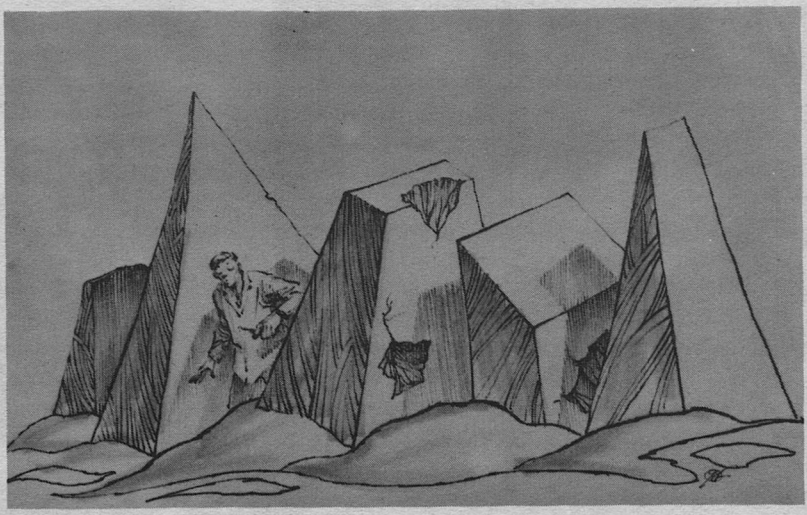
Two blocks away they came to an overgrown empty lot. Hidden within the thick brush was a shining metal cylinder, large enough to hold several men.

"Now wait a minute!" Dillingham exclaimed as a door swung open. But already he was coming to understand that the clever alien captain had anticipated this situation also, and had come prepared.

The cooling onlays burned his hand. Perhaps the aliens had never intended to let the Earth-dentist go. If they needed help once, why not again, during the long voyage in space? He had demonstrated his proficiency, and by his trick to free Miss Galland he had forfeited any mercy they might have contemplated. The captain meant to have his restorations, and the job would be finished even if it had to be done en route to—

To where? The North Nebula?

Dr. Dillingham, Earth's first spacefaring prosthodontist, was about to find out. ■



THE CASE OF THE

perjured planet

The real advantage of an education shows up when the guy you're working against doesn't have one and you do. Like the librarian, with his Bookworm Computer for memory—and a highly advanced education in Whodunits Down The Ages!

MARTIN LORAN

Illustrated by Kelly Freas

I

Flourishing the quill pen, Quist put a period to the last sentence which was more in the nature of an inkblot, and glanced back over the page he had written, an expression of immense satisfaction on his face.

He finished rereading and looked towards the console speaker on the wall that was the mouth of the computer.

"What do you think of this, Bookworm?" He began to read from the manuscript in his hand. On the cover in neat lettering was the title: "Say It With Bullets."

"It was a good day for getting wet. As good as any other day, like the one before when I had got just as wet and for just as good a reason. Rain was falling in a straight line down out of black clouds that hovered over the brown and damp-stained tenements. The fire escapes were like rusted bits of iron pasted onto the rotting boards by a sculptor who knew his stuff was junk. I was glad there wasn't any wind. If there had been a wind I wouldn't have got any wetter, but I would have enjoyed it less.

"I had been standing in the rain for two days watching the doorway across the street waiting for a car —not any car. A black sedan with white sidewalls and a three hundred horsepower engine hidden under a hood that made it look like any other black sedan of the same year and model. The engine wasn't the only thing different about it. The other thing was the body in the trunk. Rusty O'Toole had fingered the car . . ."

"Fingered the car?"

Quist looked up. "Yes," he said, a shade of irritation in his voice. "What's wrong with that?"

Bookworm considered for a moment, with only the faint humming of the computer audible in the vast inner room of the ship. Quist imagined it to be an amused and superior hum, but he knew it was only his irritation that made it seem so. When Bookworm was amused, he chuckled, and anyway, he never seemed amused by anything Quist wrote.

"The term 'fingered' dates from the early twentieth century and refers specifically to the informing by one person upon another person in regard to some illegal act the latter may have performed. The term would not have been used to refer to some inanimate object such as a car. If you wish to use the proper idiom of the time, 'given me a lead on' would be the correct phrase."

Quist let the paper drop from the fingers of his left hand. It lay accusingly on the table. "All right," he said bitterly, *"You* write it then." He realized immediately that he had made a mistake, but by that time the machine had already begun to hum over the problem which he had unwittingly fed into it. After a few seconds it stopped humming.

"I can let you have it in about an

hour," it said. "The title will be 'Die Delilah, Die.' As to length . . ."

"No!" Quist said.

"You don't like the title?"

"I don't like the idea. Detective stories are *my* hobby, Bookworm. 'Say It With Bullets' is the only thing that's kept me sane on this trip. You stick to your surveys and let me do the writing."

The machine stopped humming, but in its usual mumble of noise Quist could detect a note that was not normal. He wondered if the machine was about to go wrong again, but discarded the idea. The interference mechanism had programmed a triple bank-overload blowout just the previous day and it wasn't likely that another failure would occur so soon. The men who made up the tapes on the interference mechanisms had, on the whole, a fair understanding of the problems of being a librarian. This left only one likely reason for the Bookworm's reaction. It was jealous.

Cybernetically, the idea was ridiculous, but Quist had been on the Library circuit for more than twenty years. In that time he had gained a healthy respect for the activities of Fate. Given enough time and enough planets anything could happen. He glanced almost nervously at the huge machine that occupied one wall of his ship's only cabin. There was a lot of knowledge in those memory banks, the accumulated wisdom of a million writers, human and nonhuman. Nobody could be very sure what went on inside the brain of a Bookworm, except perhaps another Bookworm—and he knew the nearest was more than five light-years away, over near Paradigm, where Tom Corbett was trying to sort out the problems of five planets that had somehow managed to reorientate their culture to dispense with written language.

Quist got up and drifted down the cabin to his bunk. He felt odd. It took a few moments for him to sort out his emotions, then to put a name to them. Eventually it all added up—his irritation with Bookworm, the idea, crazy now, that the machine might be jealous. Quist recognized the signs—he was bored.

It happened occasionally. Not very often of course—most of the time he was too busy to think, let alone be bored. Librarian Service men were not, by the nature of their work, very often allowed to sit around and look at themselves. But this trip had been different. The planets so far visited on this swing had been dull. One landed, gave out the usual stack of new technical material and a few interesting novels, attended a dinner or two, dutifully looked at the new power station and then gratefully spaced out. He almost envied Tom Corbett his problems on Paradigm. Even a tricky job like that would be better than this milk run.

Bookworm bonged quietly and a

few lights flashed on the face of the machine like first stars.

"Napoleon 6 in twenty-four hours, Quist. Do you want a report?"

Quist drifted back to his desk and sat down.

"Better let me have a look at it," he said. "Another whistle stop, I suppose."

There was no response from the Bookworm, though Quist thought he detected a point in its silence. He was well on the way back to his jealousy theory when the press stopped whining and a newly printed and bound copy of the survey report on Napoleon 6 slid out of the chute onto his desk. In the depths of the machine a flake of film slipped back into its slot among the millions of other flakes, and the reproducing camera grew quiet. Quist sighed back his depression and opened the book.

Half an hour later, he had successfully crossed the ocean of general remarks about the flora, fauna and strata of Napoleon 6, only to be cast up on a reef of statistics that filled the last third of the volume. He knew a little more about the place, but not much, and what he knew was not very promising. It would, he knew, be another dreary visit. Napoleon 6 was a dead-end world.

It had not always been that. Once, according to the details, it had been quite a place. Volcanic, severe Draysonianism in its orbit, a variety of animal life wide enough to make settling there a job for men with little respect for their health. Thirty years ago it must have been a regular monster of a world. But that hadn't lasted. Softening up tough planets was like winning a fixed fight for colonists trained in terra-forming. Well, he might get away from the place inside a week, and there was always a chance that the next one would be better. Meanwhile, he could get on with the detective story. In the world of private eyes and beautiful blondes he felt more at home. At least there people *did* things.

The statistics in the back of the book were largely meaningless to him but he ploughed on doggedly. Vegetation, atmospheric density, geology . . . he read a bit further, stopped, turned back, read again, then stared at the wall for a long time. He checked the index, then reread the charts for the third time, slowly and carefully. Something seemed very odd in the table of minerals found in the survey on Napoleon 6. Nothing important—just a little variation. He made a note to ask somebody about it when he got there, tucked a reminder in the back of his mind, and once again let his thoughts wander into creative channels. Too much of his time was spent with problems that required cold, hard deduction. He liked letting his imagination have a run. If only Bookworm weren't so critical.

Quist picked up his pen and began writing.

I saw the car coming slowly down the street, ploughing its way through sullen rain that danced on the ground like a troupe of tired stripteasers to the noise of a two-bit, two-piece orchestra. The piano was the slap of rain on black metal, the saxophone the muffled roar of the big engine. Then I wasn't watching the car any longer. I wasn't watching anything. I was falling off the balcony into the orchestra pit, which was very dark and a long way below, and the only music was the ringing in my ears.

It wouldn't be a bad book, Quist decided. He had the style down all right. Maybe the Central Library Board would even give him permission to publish it. Although, now that he thought about it, they probably wouldn't.

"Quist," Bookworm interrupted, "I've finished the first chapter of 'Die Delilah, Die.' What do you think of this . . .?"

II

It was a new city, polished and smooth, slim and modern. There was nothing man-made on the planet older than thirty years, if you didn't count the people who had come then, in their twenties.

Quist strolled through the streets, avoiding even the pedestrian express belts that linked the major sections of the city.

The buildings were white and gray and rose and light brown, all sand colors, soft colors, still colors. No reds, or blacks, or purples; nothing to startle. A clean, antiseptic, beautiful city, which Quist found pleasant but not exciting.

He heard the noise, shouting and cheering and horns blaring, before he saw the parade. Turning a corner, as if the music were a scent he was following, he came upon the crowd lining both sides of the streets. The marchers, dressed in rough brown planet-fall suits, farmers' overalls, and technicians' smocks, carried banners and flags. The band was large and noisy and Quist recognized the national anthem. Like all national anthems it was less than indifferent music, painful to the ears of anyone who had no emotional associations with it.

Quist glanced at the flat silver band on his wrist. He had two hours before his meeting with the President. Time, he decided, to watch a parade.

After fifteen minutes standing in the crowd, he decided that parades were much the same anywhere, anytime. If there was anything special about this one, it was the lack of excitement among the crowd. They cheered, but without energy.

Quist watched for a while, wondering why the spectacle seemed so flat and lifeless. It wasn't just the monotony of the floats, the dreary sameness of the faces that marched

raggedly by, or the pointless om-pa-pa of the band—these were common to all parades. There was something else here, an element that grated on his mind, even worried him.

The man next to him was tall, brawny, a laborer with hands the size of metal grabs and a face like a retread. Quist glanced at him, then at the parade.

"Pretty poor, eh?"

The man turned his head slowly and looked down at Quist's head, easily six inches below him.

"*We* like it," he observed amiably.

"I don't see why. A pathetic exhibition, I say. I've seen better in a Boy Scout's camp on Earth."

"We do things differently here," he said. "This suits us."

He turned back to the parade. A group of farmers was struggling by in rough march formation, spades at the ready. They looked embarrassed. Quist applied a little more pressure.

"Aren't there any men on this planet? I never saw such a weak-kneed lot. Soldiers with shovels!"

A few people turned to look at him, but they spared him only a glance before turning their eyes once again to the parade. The ham-fisted one didn't even respond this time. Realizing he would get nowhere, Quist pushed through the crowd and back to the quietness of the side streets.

His theory had more support to it now, but some other details remained to be filled in. He moved quickly through the wide avenues that led off the main streets of the city, ignoring the smooth, clean, pastel facades of the new buildings, the unbroken areas of plasti-glass gleaming in the sun. The face of a city fearfully hiding something behind its bland appearance. Happily, Quist assured himself that it shouldn't be difficult to lift the mask.

It didn't take long. Five minutes from the center of the city, the mask began to slip. Streets, up to now wide and clean, became suddenly narrower, closing up in front of him into lanes along which dark and crooked buildings leaned their heads together and spoke in shadows. The sidewalk became concrete instead of plastic composition, and jutting edges tripped him. There were fewer people around, and they were different from those he had seen so far. They looked worried, happy, abstracted—and above all, busy. Like, in fact, any crowd on any Earth city street. This was the sort of city he felt comfortable in.

Signs of the old Napoleon became obvious almost immediately. On a wall he found the tattered fading remains of a poster, dating from the bad old days. It was largely obliterated by later signs, but Quist recognized the familiar pattern. There was the face of Marcus Obolensky, ravaged, fissured like old marble, a stern unsmiling mask. The message

was simple, in plain black type: The Old Man Says BUILD.

Quist looked at the poster and began to understand better what had made Napoleon 6 a habitable planet. The Old Man Says BUILD. It was good press relations, worked out perhaps by a man without training, based on an instinctive understanding of human nature, but good press relations all the same. The figurehead, paternal, demanding, stern but compassionate. If you failed, you had to face the anger of those cold gray eyes. If you succeeded, you might feel that rough hand laid on your shoulder, perhaps even a word of commendation, from the man who, almost single-handedly, had built this world. If the old man said "Build," you built.

Further down the road, past the poster, Quist saw a break in the line of buildings, and there the city proper dwindled into suburbs, running out onto the black basalt plain that made up most of the continent. He headed for the place, noticing that people were fewer here and that there was a new smell in the air, acrid, pungent—the smell of burning.

Wooden trestles barred the road, but they were old and weathered. He pushed them aside and walked to the end of the roadway. At the end he stopped, and looked down into the mouth of doom.

Like a ragged grin, the fissure curved around on either side of him, the exposed edges of the rock like those of an unhealed scar, sharp and crusted. It was a hundred yards wide, perhaps more. At the bottom, what looked like a mile below, Quist sensed a dark rolling, the slow movement of oily smoke. The smell he had noticed on the streets welled up in the hot still air, staining it with yellow fumes. Quist stepped back, but kept looking.

The fissure was interesting, but other things about it were more interesting still. Now that the initial shock was over, he noticed that the crack was more than just the memento of a giant earthquake. About fifty feet down the side of the opposite cliff, he saw a buttress jutting from the rock. It leaped out over the abyss, presumably connecting up with his side of the crack. Moving closer to the edge, he saw another buttress, and then more, a string of them regularly spaced all along the cliff. Quist recognized their use, though he had to look to find a name. They were sutures, stitches of iron and concrete strong enough to hold a world together.

Treading the no-man's-land between the last of the buildings and the lip of the crack, Quist examined the place at length, trying to fit it into his picture of Napoleon 6. It had taken tens of thousands of man-hours to make those buttresses, and possibly a few hundred brave men lay down at the bottom among the fumes and the perpetual dark. It was a task that nobody would have suggested could have been done

but they had done it. Yet the laborer in the crowd watching the parade had had the drive and pride of a jellyfish. Did this sort of spirit die in thirty years, the spirit that refused to recognize the world-cracking rights of an earthquake, and proceeded to stitch its crust back together again?

Then there was that business of the magellanium. He had mentioned the matter to the government liaison officer who had come to meet him at the ship, mainly out of curiosity. There was probably a good and simple explanation of why it had not been listed in the table of elements found in the geological survey of Napoleon 6. Quist had just not been able to think of it. The liaison man had seemed surprised, even frightened by his query. Most of the things that bothered Quist about Napoleon 6 were not facts. You had to be a librarian to see them—and it helped to be a librarian who liked detective stories.

The buildings past which Quist was walking had become more rickety now. This was old deserted land, studded with abandoned houses still showing the marks of earthquake and fire. He wondered where he had seen this sort of place before, then remembered with a smile. Old warehouses, abandoned vacant allotments—it was all copybook private-eye country. Here Sam Spade and Phillip Marlowe had hunted their quarries like relentless nemeses. Here they found the bodies of beautiful women strangled by their own stockings, or ratty informers ready to die, but only after they had choked out the last enigmatic clue.

Quist glanced over his shoulder, then wondered why. Perhaps he was starting to believe his own plots, but there was a definite feeling in the air that . . . what? That he was being watched? It was ridiculous. Next thing he would be imagining other, sillier things, like the possibility that someone would take a shot at him. He breathed into laugh, but the laugh never came. Instead, there was a sharp brittle sound that echoed down the gray and narrow street, and a shock that threw him to the ground.

Quist looked down incredulously at the blood staining the now tattered sleeve of his coat. Before he fainted, his mind had time to be grateful that the marksman had read detective stories, too. The first shot was always a warning.

III

The pain came almost immediately, and Quist knew then that it wasn't a bad wound. Squinting warily from behind a low wall where he had wriggled for cover, he struggled out of his coat and examined the jagged gash in his arm.

He had been lucky. The bullet —a lead slug, he guessed; nothing so sophisticated as an impulse shell

—had ripped through the upper part of his sleeve without touching him. But then it had gouged a long furrow in his forearm. It was bleeding freely and his whole arm was beginning to throb.

In the books, Quist remembered, the detectives always tore up their shirt, stuffed a wad of cloth across the wound and waded in to clean up the criminals. Struggling to remain conscious, Quist realized that the old private eyes were somewhat tougher than he was. The combination of shock and pain made him dizzy and ill. He leaned weakly against the wall and watched the blood seep down to soak his coat. The world began to black out.

Then somebody was bending over him, fingers were pulling at his coat, turning him over. He struggled, but the hands that held him were too strong. Through the haze he felt the prick of a needle and something acrid puffed under his nose. The dizziness began to fade and a face swam out of the mist—bearded, solemn, but not menacing.

"Who . . .?"

The man did something to Quist's arm, closed a case on the ground beside him and slipped it into his coat.

"Addison," he said shortly. "How do you feel?"

"Rotten." Quist tried to sit up, but failed. Still, he felt better—the pain was fading.

Addison stood up. He was tall, angular, with the abstracted motion of a tall water bird. Quist noted his clothes and tentatively categorized him as sedentary, perhaps academic, almost forty . . .

"You'll be all right now," he said shortly. "I'll be seeing you."

He was a few yards away before Quist realized he was going.

"Hey! Come back . . ."

But he was gone among the ruins.

Quist looked at his arm where a white plastic cocoon covered the wound. His bloodstream tingled with antishock, antiseptic and a stimulant. Addison had done a particularly neat job of patching up the man he had shot. Or had he shot him? Quist doubted it, though there seemed no other explanation.

He sat leaning against the wall, trying to make some sense of it. Then he looked at his watch, quickly rose and made for the city. Even a bullet wound was no excuse to keep the President waiting.

When he was young, Marcus Obolensky had been handsome. He had never really forgiven the world for that.

The early years had been good, but he had been too young to appreciate his luck. By the time he knew he was handsome, his looks had begun to slip away, each new diminution adding a further layer of hatred to his armor against the world. At fifty-three, he had been ugly inside and out, callous, brutal,

hated by everyone who knew him. When the Colonization Crews ran up against the roaring volcanic giant of Napoleon 6 with its ungovernable earthquakes and wild Draysonian orbit, a dozen men had suggested him for Planetary Controller. There had been no arguments at the meeting, not even from Obolensky. He had expected something like this. It fitted in with what he thought of the world.

Then, just to be difficult, Obolensky decided to tame the planet. The idea began out of contrariness, then developed into an obsession that drove him to the edges of endurance and beyond for fifteen years. One by one, his body's vital functions collapsed, only to be revived again by drugs or artificial organs. He died five times in seven years, and by the end of the eighth he had no more fear of death than has a tree. Faced with a leader so impossible of categorization, the people of Napoleon 6, doubtful of their ability to overthrow him or to cause his death, fell back on their oldest standby and adored him. Overnight, he became The Old Man, Father, Ogre, God.

The god sat at his desk and read slowly through the report his secretary had given him. There was much in it of interest and he read carefully. The stained-glass window behind him threw bands of colored light across the paper, the pattern of red and white it made echoing his own feelings, calculation and anger crossing and recrossing in his mind.

At the end of the report, he folded the paper carefully, then refolded it again and again. The document aid on his desk took it delicately between its metal teeth and nibbled it into a pile of dust which flared into ashes an instant later. Obolensky did not blink at the light of the fire. He was thinking.

"Is he still outside?" his voice was like the grate of metal on rock.

The secretary nodded.

"Send him in. And then get Klava."

"General Klava is in . . ."

Obolensky looked up. For an instant the young man saw deep into the eyes that reflected Marcus Obolensky's mind. He said nothing more.

At the door, he motioned to Quist and went back to his office. Quist watched him go, wondering at the pale face and the look of dreadful fear in the young man's eyes. Then he turned and walked into the Presence.

Obolensky looked up.

"Mr. Stephen Quist. Librarian—that's officially. Unofficially, Ambassador Extraordinary for the Galactic Assembly, Special Envoy and all-round planetary troubleshooter. Officially a bookman. Unofficially, a social engineer." Obolensky spoke his sentences precisely, his tone as efficient and cold as the eyes that bored into Quist like

a diamond drill. Quist stood at ease, calmly returning the gaze. "I have met only one other librarian. That was three years after planet-fall. He had his own ideas regarding the development of Napoleon Society. However, they didn't square with mine. What's on your mind Mr. Quist?"

Quist considered for a moment. "Officially? Well, I'm here to deliver some books. That'll take a few days of course. Consultations with your Library administrations; computer survey of your complete stock of subjects and titles. Then printing of the books required in sufficient numbers. A few days is all I'll require."

"I'll arrange the appointments you need and you will be advised. Everyone concerned will extend full cooperation. We need new books, particularly technical books."

"Perhaps a few books on mining and engineering?"

Obolensky's gaze did not waver. His lips remained in a firm line slashed across his ragged face. He did not answer immediately. "Yes, Mr. Quist," he said. "Yes, those—and others."

Quist nodded and allowed himself a faint smile.

"I hope you will be pleased with my selection," he said.

"Do you think I might not be?"

"No reason to think that, sir. Although, of course, a librarian's job is not to please."

Obolensky let the remarks sink in, but made no response.

"Was there anything else, Mr. Quist?" he said eventually.

The librarian studied the man thoughtfully. His appearance was deceiving. He looked old, the thin body and the veined hands giving a faint impression of vulnerability, as if the cold strength of the man were only a shell which could be easily shattered. Quist thought, he knew, such an idea was foolish. There was no weakness in him.

"Yes, there is one thing. I noticed something odd about the table of elements listed on your latest geological survey—the one, I believe, that was prepared in response to the Galactic Assembly's mineralogical survey request. Perhaps you could tell me why there was no magellanium reported on the list."

The silence was as cold and still as the white light from the window.

"Why should there have been."

"Are you familiar with the survey?"

"I've read it."

"And?"

"It seemed quite in order."

Quist shrugged his shoulders. "There are parts of it I don't understand."

"Mr. Quist, are you a geologist?"

"No."

"You aren't an expert in this field?"

"Of course not."

"Well, you have full authority to

consult the experts, including the geologist in charge of planetary survey. In other words, the Assembly representative on Napoleon. All reports, findings and records are also at your disposal. Would there be anything else, Mr. Quist?"

"No, sir. Thank you for your time."

"It has been a pleasure meeting you, Mr. Quist. I hope your mission on Napoleon will prove rewarding."

"I'm sure it will. My job is always rewarding. I never get tired of delivering books. Good day, sir." Quist smiled at the old man and bowed slightly.

Obolensky nodded a reply and Quist turned and walked to the door. He paused as he was about to pull the door shut behind him. The old man's eyes were still on him, like two cold points of light. "The Library Service doesn't just supply technical and scientific books, of course. Our purpose is to provide a complete balance of cultural material, including fiction." He paused. "Have you ever read any detective stories?"

"No."

"I'll include some in my selection, sir. They can be *most* rewarding." Quist closed the door behind him.

Walking down the hall, he glanced back and saw the nervous young man peering out of his office. When he got outside the building, Quist thought about what he should do next.

In the end it was an easy decision. The first thing he had to do was get an office.

IV

"An office?" The caretaker's face went through a variety of expressions ranging from greed to fear, and settled finally on something approximating doubtful interest. "I think we might have a spare suite, but I'll have to check." He smiled thinly and went into his little cubicle.

The door closed, and a moment later Quist heard the sound of a teleview being keyed. Politely moving out of earshot, he looked around.

Office buildings were much the same no matter where one went in the galaxy. Architects might scheme, developers curse, decorators weep, but an office building was nothing but an overblown beehive, and there was nothing one could do about it. Not that the architects of Napoleon 6 had tried too hard. The mortality rate on buildings was such that construction for show was worse than worthless. Buildings were made thick and quick, in that order. Piers riveted them to the rock, metal frames held them rigid. The rest was pure show and not many architects even made the effort to inject a little aesthetic quality into their work. Concrete was the main material, raw and uncovered, still

marked with the lines of the frame work. The floors were rubberoid, the light fittings imbedded in the wall and covered with thick glass eyelids. Everything sweated, even the air was clammy. Quist had never seen anything so sleazy. It was just what he wanted.

The caretaker came out of his office and closed the door. Quist had no doubt that his call had been to Obolensky's office and that somebody there—that pale young secretary perhaps—had supplied him with a line to hand this inquisitive Earthman. He felt a little sorry for the young man. He was in for a busy week.

"We do have one suite, on the fifth floor. Two rooms. Quite a nice view."

"I'll have a look at it."

They went up in a lift that looked like a diving bell. Quist looked at the sweating metal and made a note to wear thick socks and sweaters when he moved in. His "suite" was almost as bare as the corridors. Quist looked out of the narrow window at the view, a sorry panorama of wet gray rooftops. He smiled, and gazed back at the room. A desk, two chairs, a filing cabinet, some curtains. Perfect. He looked around, wondering what was missing. Of course. "I need a carpet. Something old, threadbare, a bit dusty."

The caretaker looked at him oddly, opened his mouth to make some remark, then stopped, apparently remembering his orders. It wasn't his business. The Old Man had said "Humor him." So . . .

"I'll arrange it," he said. "When do you want to move in?"

"Right away."

"Right away? But . . ." There was a pause. "Very well." The caretaker left.

Quist stood at the window and looked out on the city. Not an especially good city, but not an evil one either. Just ordinarily sick, ordinarily happy. There ought to be plenty of people there who needed a private eye.

He sat down at his desk and swung the seat experimentally. It squeaked as it should. The drawers of his desk were empty, except for some dried-up fruit skins in the bottom one. He took them delicately out and dropped them over the window ledge. Only one thing belonged in the bottom drawer of his desk—a bottle of bonded bourbon. He stared up at the gray ceiling of his office and wondered what bourbon tasted like.

After half an hour, he looked at his watch, then took a notebook from his pocket. It was still sharp-edged and a little damp from Bookworm's press. He opened the first page and ran his finger down the rows of figures and symbols that covered it. His mind, trained for years in instant calculations of considerable complexity, began to turn over the numbers, digesting them,

determining the pattern. After a moment he made a note on his pad, completed a series of quadratic equations and scribbled down a single figure. Then he glanced at his watch.

The sound as he crumpled the piece of paper and threw it into the wastebasket was the only one in the hushed office. The screwed-up paper unfolded a little, like the scrabbling of an insect against the metal sides of the bin. Then there was silence. Quist waited.

There was a knock at the door. Quist didn't move. It opened, and small nervous footsteps came across the floor of the anteroom. The inner door opened slowly. Only then did Quist open his eyes and look up. His math then was not too rusty. His first client was right on time.

A little man came through the door like a rat out of his hole. First, a thin sly face extended itself on a skinny neck a few inches into the room and a pair of weak gray eyes peered nervously around. Quist received only a cursory glance, no more than the man gave to the desk or the dusty curtains.

Satisfied that nothing immediately threatening lurked in the office, he sidled through the door and smiled at Quist, a thin sly smile like his face. He carried a rolled umbrella and wore faded leather gloves that he drew off awkwardly like a young girl taking off her stockings.

"You're the librarian, Mr. Quist?" The little man kept his eyes averted and twisted his gloves convulsively.

"Yes."

The eyes continued to dart around the room, as if following a vagrant fly. "The teleview advertisement said you were offering your services as a detective."

"Yes, that's right, Mr. . . ."

He ignored the inquiry. "I don't exactly need your services, Mr. Quist, but I think I may have something I can offer you."

Quist said nothing, waiting for him to go on. The man continued the flicking dance with his eyes, waiting for Quist to say something.

"All right," he said, "what is it you want to offer me?"

"First, I want to be sure you're interested. You see, there is a certain amount of risk in my coming here. I don't wish to pursue the matter further if we can't come to a suitable arrangement."

"How can we come to any arrangement until I know what you are offering and what you want?"

"Well put, Mr. Quist. Exactly. And how can we come to an agreement unless I know what *you* want?"

"Let's stop fencing with each other, shall we? Tell me what's on your mind. What are you selling?"

"I don't know much about librarians, Mr. Quist, but it's quite obvious that distributing books isn't

your only job, otherwise you wouldn't be in this office. You're investigating us—this planet. *Why?"*

"I think you know the answer."

"I have an idea as to the answer, that's all."

"And you want to sell me your idea?"

"Something more concrete than that. I have a package. At the moment it's in a traveler's storage locker. I want to sell you the contents of that package."

"Why do you think I would be interested?"

"Because it's my idea that what's in that package is the key to what you're looking for."

"And the price?"

"First of all, safe conduct off Napoleon. This is big, Mr. Quist. I, myself, am not sure of all that's involved, but I've had plenty of time to think out the angles. You see, I made my . . . well, my discovery almost a year ago. I had no intention of doing anything with it until you arrived. Then I realized that you, as a free agent of the Universal Assembly would no doubt be interested in my secret. When you ran that advertisement, I knew you must have suspicions of some kind about the veracity of the Napoleon government. Perhaps I'm wrong, of course. Perhaps what you're looking for has nothing to do with my little package, but I think you'll be interested just the same."

"You were telling me the price."

The little man moved around from side to side in his chair and smiled faintly with one side of his mouth. "A hundred thousand credits—and as I said, safe conduct from Napoleon."

Quist nodded. He still had not met his gaze, but Quist studied the thin crooked face, its oily condition an indication of how rarely it was washed. A hundred thousand credits was nothing to Quist or the federation. He could give that away with no more than a single line justification in his expense book. The question was whether he really believed the man had something—in which case the money was fair exchange—or whether he was simply a con man, in which case Quist would be wasting his time. He thought for a further ten seconds and then made his decision.

"All right, I agree. Where's the package?"

The little man's manner became even more nervous and apprehensive than before. He actually turned around in his seat to look behind him. There was nothing there.

"I'll have to bring it to you. Not here. It's best we meet in a public place, I think. Then, when you've examined the parcel, I can accompany you to your ship. You'll have to take me to your ship, Mr. Quist. It's the only safe place."

"I'll guarantee your safety."

"Thank you. Thank you. Look, I'll meet you at the Natural His-

tory Museum. That's at the central plaza. I'll meet you in the geological section, in the gallery. In three hours. Don't be late, Mr. Quist."

Quist smiled. "Don't lose the package."

The man didn't respond at all to the joke. He stood and turned to the door. "I must go now. Three hours, Mr. Quist."

When the little man had gone, Quist took the book out of his top drawer. He flipped a couple of pages and made a few notations on a piece of paper. Things were going on schedule in a way which might have been satisfying if it had not been quite so dull. Still, it didn't do to hurry the scheme of things. If Bookworm said that these were the equations—and he had been quite insistent, in his overbearing, authoritarian way that they were, though more than a little annoyed by what he called Quist's "crackbrained" scheme—then that was good enough for him. If a librarian couldn't trust his Bookworm, then who could he trust? Except perhaps his own intuition.

Quist swung his chair and looked out through the grimy curtains. That was the final problem, when you got right down to it. You could do a reasonably good job of keeping the universe going just by relying on computers like Bookworm. You might even make some improvements if you were lucky. But time after time he found that while he was feeding the data into the computers and correlating the answers, some man somewhere had gone ahead and solved the problem with a hairpin and a bit of string. Quist was a realist. He knew, as well as anyone, the fallacies of the humanist arguments. But he had been around the universe long enough to have a healthy respect for the ability of man somehow, often without knowing why, to come up with the right answers to his problems. The belief had got him into a dingy office on Napoleon 6, waiting for somebody to knock on the door.

Somebody knocked on the door. It sounded like the knock of a beautiful blonde, about five feet four, with a full figure, a seductive smile, and a twinkle in her eye.

Quist swung his chair back to the desk and called out "Come in."

She was blond, about five feet four, with a full figure, a seductive smile and a twinkle in her eye. Her figure, Quist noted, was mathematically proportioned to a degree that would make Bookworm's description "not spectacular" technically correct. Then he glanced at her face and brightened a little. Even the Bookworm could be wrong sometimes. Her eyes were gray, not blue.

She sat down in the chair opposite him and looked at him levelly across the desk.

"Are you the man who advertised on the video?"

"A lot of people advertise on the video. I offered to find lost people, get you out of trouble if you were in it, without getting into jail if possible. If that's what you want, I can probably help you."

She smiled. It was a good smile, a little prim but not without warmth. A smile you could get to like, in time.

"Probably?"

"I can't work miracles, I'm only human."

"You're from Earth."

"Earthmen are just as human as anybody else. More, if anything."

She leaned forward a little. The skin of her throat was clear and pale, and a little blue vein pulsed quietly somewhere under the first few layers.

"I don't believe it," she said, smiling again.

"I don't care if you believe it or not. I'm a man trying to do a job. Is that so hard to believe?"

She stood up slowly and walked around the desk to the window. If she had meant the action to give Quist a better idea of what vast areas were covered by the definition "not spectacular," then she succeeded. He watched her until she disappeared out of the corner of his vision, but stopped himself with an effort from turning. She remained standing behind him at the window. He looked at the wall and tried not to think of things hitting him at the base of the skull.

"It's not hard to believe you're doing a job," she said. "It's the kind of job you're doing that interests me."

Something touched him at the base of the skull, but it wasn't a blackjack. Her fingers stroked the hair on the nape of his neck and Quist forced himself not to shiver. Jerking his head forward, he swung the chair hard, so that she had to step back quickly to avoid being hit. Backed against the curtains, her hair burned at the edges with a bright golden glow from the light outside. She looked hard and competent, but also at that moment, very beautiful.

"Look," Quist said, "I don't know who you are or what you're doing here, but I haven't got time to play games with crazy women. If you have a job you want done, then tell me and I'll do my best to do it. If you're just here for fun, then I suggest you go somewhere else where the getting is easier and it isn't going to cost you fifty credits a day plus expenses."

The girl seemed about to say something, but kept quiet. Without looking at him again, she crossed the dusty carpet and disappeared through the inner door. A moment later the other door closed very hard, and footsteps diminished down the corridor. Quist sat still for a long time, then got up and went to the window. The curtain blew in as if holding back something invisible outside. He closed the window with a slam and went

back to the desk. Then he waited. Ten minutes.

The man, when he came, was much as Quist had expected him to be. His footsteps in the corridor were enough warning. They plodded, not unhurried, but unhurriable. One shoe squeaked, pitifully, like a weak and feeble mouse.

He paused outside the door for a long time. By craning his neck, Quist could see his shadow thrown on the dusty glass. Short, square-shouldered, but a little stooped; a feeling of bulkiness about the arms and chest. When the door opened, Quist knew what to expect. Policemen are much the same all over the universe.

He came through the anteroom with a slow glance to left and right, not cautious, just curious. If there had been five armed men waiting for him there, he would not have cared. Armed men he could handle. His face, rough-skinned and lined was that of a man who had seen a lot of brawls. There were no scars—he was too good a fighter for that—but the fights showed just the same.

At the door he stopped, looked around, then turned his eyes to Quist. He watched him at length, but without interest, and Quist looked back, noting the loose, rather shapeless suit, the clean but unfashionable collar, the hands, square and hairy that hung at his sides. The room became very quiet.

"I liked you better as a blonde," Quist said.

"What?" The man's face registered nothing, but his voice had a thread of shock that confirmed Quist's theory immediately.

"I said 'I liked you better as a blonde.'"

"Meaning . . .?"

"Meaning that I'd be a pretty poor detective if I couldn't tell the difference between a real policeman and a girl in a Dyker Change Suit and a rubber mask. Why don't you get that off? It must be a hundred degrees inside there."

The figure of the man in the doorway seemed to sag a little. One hairy paw grasped the other, and Quist watched with a sort of horror as it peeled away the flesh from it, revealing a thinner, whiter hand beneath it. Cleaned of the rubber, her hands went to head and the rough-lined face of the policeman crumpled and contracted into a wrinkled ball. The girl shook her head so that the hair flared out into a cloud, and breathed deeply.

"At least one hundred," she said. "And sweaty, too."

"Why do you keep using them?"

"What else is there?"

The rest of the policeman character disappeared as she peeled off the suit. Underneath she wore the same tight jacket and culottes that Quist had admired earlier. "Not spectacular," Bookworm had said. He was right, Quist knew, but . . .

"I don't know all that much

about criminology," Quist said. "But I seem to remember that the newest wrinkle is a kind of polarizing cloth that you can sensitize to give back almost any gradation of shade and color you want. You just put on a suit and mask of this stuff, treat it to make you look like anything you want, and the problem is solved. Not as uncomfortable as the Dyker, and a lot harder to detect."

The girl rubbed her back, massaging feeling into her muscles.

"That webbing is agony." She leaned back. "How do they get the movements right? Just a suit isn't going to make you move like a man, or stand like him."

"If you want trade secrets, you'll have to pay for them," Quist said. "What are you doing here?"

"Checking. What else? You've been under surveillance ever since you arrived."

"I know."

She frowned. "Are we that bad?"

"I've seen worse," Quist lied.

"Criminology hasn't got very far on Napoleon," she said. "We don't have nearly enough criminals."

"I wouldn't say that." He paused. "I'm starting to wonder if everybody on the planet isn't a criminal."

"That's silly."

"Is it?"

They exchanged a long glance with no concessions on either side.

"Well, there's no point in my being here now," she said finally.

Quist stood up. "I'll send you a copy of the specs for that suit I told you about."

She said nothing.

"And give my regards to Mr. Addison."

She frowned. "Mr. Addison?"

"The man who's been following me. A tall man with a beard."

Her face was puzzled and amused at once.

"I'm the agent who's been following you," she said. "And I think you know I couldn't fake extra height *and* a beard."

Quist felt his mind begin to spin. If the tall Mr. Addison was not an agent, then who was he? He did not hear the door open and close, the footsteps disappear down the hall. When he turned, the girl had gone. He never saw her again.

Quist stared at the door for a moment and then frowned. He had a sudden feeling that he had made a mistake. What was the point of the policeman masquerade? When he thought about it, there could be only one point: Because, they really wouldn't have expected to fool him, and even if they had . . .

He scrabbled in his drawer for the book and turned the pages hurriedly. After he had made his notations, he stared at the figures morosely. No, there wasn't any doubt. Even when you had the formula, you couldn't anticipate everything. It all depended on probability, and you could only properly figure one move at a time —with certainty, at any rate. Until

he knew which one of a number of probabilities occurred at any given time, he could not plot the results to be expected from the occurrence.

All that this rationalization of his failure meant was that he had simply been distracted at least fifteen minutes too long. The girl had been a plant, a sop to his vanity, a trap that had worked. Because there wasn't any doubt about what was going to happen, or that he would be too late to do anything about it.

They were going to kill the little man before he got to him. Quist cursed himself with great sincerity and ran out of the office.

V

The museum was new, but its design was the traditional block of Napoleon 6, gray, slab-sided, thick-walled, solid. It lay like a beached whale across two city blocks, hulking against the sky over Quist's head. He looked up at the huge gray wall, crazed with cracks from minor earthquakes, and swallowed down the feeling that the whole thing was about to fall on him. Then, without checking his figures again—he knew them too depressingly well already—he walked up the wide steps and into the building.

The smell hit him at once. It was the smell of all museums, the must of dry bones and damp wood, of rock and hides, sweat and stale air. He glanced around at the foyer, but there was nobody in attendance. The door to the interior was open. He went inside. He saw at once that the museum of Napoleon 6 was not an ordinary one. Nothing, he was finding, was quite what it seemed on this planet. Forgetting his job for a moment, he looked around the huge main hall that took up a good part of the building's mass. From around the walls a thousand eyes looked back at him, some in agony, some without feeling, all without life. The museum was not only a storehouse of knowledge. It was a reminder of what it had cost to colonize Napoleon 6, a cost only measurable in human lives.

There were a thousand ways to die on Napoleon 6. All of them were commemorated in the museum.

In the center of the hall, raised a few feet in the air on a dais, was a ragged air-bubbled ball of natural glass, liquid red in the dull light from the high and dusty windows. He moved closer, curious. There were blobs in the glass—irregular dark patches that somehow seemed familiar. He looked closer still.

The blobs were men.

None of them would have known what hit them. The gout of molten glass, blown from a vent in the side of the mountain they were scouting, had caught them forever in their last agony, and left them preserved like flies in amber. Through the glass their faces stared out at his, uncomprehending.

There were more. Skeletons bound in the embrace of hardened rock, their bones jutting out like those of the earth itself, corpses calcined by salts and dissolved by acids; models and diagrams of what happened when molten lava wiped out a whole city, or families were sprayed by the poisonous fumes of sulphur or phosphorus. Obolensky's hand was evident in the displays. As long as he was Boss, nobody would forget what it had cost to win Napoleon 6.

Quist took one last look around the grim graveyard and went up the staircase that curved round the wall of the gallery. The little man had said he would be in the gallery. Perhaps, if he were lucky, he would still be alive.

As he went up the stairs, the feeling of being watched intensified. It could be the dead eyes of the exhibits—but it seemed different. He glanced around, saw nothing, and went on.

The gallery was different. Here, there was less emphasis on death and destruction. There were the more traditional glass cases, trays of gems and shells. Quist peered around but the place was empty. Quietly, he went on down the silent aisles. At the end, he turned to look over the rail at the hall below.

Somebody moved down there in the pit, among the exhibits. Quist strained his eyes but there was no way of picking the man out from the shadows that surrounded him. He stepped back from the rail until he was out of sight from below, then moved quickly around the gallery to the other side. The floors, thick concrete covered with matting, muffled his footsteps. With luck, the man would think he was exploring the upper levels and not realize Quist had seen him.

It took him a minute to get back to the floor of the main hall. At the foot of the steps he stood in the shadows pinpointing the source of the movement. It had been to his right, about halfway along the wall, by a lump of rock inside to which were welded the bodies of three men. Inching along the wall, he slowly moved into a place where he could see the man who stood in the gloom beside it.

He saw the little man first. He lay like a suppliant, face down before the cratered stone. Predictable to death, he still wore the same gloves, the same worn suit.

Beside him stood the man Quist knew as Addison. In his hand he held the brown paper parcel Quist had come here to get. He was turning it over in his hands, looking at the wrapping as if he hoped to see through the paper and into the interior. Quist studied his face, half lit from the light above. It was an odd face, almost impossible to categorize. Not like the faces of other men on Napoleon 6. With a momentary shock, Quist decided that the face it most resembled was his own.

Addison finished his examination of the parcel and slipped it inside his overcoat. It was quite a small parcel, hardly big enough for even a little man to die for. Odd, he would never have picked Addison for a murderer—in fact, he could not figure Addison at all. The doubt kept him hanging back for a few seconds, debating how he should approach the situation.

The delay was fatal. In those moments, Addison stepped out into the hall, moving a few vital yards from Quist.

"Addison!"

His voice eched in the high hall, and Addison bolted. Quist ran towards him, but the bearded man was like a rabbit, dodging among the exhibits with a speed that Quist could not match. He was two yards behind him at the door, and when he got to the top of the steps, he had already disappeared into the crowd on the streets.

Quist stood for a moment on the steps, cursing, then went back to the body of the little man. It needed only a short examination to find that he had been killed with a blow to the side of the head, an almost casual attack that probably would not have killed most men, or even stunned them. Looking down at the limp body, Quist felt a touch of pity. He had not been born to live a long time.

Meticulously, he went over his clothes. There were the usual bits and pieces—money, handkerchief, a key ring. He glanced at the key ring, then turned it over in his fingers. Three keys—and a shred of plastic still hooked on the ring. He recognized it as the stub of an identification tag, but the rest of the tag had gone. Somebody had not wanted him to know who the little man was.

Quist hunted around in his memory of the system used on Napoleon 6. An id tag was just the copy of a tab kept in the central records bureau. Not everyone knew that—civil liberties were still paid some lip service—and there was a chance that the person who had destroyed the tag had not remembered the copy in the files. It was a chance worth taking. If he could find out the little man's name and where he came from, some of the charade might begin to make sense.

He left the museum and hurried across town, his mind busy with the problem set by the ripped identification tag. Who had torn it off? The question, he realized, was the same as a much larger one—who had killed the little man? The obvious answer to both was Addison. And yet that had a false ring to it. Somehow, Addison was . . . not the type? Quist queried the words, but found no fault in them. Addison was just not built like a murderer, mentally or physically.

Quist felt one of his theories coming on. There was a way this could be proved. But he would have to hurry.

The population register building was as unobtrusive and anonymous as the museum was bizarre and vast. Squeezed between two other office blocks, it cowered in the shadows, poking one shy corner of its facade out into the slanting afternoon sun. The streets around it were fairly clear, without any sign of government agents. That was good—so far, his theory was working.

Inside, there was an information desk, with nobody behind it, and a pair of double doors leading into a long room full of filing cabinets. A few people worked at the cabinets, sorting and filing the same small plastic tabs that the little man had had on his key ring. The only difference was that these were longer, the extra space taken up by the complex punch-code holes of a data-processing system. By Earth standards, this sort of filing was centuries out of date, but on Napoleon 6 it still had its uses.

Ignoring the clerks, he browsed along the aisles, glancing over the cabinet tops at the other people in the room. They seemed normal enough, men and women going about a job they hated with the only approach they could reasonably adopt to it—bored absorption. He had discounted almost all of them, when a familiar movement of a shoulder caught his eye. He stopped and watched Addison sorting through a drawer of cards.

He had expected to find Addison here—had depended on it in fact, to prove his theory. Despite the appearances of the little man's death, it had not been Addison who had killed him. Government agents had done it, perhaps while the blond girl was distracting him in his office. Addison had found the body, probably only a few moments before Quist arrived.

It had to be that way. If Addison had killed the man, he would have seen the identification tag and known who he was. But if a Government agent had taken it and Addison had only found the body, his first impulse would have been like Quist's—check up at the bureau. Addison had done well so far, but for the first time Quist thought he understood what made the bearded man tick, what he was after.

Quietly, he moved along the aisle to where the man stood, absorbed in his task. Addison didn't hear him until he was only a few feet away, too close for him to run away again.

"Hello," Quist said, "read any good detective stories lately?"

VI

If Addison was surprised, he didn't show it. Without looking at Quist, he carefully noted down the details from the card in his hand, dropped it into his pocket, and slid the drawer shut. Only then did he look up.

"Did you say, detective stories?"

"That's what all this is about, isn't it?" Quist asked.

"I thought you'd never guess," Addison said, smiling.

"It took some time, but I caught on." Quist looked around the office. "Can't we find some place more private?"

Addison glanced about worriedly. "Yes, I was just thinking . . ."

He stopped, looking past Quist's shoulder at the main door. Quist turned. Outside the slightly frosted glass he could see men clattering up the steps—men in green uniforms. The police.

"Up here," he called to Addison, pointing to the steps leading up to the second floor of the office.

They ran for the stairs, shouldering people out of their way. There was a shout behind them, then the unmistakable hiss of a pistol. With a sound like a whipcrack, a beam passed over their heads and scorched a hole in the wall somewhere over to their right. Quist ducked, and ran harder than ever for the stairs.

There were seven stairs before the flight turned into the next floor, but it looked like seven miles to the fugitives. Quist pounded up, shoving Addison ahead of him like luggage. The tall man stumbled, but Quist's hand kept him steady, catapulting him round the corner to safety. Then Quist fell on top of him. Behind them there was another blast, and the stair balustrade disintegrated into a mass of bubbling plastic. By that time it was too late. They were on the top floor.

The office they ran into was empty except for a startled junior assistant. Ignoring her, Quist and Addison grabbed a heavy filing cabinet, manhandled it to the stairs, and toppled it downwards, where it jammed across the turn, making an effective blockade.

The girl looked at them in stunned amazement.

"You can't . . ." she began.

"Yes?" Addison snarled.

"Nothing," the girl said weakly.

"Then shut up." The last words were said over his shoulder as he hauled himself onto the windowsill and shoved the window open with his foot. He glanced at Quist.

"Up here."

They crawled out onto the outside sill. Below them, police milled about in the streets, but all their attention was focused on the ground floor. Quist and Addison wasted no time in wondering how long it would be before somebody looked upwards and saw them inching their way along the parapet. There were enough things to worry about in just staying alive.

If the stairs had seemed seven miles high to Quist, then the parapet was seventy miles long. Each inch took an eternity, every breath sounded loud enough to attract the attention of the whole crowd below. But then the corner was a foot away, another step—and they were

there. Ahead of him, Addison leaped the gap between the office and its next door neighbor, bent double, and scuttled across the roof. Quist followed him. They collapsed into the darkness of a steep stairway leading down into the building, and tried to get their breath back.

"Hadn't we better get moving?" he asked after a moment. "They'll be looking over here shortly."

Addison unwound his jointed length from the floor.

"They won't find us. I know this place from back to front. Down here." He disappeared down the stairs. At the foot was a heavy door. Addison ignored the lock and leaned heavily against the frame. It creaked, then sagged visibly away from the door. He pushed it open.

"They're all like that in these places. The quakes have put almost every building out of plumb."

He waited until Quist was through, slipped into the corridor, then let the door swing shut again. They were in the dusty hall of what looked like a hotel. Numbered doors lined it, and the smell of must and staleness was thick in his nose. Addison walked a few yards along the corridor, glanced up and down checking his bearings, then launched himself with all his weight at the wall. Quist blinked in astonishment. A sound made him look back to the door. Slowly, like the contracting of an eyelid, the door frame was straightening up. The door, rising again into the vertical, swung shut with a satisfying crash as the frame grabbed it in a viselike grip. Quist tried it experimentally. It was firm, locked from this side, so tightly in fact, that it might never have been opened.

"That's a handy trick."

Addison dusted his hands, "You have to know these places," he said. "The walls are all out of plumb, but if you figure the stress points, you can shift almost anything around. They'll come to this door, find it locked, and assume we're well on our way." He looked round. "This is a bit public, though. We can hide out on one of the lower floors."

As Quist had guessed, it was a hotel, but old and deserted. They found a room full of furniture hulking under gray dustcloths, and sat down to wait for dark.

"Question time," Addison observed, collapsing onto the bed. A cloud of dust rose around them like a nimbus, making him, and by association the whole thing seem unreal and unlikely.

"There are a few things I'd like to know," Quist admitted.

"Like: Who I am. What am I doing here. How did I find out about you. Did I kill Sharkey . . ."

"Sharkey?"

"Your little man with the package. The answer by the way, is no."

"I didn't think you did. But you got the package."

Addison pulled the parcel out of his pocket and laid it carefully on the bed beside him.

"I did. We can talk about that later. First things first."

Quist looked at it, then back to Addison.

"I know most of the 'first things,' I think. Who you are—your name is Melville Addison, age thirty-seven, employed as research reader in the School of Economics & Sociology at Napoleon University. You are here because you stumbled on my reason for being here, and for advertising myself as a private investigator. And the reason you stumbled onto that is that you have an unusual hobby."

Addison sat up slowly. "How did you find out about that?"

"Easy. There aren't many people on Napoleon interested in detective stories."

"You don't miss much," Addison said. "I thought you were totally in the dark."

"I was, until a few hours ago. Then I started to think how odd it was that you could follow my movements so easily. It couldn't be that you were a good shadow—it wasn't that easy. It had to be that you understood what I was doing. And if you understood that, you had to be a detective-story fan. How long have you been on the track?"

Addison moved restlessly around the room as he spoke. "Only a few months. I shipped out here eight years ago to take a chair at the University. For a while, it was a conventional enough job, but after a while I began to notice . . . well, gaps, if you know what I mean. Places where there were things missing, attitudes that just didn't exist. Nothing obvious, just little omissions that you wouldn't notice if you weren't by nature a little suspicious."

"Like Holmes," Quist said.

"The dog that didn't bark? Yes, that's it. The clue that wasn't there was the best clue of all."

"With me," Quist said, "it was the geological survey. Magellanium wasn't listed, but, of course, it should have been. There's always magellanium, though usually not enough to make mining it worthwhile. It looked to me as if somebody was bending over backwards to make sure that nobody did any mining here—did anything in fact to draw attention to the place."

"I noticed the people most," Addison said. "That close-mouthed attitude among some of the older ones, the way they step so carefully in their conversation. They're hiding something—and the whole planet is starting to get this syndrome, even though most of them can't know what it is they're hiding or what they're frightened of."

Quist nodded. "I saw one of their parades. It was depressing. They've lost all their gaiety, their pride. They're frightened. But what of? I don't understand."

Addison delved into his pocket and extracted a slip of plastoid. "This might help." He tossed it to Quist, who looked at it with interest.

"The little man's id card. I forgot that's what we were looking for."

"I know the punch code," Addison said. "He came from Pittfalks, one of the mountain towns. From the way he talked and dressed, I'd say he'd been there most of his life. It'll be a good place to start looking."

"Before we start looking," Quist said, "hadn't I better look at the parcel our late friend had?"

Addison picked it up from the bed and dropped it into Quist's lap. His face lost some of its humor. He looked grim.

"I've already looked inside," he said.

"And?"

"See for yourself."

Quist worried off the string and unrolled the crumpled paper. Inside the parcel was a lump of black volcanic rock, stained with streaks of rust and a few threads of natural glass. He looked at Addison, puzzled. "This is it? Rock?"

Addison shook his head. "It splits. See the crack?"

There was a narrow fissure under Quist's fingers. He pried at it until the rock cracked neatly across.

Inside was a doll.

Or at least it looked like a doll. It was small, with simplified features, articulated arms, made of some soft fleshlike material that did not seem to have been harmed by the molten rock that had washed over it. But as Quist studied the manikin, he saw other things he could not account for.

If it were a doll, the construction was surprisingly complex. In a few places, the plastoid had shredded away from the frame and inside he could see a maze of machinery as complex as that of a watch. And there was the face. It seemed odd—but he didn't know why. He glanced up at Addison.

"A doll?" he said.

"Something like that. I don't know. When I've had time to test it I'll . . ."

"What do you think it is?"

"I don't know what to think. Initially I was intrigued. Now I find myself terrified."

Quist looked at the man in surprise. "Terrified?"

Leaving the bed, Addison moved to where Quist sat, and took part of the rock shell from the parcel on his lap. He crumbled a piece from the edge and rolled it in his fingers.

"I don't suppose you noticed this," he said quietly. "Igneous rock, not especially interesting unless you study it. But I know a bit about geology. This is far from typical of that black basalt that passes for landscape out here. This is softer, rotten in parts, almost soil when it's wet."

Quist began to understand.

"Older, then?"

"Much older. It dates back . . . well, I can only guess. But my estimate would be that the rock, and of course, the doll—it must follow—are something like half a million years old."

VII

Quist and Addison crouched in the shadows, peering along the dim tunnel that stretched ahead of them for at least a hundred yards before fading off into the gloom. Water dripped from the roof continuously, an occasional fat drop landing in Quist's hair, or worse still, coursing down his spine.

If Addison minded the discomfort, or even noticed it, he made no sign. Addison, Quist was beginning to realize, had the nature of a master criminal, even if his profession was a quiet one. Not everyone had the nerve necessary to follow up his theories the way Addison had, nor to risk nine sorts of police action in a harebrained scheme such as the one they had hatched together in the hotel room. Quist thought about the plan a little more, then quickly changed his mind to other subjects. It was too frightening to think what might happen if it failed.

"I can't see anything," Quist said. "How about you?"

"No. It seems quiet enough—but let's wait a little longer."

There was spell of damp dark silence, broken only by the *plink* of water into the puddles on the floor, and an occasional squeak, far away and remote, which belonged, Quist supposed, to a bat. Only bats would be unimaginative enough to find these catacombs pleasant.

"It seems safe enough," Addison said eventually, stepping forward into the tunnel center. Quist followed him and peered into the dark.

"How far up is the station?"

"A hundred yards. Maybe less, I don't recall too well. I used to come down here a lot once. I remember . . ." He stopped, glanced at Quist, and cleared his throat. "Well, we won't go into that. Follow me—and remember, no noise."

They stumbled along the narrow tubular tunnel, fumbling with their feet for the path and trying to avoid the black pools of water that covered much of the ground. After he had stepped up to his ankles in two of them, Quist gave up and sloshed gamely forward, ignoring anything smaller than a lake.

The floor had once been bitumen, or dressed stone, but it had been cracked and crazed by so many quakes that any semblance of evenness was lost. The walls were not quite as bad, perhaps because most of them were lined in plastoid into which the wiring and stanchions had been set. Sagging patches in the lining showed that the rock behind it was not always firm, but it was only in a few places that the walls themselves had broken.

Under his feet, Quist felt the floor

change subtly, become a little more level and less cluttered. He looked up. Ahead of them, just visible in the dim light, was a narrow platform jutting out into the tunnel. Doors yawned on the far side of it, exposing steps leading up, he supposed, to the surface. Standing at the platform, forlorn, faintly ridiculous, was what looked to Quist like a big, battered bird cage.

"Is that it?" he asked incredulously.

Addison looked piqued. "Perfectly sound really. These things were built to withstand earthquakes."

Quist grabbed a stanchion and shook it. Somewhere deep in the mechanism, a spring parted with a despairing metallic sigh. He looked pointedly at Addison.

"It'll be all right, you'll see." He hauled himself up onto the footplate and examined the dim interior. "Besides, we don't have much choice. They'll be watching everything else."

Quist shook his head, first at the tram, then at the undeniable fact that Addison was right about security precautions. The police would have guards out everywhere. It was only a bare possibility that none would be on this old underground scenic railway. Abandoned for several years, it offered about their only chance of getting to Pittfalks, and any chance, no matter how remote, was worth taking. Muttering an incantation that might, to less rational ears, have sounded like a prayer, he hauled himself into the vehicle and glumly took a seat.

"Ready?" Addison called.

Quist didn't answer, but took a firmer grip on the rail in front of him. In the cab, Addison breathed deeply and pulled a lever.

The effect was immediate and startling. Riveted in his seat, Quist felt every hair on his body abruptly spring into the vertical, as if a mild electric generator had been plugged into the base of his spine. He yelped. All around the passenger cabin, sparks leaped like blue devils from rail to rail, lighting the ormolu elegancies of the brass decoration in an eerie violet glow. Underneath the floor, something was imitating a giant meat mincer devouring a live rhinoceros, a sound that made every spring and rivet in the cage howl with vibration.

Before the sound had risen to even half its potential resonance, Quist was on his feet and heading for the door, but he had only gone two steps when the world abruptly turned upside-down. Desperately, he watched the walls begin to lean, the floor to tilt. Grabbing a stanchion, he hung on almost calmly as the cab moved from vertical to horizontal, then into a complete roll. Dust, mud, water, bits of wood, and a few pounds of miscellaneous components showered down on him as he stood, shakily, in the center of the cab, trying to find enough energy to scream.

Somewhere in the miscellany of movements going on around him, Quist detected a hint of forward motion. From the cabin door, Addison beamed out at him.

"We're off," he said. "Make yourself comfortable. We'll be there in no time."

Ten minutes later, Quist had combed most of the rubbish out of his hair, and rediscovered the use of his knees. He was even finding the journey mildly interesting. Once its frozen machinery had been rammed back into action, the scenic tram ran quite well, sliding along in the center of the tunnel on its cushions of electromagnetic current that were smoother than any wheels. Addison's command of gear-changing was sketchy, and such occasions were usually like minor earthquakes, but for the most part he made up for his ignorance with tremendous flair. Watching the walls howl by at some sixty miles an hour, Quist had to admit that this way of getting to Pittfalks had much to recommend it.

Squeezing into the cabin, he leaned back against the wall and watched the dark mouth of the tunnel rise endlessly to devour them.

"How far is it?" Quist called.

"May be one hundred miles—I'm not sure. Most of the scenic spots are farther ahead, and the tunnel twists about a little just there. But we seem safe enough. The police might . . ."

He stopped abruptly.

Quist followed his gaze. There were lights in the tunnel ahead.

"Police?"

"Who else would be down here?" Addison said.

Quist nodded bleakly.

"Any suggestions?" Addison asked.

"My book doesn't cover this," Quist said. "We'll have to play it by ear."

They exchanged a long glance. Then Addison reached for the control lever and dragged it back as far as it would go. Under them, the machine leaped like a startled horse, and lunged forward down the tunnel. Noises which had been simple rattles grew suddenly into thunderous shudderings that threatened to tear the machine apart. Quist grabbed a handhold, braced himself, and crashed his foot through the front window. It sagged, the plastic frame fell from its rotten surround, and a blast of cold damp air hit him in the face. Half-closing his eyes against the wind, he sent three shots down the tunnel in the general direction of the lights.

In the brief flash from the explosive bullets, he glimpsed three men standing in the tunnel, one of them with a lamp, the other two holding guns. Obviously a routine patrol sent down to check on a remote possibility. The tram was almost on top of them now, and Quist gambled that they would be too surprised to offer much resistance. He snapped off two more shots, and this time

saw the lamp discarded in the center of the tunnel. A moment later they had overrun it. Two shots smashed into the back of the cab, but neither did any damage, and soon they were well out of range.

Addison gasped out the breath he had held for at least a minute. "We were lucky," he said.

"Yes. We were—that time," Quist said. "I don't fancy our chances with the next lot."

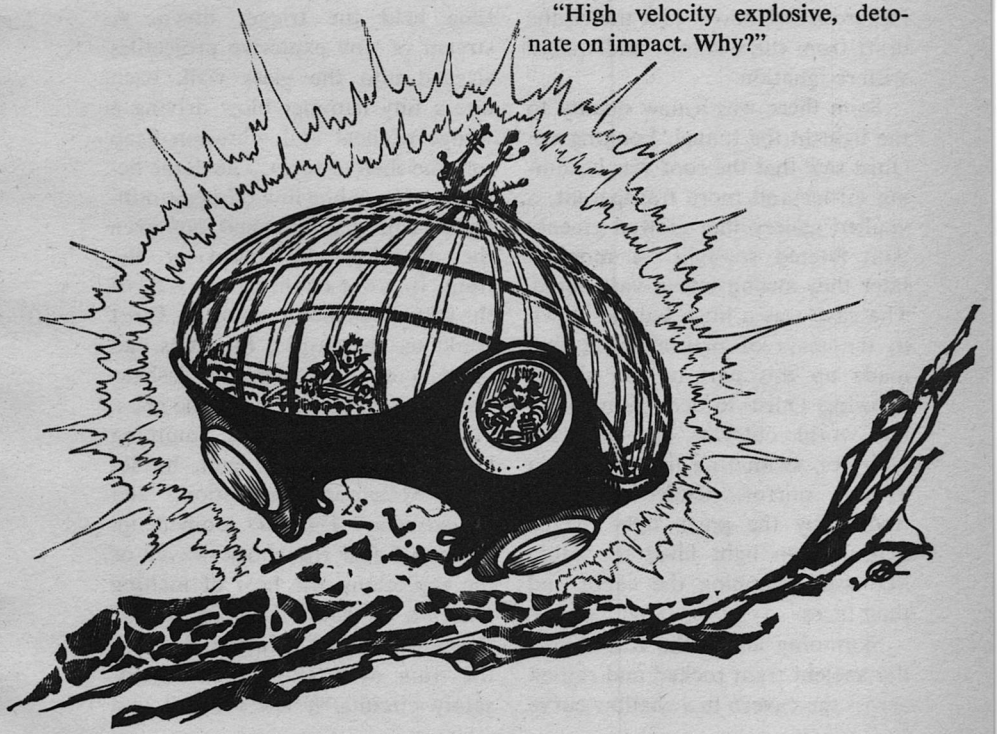
Addison frowned. "They'll probably wait somewhere in the glass caverns. The tunnel's so twisted there that we couldn't go fast if we wanted to."

"Is there any place nearer where we can get off the track?"

"No. There aren't any stations this far out. People used to make a day trip out here to the caverns. It was . . ." He stopped. "What sort of ammunition does that gun have?" he asked.

Quist took a clip from his pocket and held it up for Addison's inspection. With his thumb, he squeezed out one of the hundred projectiles the clip held, letting the match-head sized bullet roll onto his cupped palm.

"High velocity explosive, detonate on impact. Why?"



Addison indicated the walls of the tunnel sliding by outside the cabin. For the first time, Quist noticed that the polished rock was interspersed with streaks of volcanic glass, flowing like milky emerald across the porous black stratum.

"Would it go very deep into this?"

"A foot, maybe . . ."

"That should do it. Load up a full clip and be ready to shoot when I tell you."

Quist opened his mouth to ask the inevitable questions, but Addison had cut in the throttle again, and the sounds of tortured machinery made conversation impossible. He crouched down, just under the draft from the window, and waited with resignation.

Soon there was a new quality to the light in the tunnel. Looking up, Quist saw that the roof was becoming loftier and more transparent, a vaulted gallery that glowed greenly with filtered sunlight. A moment later they swung into a vast dome. The cave was a huge bubble blown in the mass of natural silica that made up this part of the planet, allowing Quist to see glimpses of the world outside; but distorted glimpses, swimming like images in a crazy mirror, sicklied into grotesques by the green light of the glass. Green light filled the cabin like water, lapping the cabin and their faces.

Skimming above the tracer line, the ancient tram rocked and rattled across the cavern in a shallow curve that could take it in a swing around the bubble, then out through a narrow tunnel a few hundred yards across the flat floor. Once they were in there they were trapped. Quist looked up at Addison, anticipating his plan. Addison looked around, pointed to Quist's gun and nodded. Steadying his hand against the rearing motion of the cab, he sighted at the far side of the cabin, took a deep breath, and fired.

The first shots were ranging ones only, sparkling in a random pattern over the face of the glass. Quist allowed for the cab's more subtle oscillations, sighted again, and this time held the trigger down. A stream of tiny explosive projectiles slashed into the glass wall, each one a tiny hammer blow driving a wedge of heat and vibration deep into the shell of silica. The dome began to ring, a howling off-key tintinnabulation that drowned out even the groaning mechanism of the tram. In front of them, the wall of the dome was looming nearer. Quist could see the fissures his shots had made, note every separate flash as the bullets exploded inside the glass.

But it was still intact. Jamming another clip into the gun, he set it to "Maximum penetration," and blazed away. The wall loomed up. He could feel the shock waves of the explosions, the heat of melting glass on his face. Addison twisted the controls one last inch and heeled the tram over. With a scream of safety circuits, it left the rail and

wobbled crazily towards the wall, balanced on its rickety electronic legs. Quist closed his eyes, ducked, and emptied the gun into the wall. Then he waited for the crash. But there was none. The grinding crunch started, then ceased almost immediately. Bits of debris showered down on him, and something hot brushed his hand. Then he was blinking in the sunlight. Squinting through the door, he saw farmland and haystacks skimming past a few feet from him. He stood up limply.

Behind him, the green glass dome, once a lidded eye that had peered suspiciously out at the countryside, now stared black-pupiled at the startled landscape, its iris starred with black blood-shot cracks. As he watched, the cracks widened, connected, and with a grinding like a steel skyscraper collapsing, the eye caved in.

Quist watched horrified, as the dome disintegrated into a smoking pile of dust and rubble, leaving a crater into which the upper parts of the mountain were beginning to slide. Addison glanced at the spectacle, and turned back to the controls.

"Yes, I thought something like that might happen."

He wrenched suddenly at the lever and heaved the tram over a stone fence, leaving a few feet of brass stanchion jammed between some of its upper stones. Quist, his stomach turning over, hung grimly onto a rail and watched the fields go flying past only a few feet from his eyes. The tram's repulsors, designed for the relatively gentle work of supporting the vehicle in a smooth cylindrical tunnel, were heaving like exhausted beasts at the demands Addison was making on them. Each time he hauled the lever around to skim past a tree trunk, or dragged it back to leap a farm house, the generators howled at a higher and more frenzied pitch.

Addison bent down and shouted in Quist's ear.

"Not too far now—only about five or six miles as the crow flies." He grinned—maniacally, Quist thought. "I say, isn't this fun?"

For once in his life, Quist had nothing to say.

VIII

They didn't quite make it to Pittfalks, but looking back at the crater of the glass dome, now only dimly visible on the horizon, and the nearer ruin of the tram lying against a tree, smoke trickling from its burnt-out generators, Quist was forced to admit that the old rattletrap had done very well. Then he turned away and addressed himself to the immediate problems of scaling the rough and nasty road to Pittfalks.

From the plain, Pittfalks Hill rose like a huge castle—black, volcanic and sinister. Patches of earth sown with greenery clung to its sides, but most of the mountain was glossy

black rock, overlaid with the gray porous foam of pumice and ash. At the top, the town hung like a shabby collar around the neck of the hill, dribbling raggedly down to the lower levels in landslides of slums and rubbish tips. There was only one way to get to it, along a narrow twisting road whose ash surface was so ravaged by rain that it had all but eroded away. Struggling up the one-in-five grade, their shoes full of cinders, Addison and Quist were almost ready to wish that the tram had held out a few miles more.

Collapsing wearily onto a rock, Quist looked back down the road towards the fields they had crossed.

"Can you see anything?" Addison asked.

Quist shook his head.

"They're out there somewhere I suppose. We can only hope they don't know exactly where we've gone to. Breaking out of the dome must have put them off a bit."

Addison grinned reminiscently at Quist's mention of the dome and, fired with enthusiasm, stepped up his walking pace. Quist hauled himself up off the rock, cursed all enthusiasts, and set out after him.

Pittfalks was every bit as sinister as the mountain on which it was built. Wooden shacks clung to the steeply slanting hill, canted like grotesque wading birds on their unequal legs, while blockhouses of ash adobe stood among them, slowly disintegrating into mounds of gray-black mud. The few people they saw shambled about without interest, as gray and lifeless as the ash among which they lived.

Addison looked bleak. "The address is 7 Resub Street," he said.

Quist looked around. There was only one street and they were in it. They walked along the middle of the road, found a shack with a number, then backtracked till they found seven. It was typical of the town, a leaning wreck of a house whose timbers had been bleached by the weather to a ghostly gray. The door hung open on its hinges, but dust drifts on the verandah showed that nobody had taken advantage of the silent invitation to come in.

"I don't think we need knock," Quist said, pushing aside the door, which promptly collapsed.

Inside, the house's one room was drifted deep in ash that stirred silently as they walked through it. Under the coating of dust, they could see signs of recent habitation —a portable stove, a tumbled pile of woven stuff that might have been a bed. Sharkey had only been in the city a few weeks, but already the dust had taken over, obliterating almost every sign of his presence. Quist felt obscurely sad for the little man. He was doomed to be forgotten. Every mark he made was brushed away by an unkind fate as soon as his back was turned. Except in his effect on other people, he did not exist at all. Perhaps that was why he had come to Quist with the

relic. It gave him the faint promise of stature, the opportunity to be, if only briefly, a human being. But even that had failed, and he had sunk again, for the last time, beneath the gray surface of his destiny.

Addison was poking around at the back of the hut, probing behind the piles of musty garbage.

"There's something here," he said quietly, hauling back a leaning pile of rubbish.

Behind the crude camouflage was a trapdoor set into the floor. Quist mentally checked his picture of the house's design. It was built lower than the others, and in one spot it did touch the ground, though the appearance was similar to the others that were raised on stilts above the ash. It could be accidental that this house was one of the few that could have a cellar. Or it could be very ingenious planning. Quist suspected the latter. There was entirely too much brain work evident in the placing of the trapdoor to make it a likely accident.

Addison probed at the trap and levered it upwards, revealing a square of total blackness. Quist's torch probed into the hole, brushing a sagging length of shoring timber and a crumbling wall of rock.

"It probably isn't safe," Addison said doubtfully.

Quist steadied himself against the wall and backed gingerly down the ladder inside the trapdoor. His smile was sardonic.

"Scared?" he asked, and disappeared into the darkness.

Addison opened his mouth to reply, closed it again, and followed the other man.

Groping in the darkness, Quist wondered what he was doing here. All his training cried out against taking such a step, but something about this case was making that warning voice harder to hear and easier to ignore. Addison was mostly to blame of course. The man was insane—or perhaps just an enthusiast on a scale Quist had never encountered before. Whatever its ramifications, his disease was catching. Backing down the rickety ladder into a pit that might offer anything from asphyxiation under tons of wet ash, to a spider bite, Quist belatedly realized that he had come down with a bad case of galloping hunt-fever. He could only hope it wasn't fatal.

At the fifth step, Addison felt wet ash under his feet and gratefully took out his torch. The chamber was small and damply claustrophobic. Timbers of considerable dissolution held back the walls, most of them ash-veined with crumbling volcanic rock. Above him, he could see the faint square of the trapdoor, but the other exit appeared to be a narrow sloping gallery leading off at the other end of the chamber. His light revealed only a few yards of tunnel before a turn cut off the beam.

"You wouldn't stop now," Addi-

son said anxiously, "would you?"

Quist shook his head and started down the tunnel.

At the turn, they discovered nothing more interesting than another chamber, almost identical to the first. He flashed his light about, and saw walls similar to those in the other cellar. It was only by accident that he happened to glance down towards the floor. When he did, he saw the grave.

It was a precise and workmanlike piece of digging, sharp-edged enough to have been measured with a ruler. He moved cautiously to the edge and looked down. The bottom was not immediately visible, but it seemed to be empty. Addison was watching him nervously.

"Is there . . ."

"No, it's empty," Quist said. "Or it seems to be. I'll . . ."

He took one step closer. It was only when his foot sank easily into the soggy lip of the hole, that he realized how soft the ash was. Hurriedly he pulled back, but by then the whole edge of the grave was crumbling. He called out frantically, but there was nothing Addison could do. Briefly he saw the beam of his torch flash across the roof of the chamber as it flew from his hand. Then he was tumbling into a pool of blackness.

The pool of blackness was wet. His impressions of the fall were garbled and agonized, but the main one was of its brevity. A few seconds tumbling down the hole, clawing at the sides and pulling clods of soggy ash down into his face, had changed almost magically to a tumbling descent in a light of blinding suddenness. Then, at the foot of this, abrupt subsidence into liquid; green drowning liquid.

Spluttering, Quist struck for the surface, forcing his laboring lungs to hold out against the pressure. He came into the air like a blowing whale, inhaled gratefully, and floundered for his bearings. Through his stinging eyes he saw the edge of the water, a pool's balustrade, and struck out for it, hauling himself up onto the dry path and gasping until he got his breath back. Then he looked around.

He had landed in a pool. More like a lake really, because its edges curved away from him in a series of intricate arabesques to lose themselves in the gardens. Or what had once been gardens. Now they were a jungle of vines and weeds that rioted across the paths, shouldering the marble slabs out of their way with slow arrogance. The lake was choked with fallen leaves and slime, and behind him, Quist could see where he had fallen by the gap torn in the green film of vegetation that had gathered on the surface over the years.

Above him, the roof, glowing with opalescent light, curved away like a white sky enclosing the whole chamber. He followed its curve as far as he could, then continued it in

his imagination as it became a sheer wall down which the gardens cascaded a thousand feet to the ground. From outside it looked like a mountain—inside, it was a hanging garden that dwarfed anything he had ever seen.

Stunned, Quist hauled himself onto the path and looked about. New impressions crowded in on him, of the gardens and their strange configuration, unlike anything Earthly, of the plants, their pattern, garbled now by long disuse, but still oddly alien in their texture and color.

Alien.

That would explain a great deal.

Slowly, Quist felt the heat in his blood dying. It had been fun while it lasted, but now he had solved the mystery and it was time to get back to work. Wistfully he took one look at the gardens, at their weirdly beautiful sky; then he started his search for a ladder.

IX

The scene in Obolensky's office was vastly different from that of a few days ago. Gone was the drama and awe. Now the room looked like any office, the men in it like men anywhere who had a problem and were trying to solve it. The greatest change was in Obolensky. From a towering figure the President of Napoleon 6 had crumbled to a tired old man. For years he had been running on his reserves, and now he was ready to collapse. Recognizing this, Quist had scouted the other members of his staff and picked out a few candidates who might do for future presidents. They were waiting outside for his signal. But that particular drama would have to wait.

Obolensky leaned back in his chair, his eyes closed. Quist tried to think of something suitable to say, but his mind suggested nothing. Quietly he took another sheaf of reports and photographs from the desk and leafed through them.

When Obolensky found that the secret of Napoleon was out, he had not resisted Quist's demand for the original survey reports of the first colony. They ran to hundreds of bales, boxes and packets, papers detailed enough to make even a survey team envious. It would take years to evaluate all of the information. Quist could only pick at the edges and send back to Earth what he considered to be vital data.

The first papers in his hand were geological tables analyzing the seismographic survey of the plains, indicating where other remains were likely to be found. Many of them gave unusual readings. Quist was astonished at the number of sites. The whole planet was alive with remains—half of the land must have been under cultivation and settlement, yet not a sign remained. It was impossible to imagine the horror of the seismic disturbance that had ravaged the planet and engulfed

a whole civilization in lava and ash. Even the photographs could only suggest the extent of it.

The gardens, Quist found, were just a hint of what lay under the surface. In his hands he held photographs of cities, power stations, docks, airports, all of which had been cleared away, photographed, then covered again.

He dropped the pile onto the desk.

"I can't believe it!" he said incredulously.

Obolensky opened his eyes slowly, unlidding them with infinite weariness. "Why is it so incredible?"

"But a whole civilization . . ."

"If you had been on Napoleon back in the early days, you might have understood. It was a tough world—the toughest; those volcanoes were unbelievable. They could easily have engulfed a civilization. They nearly got us, too."

"How long after you landed did you find the ruins?"

"Almost as soon as we arrived," Obolensky said, "but it was only a bit of pottery and a few walls. We assumed it was Vegan; they came down through these systems at one time. Then, about six months later, we came across the first city."

"It would have been a lot easier if you had reported it."

"We couldn't—not then. We'd worked day and night for half a year to establish ourselves on the planet. Hundreds had died. We couldn't give it up then, not for a lot of ruins. So I made the decision. The excavations were filled up, the people who found it bound to secrecy. The false report we filed seemed to satisfy the bureau. We thought we'd got away with it."

"You did, for a while," Quist said, "but sooner or later someone would have discovered what was going on. The ethnologists for instance. I wouldn't be surprised if one of them hadn't discovered signs in neighboring systems of settlement around here. They would have run a check soon, and the same thing would have happened."

Obolensky looked up, his eyes pale and lifeless.

"I take it you intend to recommend that Napoleon be quarantined?"

Quist nodded, feeling like an executioner.

"But you'll be amply provided for. There are any number of worlds out here that would suit you. Most of them more pleasant than Napoleon."

There was no reply from Obolensky. Slowly he turned and looked out of the window at the distant black basalt plains. Quist knew what he was thinking. Napoleon 6 was no paradise. It was vicious, uncomfortable, deadly. But it was home. Nothing could ever replace it. Unless . . .

Quist filed his idea away, and settled down to sorting through the material.

The interior of the ship looked al-

most new to Quist when he climbed back into the cabin. At his entrance, Bookworm broke into an uncharacteristic blaze of lights, flickering his indicators up and down the spectrum in a brief coruscation.

"Glad to see me, Bookworm?"

"The phrase has no meaning for me, Quist. I am a machine. Machines have no emotions, emotions being merely . . ."

Quist grinned. "Sure," he said, slapping its casing companionably. "Save the commercial. I've got a job to do. Write me a book."

Somewhere inside the computer, memory banks swung silently into place, connecting up to the printing center deep in its interior.

"What about, Quist?"

Quist leaned back in his chair, and stared reflectively at the ceiling.

"It's about colonization," he said. "I'll dictate an outline."

Half an hour later it was finished. Taking a freshly printed copy off the top of the pile, Quist examined it critically. The cover screamed at him. "Fighting World," by H. de Witt Prendergast. He leafed through it.

Ajax is the toughest planet I've ever heard of, and I've seen plenty. My first hours there were brutal, bloody, almost bad enough to cost me my life. I listened incredulously to the howl of the banshee bears outside as they tore at each other in their savage mating battles. The blood . . .

There was more.

"Is there really a planet like this, Bookworm?"

"Yes, of course. You told me you wanted it to be authentic."

"Where is it?"

"Out about four light-years from here, in the Imperial sector. Mind you, I may have deviated a little from the survey reports—dramatic license, you know—but substantially it's true. I wouldn't advise you to emigrate, if you know what's good for you."

"There's no risk of that. But I have idea that Obolensky and his people might just nominate Ajax as their choice of a new world when referendum time comes round."

He loaded up with a pile of the newly printed books and hauled them to the door.

"I'll spread these around. Off-load the rest. I'll get someone to pick them up. And better warm up the engines—I can't wait to get away from here."

It took a few hours to spread the books around where they would be "discovered" by chance in piles of technical material and novels. Knowing the people of Napoleon 6, he was sure the book's popularity would spread quickly, and what was more important, into the right places. When he was finished, he returned gratefully to the ship. It had been a hard few weeks. The thunder of the engines during take-off was almost a lullaby. He drifted—then woke with a start.

"Bookworm," he said, sitting down at the console, "I'm going to write my report."

"Now? You usually put it off for months."

"Those were the old days. I'm a new man. Record."

"Recording."

Quist took a deep breath.

"In pursuance of instructions, I landed on Napoleon 6—give the coordinates, Bookworm—for the purposes of distributing literature and technical material . . ."

There was more, much more. Descriptions of the interview with Obolensky, the shooting, the meeting with Addison. Then the meat:

"Investigating the situation on Napoleon 6 was rendered almost impossible by the extreme wariness of the people, and the conspiracy of silence imposed on those in charge, by Obolensky's personal popularity. I, therefore, decided to try a surprise-system based on certain facts discovered during private researches into literature of the twentieth century.

"During that period, a type of fiction known as the 'detective story' became popular. In some areas, as much as sixty per cent of the population were continual and dedicated readers of these so-called 'whodunits'."

"Who . . . what?" Bookworm muttered.

"Look it up," Quist said, "and keep recording.

"Forced by the popularity to produce more and better detective stories every month, writers of this fiction formulated, by trial and error, a set of rules and conventions that could be used as motivations and behavior patterns for their characters. After decades of elaboration and exploration, these patterns became stylized to a degree unknown even in the rigid rules of opera. Detective stories became totally predictable, the random element being the actions of the criminal and his motivations, both of which were discovered by the protagonist using the ritual patterns of the form.

"However, despite the popularity of such forms, few people thought to put into practice the ideas of these writers. It was this idea which suggested the form of my inquiries on Napoleon 6. After running the available data through the computer, I extracted a series of tables illustrating the probabilities based on various reactions on the part of those I wished to contact. I then hired an office, advertised myself as a 'private detective' and waited for their reaction.

"As expected, it fell within the range of normal fictional reactions, proving that the writers of these stories had, by continual refinement, hit on an almost automatically exact method of information recovery from the random mass of a civilization. The very people I wished to meet were drawn, by perfectly reasonable curiosity, to con-

tact me. These included the police, and by computing the exact time when their diffidence and caution was likely to be overcome by their curiosity, I was able to anticipate their arrival to the minute. The rules governing other contacts were similarly viable under experimental conditions."

"Quist," Bookworm broke in. "You're up to something."

"What do you mean?" Quist said, groping under the console for a file he had placed there a week ago.

"You know, this isn't like your normal reports. It's . . ."

"Just record it," Quist said, dumping the parcel down in front of him.

"In view of the success of this plan," he went on, grinning now, "I suggest that details of it be circulated to all librarians on active service. I have prepared a schedule of the system and intend to read it into my report."

"The title," he went on, opening the file, "is 'Say It With Bullets.' " ■

Engineering Procedure *From an unknown but astute source:*

"Every new engineer must learn early that it is never good taste to designate the sum of two quantities in the form:

$$1 + 1 = 2 \qquad (1)$$

"Anyone who has made a study of advanced mathematics is aware that: $1 = \ln e$ and that: $1 = \sin^2 x + \cos^2 x$

further: $$2 = \sum_{n=0}^{\infty} \frac{1}{2^n}$$

"Therefore, Eq. (1) can be expressed more scientifically as:

$$\ln e + (\sin^2 x + \cos^2 x) = \sum_{n=0}^{\infty} \frac{1}{2^n} \qquad (2)$$

"This may be further simplified by use of the relations:

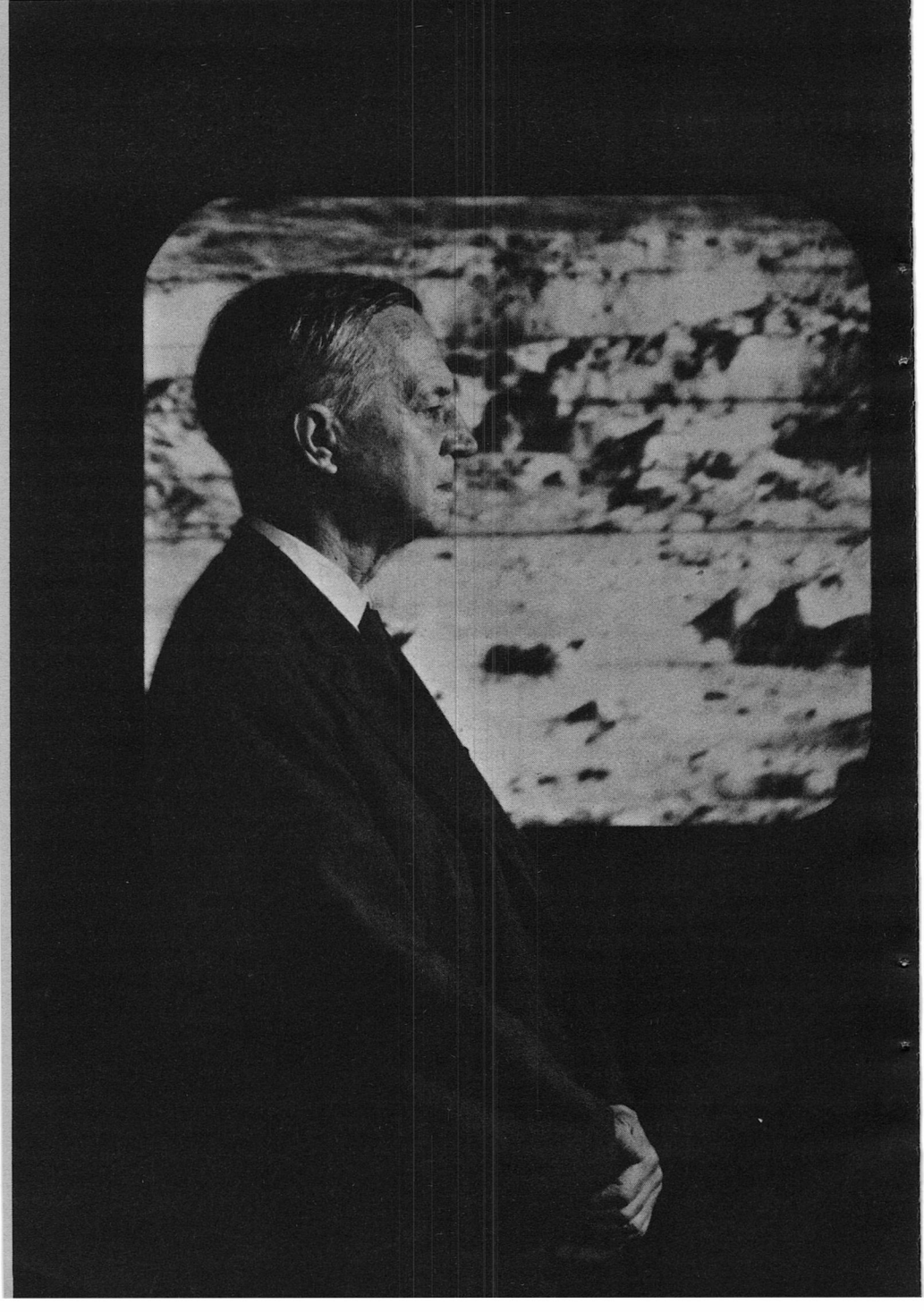
$$1 = \cosh y \sqrt{1 - \tanh^2 y} \quad \text{and} \quad e = \operatorname*{Lim}_{Z \to \infty} \left(1 + \frac{1}{Z}\right)^Z$$

"Equation (2) may therefore be rewritten:

$$\ln \left[\operatorname*{Lim}_{Z \to \infty} \left(1 + \frac{1}{Z}\right)^Z \right] + (\sin^2 x + \cos^2 x) = \sum_{n=0}^{\infty} \frac{\cosh y \sqrt{1 - \tanh^2 y}}{2^n} \qquad (3)$$

"At this point, it should be obvious that Eq. (3) is much clearer and more easily understood than Eq. (1). Other methods of a similar nature could be used to clarify Eq. (1) but these are easily discovered once the reader grasps the underlying principles."

Reprinted from NRL LABSTRACTS



applied science fiction

It isn't often a science-fiction writer sees his prophesies fulfilled. One way to make sure they are fulfilled is the do-it-yourself system.

WILL F. JENKINS-MURRAY LEINSTER

This is an inside report on a device that has sometimes been called a "Leinster Projector." The name is a mistake. The device isn't primarily a projector, though a projector is involved. It shouldn't be called a Leinster anything, because it's being made and marketed by a special corporation formed for the purpose by Sherman Fairchild, whose camera, instrument, and other empires are sufficiently well-known. It is a sound, sober business, and Murray Leinster is no longer active in it—and I feel much relieved. The device is properly called a Front Projection unit. It is made and sold by the Front Projection Corporation, and you can look it up in the New York telephone book if you like. I think it's interesting because if anything ever came out of science fiction for a practical purpose—contrived as science fiction, looking like science fiction, and working like a mad scientist's dream—this is it!

Here's the lowdown. There was once a television series called "Out There," which televised some of my science-fiction stories. I remember my "First Contact" and "The Seven Temporary Moons" in particular. The producer was John Haggott, who is one of the good eggs of the world. One day he invited me to watch a rehearsal of "First Contact" in preparation for broadcast. Afterward he asked me how I liked the production job. I made one criticism. The action of the play took place on a spaceship, and the ceiling of the set was so high as to be invisible—at least fifteen feet. The set didn't look cramped, as I thought it should. A spaceship would travel in empty space, but it wouldn't carry empty space inside it. There'd be plenty outside.

Haggott explained. Scenery cost money. Also it had to be made in one place, carried to another to be used, and then carried back to be scrapped. Besides—and even more importantly—a ceiling would play hob with the lighting of the set. He explained the last in detail, but it

Will Jenkins looks out of his spaceship lock onto the Moon's rugged surface—via Front Projection.

was the transportation angle that impressed me. I went away muttering to myself about machinery interfering with art like my stories.

Writing science fiction as I do, it seemed to me that in a science-oriented world such things ought to be better handled. When the real world caught up with science fiction, they'd manage TV problems more neatly. Productions, anyhow. In fact, they'd—

They'd what? It was no problem of mine, but it was mildly interesting. In the coming brave new world that science fiction anticipates, they wouldn't haul scenery around. They'd have something like—something like . . .

"Hm-m-m!"

Rear projection as a scenic device was familiar enough. You hang up a sheet of suitable translucent material. You project a picture on it from the rear. Then an actor stands in front of the projected picture and a camera photographs him and the projected picture together while he does his stuff. As a device it has some drawbacks. The studio has to be dark. Stray light will spoil everything. Light on the actors may splash on the translucent screen and wash out the picture. It takes an enormous amount of light to make a not-too-bright picture for the camera to re-photograph. This, that, and other things are wrong.

Plainly, I reflected, even improved rear-projected scenery wouldn't do for future TV productions. For example, one couldn't walk out of a door in a rear-projected set. An actor's silhouetted shadow on the screen beyond the door would be ridiculous. Rear projection's one advantage was that it did not require that scenery be built and hauled hither and yon. Ideal scenery for the day after tomorrow would be projected, no doubt, but not from the rear. Yet it couldn't be projected from the front. If a landscape were thrown on a screen with actors before it, the projection would fall on them, too. The actors would go about with stray bits of landscape on their shirt fronts.

This obviously meant that all projected scenery was impractical. But I was a science-fiction writer. (I still am.) A mere impossibility did not bother me. I considered the situation as if I were planning a story in terms of a device. For a story, a device needs only to seem plausible. Whether or not it would work doesn't matter. And this is how the whole thing started.

I said to myself that a future TV studio would have some sort of background screen which would show a projected picture which wouldn't show on a shirt front. Actors' shirts, faces, hands and clothing must reflect light, of

course, so they could be photographed, but it must be a sort of reflection that was different from the screen's—where the projection had to show to the camera, too. Specifically, the screen must reflect light as the actors mustn't. This is the sort of thing one has to improvise for fiction, but I wasn't even trying to plan a story. This was purely idle thought. If somebody had spoken to me I'd have stopped thinking to talk, and most likely the whole matter would have been dropped. But nobody did speak to me, so I went on casually meditating about the problems of TV for the faraway years to come.

There were three kinds of reflection, I remembered. There was metallic reflection, as by mirrors. There was diffuse reflection, as by a sheet of paper. There was selective reflection, as by colored bits of paint or cloth.

And then I remembered that there was also reflex reflection.

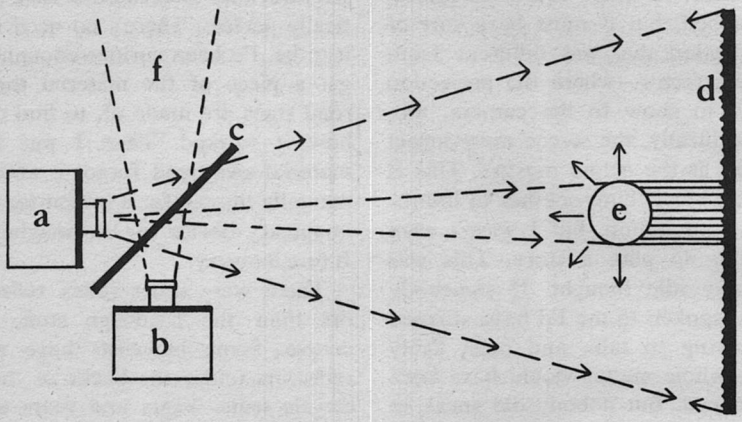
Long years before I'd gotten curious about those road signs which glow so brightly when your car's headlights strike them. They do not bounce the headlight beams in all directions. They return incident light to its source. They send it back to where it started from, almost regardless of the angle. In practice, enough of it strays to come back to you in the driver's seat, but that is because it isn't optically perfect. There's no need for it to be. I'd been curious enough to get a piece of the material those road signs are made of, to find out how it worked. Then I put the material away and forgot it until I mentally hunted for a screen for an imaginary device for an imaginary future industry.

There were other reflex reflectors than the road-sign stuff, of course. Some bicyclists have red reflectors under the backs of their bicycle seats. Years and years ago there was a series of "scientific detective" stories in *Cosmopolitan.* The detective was one Craig Kennedy, and he used a then-new scientific device to solve one new crime every month. In one such story he'd used a hollow mirror pyramid to return light directly to its source over a very long distance. And I'd seen—as who hasn't?—the remarkably bright reflection when a flashlight beam at night plays on grass beaded with dew.

Reflex reflection was standard stuff even if used only in detective stories and on road signs. It fitted into the problem I was casually considering. But it fitted so snugly that I remember saying astonishedly to myself:

"But this damned thing might really work!"

Such a possibility hadn't been in my mind before. Not at all. When



Schematic diagram of Front Projection unit. *a* is a camera, *b* a projector, and *c* a glass plate. (In production units it is half-silvered.) *d* is a screen of reflex material; *e* is an actor casting a shadow which does not show as the camera looks down the line of the projected light—technically along the optical axis of the projection. *f* is light thrown on the glass plate which is not reflected to the screen and is wasted or thrown away.

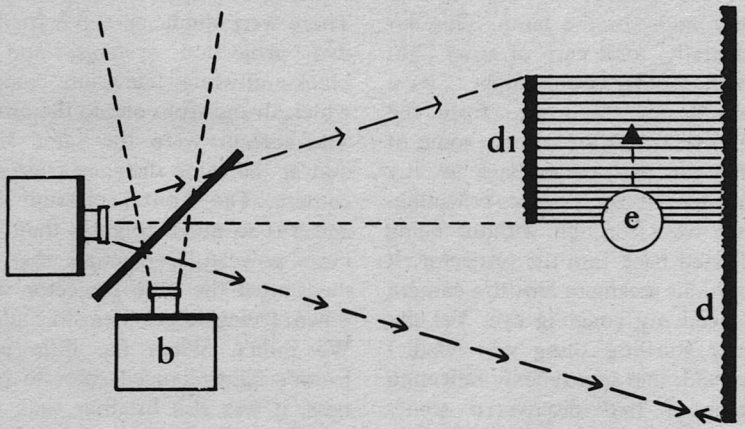
When the projector throws light on the glass plate, about half goes through and is wasted, and half goes to the screen. What light falls on the actor *e* is reflected diffusely in all directions. What hits the screen returns to the mirror. There some is reflected back into the projector and some goes through to the camera. Because it is concentrated instead of scattered it is very bright.

I got home I dug out the old piece of road-sign stuff and set it up against the side wall of the living room. I threw a picture on it from a slide projector. It was no good. Outside of a circle perhaps six inches across, it couldn't be seen at all. But the nearer my eye came to the projector lens, the brighter it appeared. I wanted to see how bright it could become. So I turned the projector to throw its picture on another wall entirely—an end wall, and not at the reflex stuff. Then I took the glass from a framed photograph and set it before the lens of the projector at forty-five degrees. It reflected part of the projected light to the road-sign material, though part went

through and was wasted. And then I looked through the glass at the road-sign screen.

It nearly blinded me. It was almost equal to the dazzle one would get by staring into the projector lens at close range.

It was the reflex-reflection screen, of course. The road-sign stuff. That screen didn't scatter the light that fell on it. Light started out from the projector as a very bright beam, perhaps an inch in diameter. It spread out to a six-foot disk on the wall. It hit the road-sign material and was reflected again—but peculiarly. It was *not* reflected at an angle equal to but opposite the angle of its incidence on the screen. It was reflected along a line *parallel* to the angle of its incidence, and traveling the other way back to the projector. So my projection beam expanded on its way to the screen—and naturally became less bright on the way—and contracted on its way back to the projector—and naturally grew brighter in the process. The elements of the screen weren't optically perfect and some light scattered, but not too much. An



Projected entrance and exit. d and *dI* are screens of reflex material. The image from the projector *b* goes to both screens, with the edge of the one nearest the camera lined up with the edge of an object behind which the actor moves. As shown, the actor (*e*) is moving off-stage behind the edge of a projected door frame, or wall-end, or what have you.

inch-across beam going out might be returned to a three-inch circle. A very long throw might let the returned light spread out a little more—maybe six inches. But it was all returned to a small space instead of being scattered to the floor and walls and ceiling of my living room.

What I had, then, was a screen that reflected like a concave mirror, except that it was focused everywhere at once. Every light source sending light to the screen got it back. Light from a window or a room lamp didn't get reflected into the camera. It went back to the window or the lamp. This, incidentally, took care of stray light which otherwise might have washed out the image from the projector. And, of course, some of the light that came back to my forty-five-degree glass-reflecting-plate went through without being reflected back into the projector. It would hit a camera lens if a camera replaced my goggling eye. Yet the really startling thing was what I just said; that in a reflexly reflecting screen, I had discovered something that acted exactly like a concave mirror focused on every spot from which light could reach it.

Apparently nobody had noticed this property of reflexly reflecting material before.

In a sense I had the whole front-projection system right there. The image was grainy because the road-sign stuff was grainy. But that could be improved. (I had no idea how much it could be improved.) There were other items. At least three difficulties I might have anticipated didn't turn up at all. Not even in this first living-room-wall road-sign-material setup.

For the first, the quantity of light returned was fabulous. Later on, in a demonstration, one of my amateur units was compared with a standard over-two-thousand-watt rear-projection unit. I had a three-hundred-fifty-watt slide projector. There were duplicate slides for the two projection systems, and a black-and-white television camera which swung from one to the other. The screens were the same size, and at the same distance from the camera. The front projection image was so much brighter than the more powerful projector's that we rheostatted the little projector way down, trying to get them to match. We didn't. When the little projector's light changed color to redness, it was still brighter than the rear-projection image.

But that came later. The fact of extreme brightness was a lucky break. So in my living room I checked the obvious other questions. For example, how about the actors? Would this projection

show on them? I didn't think it should.

An actor would reflect light diffusely—in all directions. Put a light on him and increase the distance, and his image should diminish in brightness as the inverse square of the distance. Double the distance and he'd be only a fourth as bright. Triple it and he'd make an image only a ninth as bright. More, the light that fell on him from the projector should diminish as the projection beam expanded in size, and then the amount it returned should decrease according to the inverse-square law, so if I put a diffusely reflecting object like a man in a white shirt before the screen, he should return almost none of the projection to my eye peering from its highly specific position. This was the imaginary thing I'd first conceived of and then tried mildly to produce.

It was a second break. I actually put a sheet of white paper over part of the screen and cut off all light but the projector. I looked. The returned, concentrated light from the screen was bright enough to hurt my eyes when they were where the camera would eventually go. The relatively faint, expanded image, where it fell on the white paper and was reflected on the walls and floor and ceiling, was stretched so thin that the paper looked black.

I found, of course, that there was a particular spot where the returned light was brightest. Then I hunted for the last answer to the last immediate question. How about shadows? If I had an actor in the projection beam, would he cast a shadow visible to my eye where a camera ought to be?

This was the third break. It couldn't help but be what I wanted, but it was pleasant to see it, at that.

While I puttered I'd been theorizing, too. It seemed to me that looking through the reflecting glass plate should be very much like looking through a candle flame. You can't look through a flame and see the shadows the flame produces. The objects that make shadows from the flame, mask them from the flame's light. So if I looked through the glass that reflected light to the reflex screen, objects in the projection beam should mask their shadows with respect to the light source that made them.

It turned out to be a little bit tricky—just a little bit. It was possible to look through one side of the reflecting plate and see a line of shadow to one or the other side of the object I used as an actor. But it was also possible to find the spot where the returned light was brightest. And when one looked from that spot the masking was perfect. No shadow showed.

So this first test told me that

what I'd started out imagining had become real. There were things that had to be made better, of course. The road-sign reflecting material was grainy to the eye and would be grainy to the camera. (I got better material later, and the screen now used in Front Projection units is very smooth stuff indeed.) But in substance I did have a Front Projection unit. It only needed research and development, better materials and patent protection, experience in manufacturing and merchandising, considerable capital, a few other things to make it really valuable. But I didn't realize all those needs at the time.

Next time I saw John Haggott I started to tell him about it. I drew diagrams until he said sternly:

"Don't tell me any more until you've got a patent application in, at least!"

Haggott, as I said, is a very good egg. I mooned around, reluctant to invest cash in something I'd dreamed up myself, for fun. But I was tempted. Then Ted Thomas —who writes pretty competent science fiction himself—drew up patent applications for me. He is another of the good eggs of the world and, besides, I couldn't have had a better man for the job. When the applications were in I made a portable unit and showed it to John Haggott. My demonstration unit was made of a cigar box, a sheet of glass—the cigar-box held it upright—a sheet of black carbon paper, a slide projector, and a piece of road-sign material. I demonstrated it to him in his office. I was quite proud. I put the cigar box on his desk, placed the projector, put the carbon paper to absorb the light that went unreflected through the glass and had to be got rid of, and hung my screen on a chair back. Then I turned on the projector and had him look through the glass at the screen.

It worked. In a normally lighted office, it worked. I held out my hands before the screen and wiggled my fingers to show that no shadows appeared. I spread out a white handkerchief and proved that the image was invisible on it. I did other tricks. I thought it was a very nice demonstration. Apparently Haggott did, too. He took charge of the contrivance to show the bigger shots of that TV organization.

I think they'd have bought the idea if I'd furnished a neatly finished, professional-looking unit for them to play with. But frankly,

The odd shadowing in this shot was deliberate—since it was made to show what Front Projection can do. It'd be somewhat difficult to get something like this on location!

this improvised gadget looked like it had been designed by Rube Goldberg. Things I make do tend to look like that. And that particular company didn't want to develop anything. They might have bought something if they could simply set it up and use it. What I had, needed more work on it. Much more. I didn't see how important that was. I do, now.

There seems to be a natural law that neither Parkinson nor Finagle has formulated to date. It is roughly that anything which can be predicted by reason will never happen in fact. My Front Projection invention, as such, was pretty good. It was entirely novel and was quite practical, as has since been demonstrated. It should have been grabbed at once, the patents should have slipped through without trouble, and somebody should have had an interesting time developing it into a perfectly sound commercial proposition. This has happened since, too. But then everything went wrong. Even the Patent Office cited interferences of my device with the claims of other and—it seemed to me—quite unrelated patents.

Somebody had patented the idea of a huge concave mirror—feet or yards across—with a reflecting plate and a camera at its exact focal point. He hadn't tried it full-scale because a mirror—say—twenty feet in diameter and properly ground would cost at least some hundreds of thousands, and he mentioned that it would save on the electric-light bills of a movie studio. But it looked to the patent examiner as if I merely substituted roadsign material for a concave mirror. Substituting materials, only, seems not to be patentable. There was somebody who had patented a device for taking movies and other pictures by certain wavelengths of colored light alone. I've forgotten how I was supposed to be infringing his device. Somebody else had patented the use of reflex elements on the back of set-size plate-glass sheets. Still another one had mounted a projector lens immediately above the camera lens. His pictures had a tiny black shadow line at the bottom of every actor's arms and body. There were other discouraging rulings.

With the patents still pending—a rejection isn't necessarily final—a possible large user of front projection units offered me two hundred dollars for an unlimited license. He said I'd get a hundred thousand dollars' worth of advertising from his use of my device. But I didn't know any place where I could spend a hundred thousand dollars' worth of advertising. A network took a year's experimental license, renewed it, and then


175 cc BOBCAT
TRAIL MODEL
SPORTCYCLE

dropped it. As I heard privately, they'd arranged to use it in a special top-drawer two-part production with special scenic effects. But the director insisted on an opening with a dolly-in, and that couldn't be done—not then. It can now. Other directors firmly insisted on seeing what somebody else had done with it before they'd risk using it. They wouldn't try anything nobody else had been successful with before. Then, after the patents were issued somebody began to manufacture units in apparent ignorance that it wasn't customary. Informed of the rules, they didn't sell any. An equipment company said their engineers were tied up for a year, but then bring it back.

There was one deal that almost went through. A contract had been drawn up for the use of my patents when they were issued. It wasn't yet signed. Then my customer had a bright idea. Since at that time my patents weren't certain, maybe I wouldn't get them. So when an official of a company which could supply parts of the units called on him, my customer made a proposition. If his visitor's company would undertake to defend any suit I might bring, he'd start to manufacture and buy all possible items from his visitor. If I didn't get my patents, that would be that. If I did—

The visitor was pleasantly interested, but he asked to see a copy of my patent applications. If his legal department didn't think I'd get the patents, his firm would stand back of my customer while he stole my device. I think this is called the high ethical standard of American business. But I got word. When my customer asked to have a copy of my applications back, I declined. Fortunately he hadn't had them copied when he had them before. So the deal fell through. My customer wouldn't risk stealing the invention without assurance of legal protection, nor would he sign a contract for something he might be able to steal.

There were other, similar events. I got fed up. I wanted out of the business, but not by dealing with somebody I'd have to watch. It seemed that I had something people wanted to cheat me out of, but not to buy.

And then the Patent Office officially rejected all my patent claims and I went to Washington with two projectors and a piece of road-sign material, to argue with the patent examiner.

It went off surprisingly well. The examiner had ruled that using reflex material as a screen was only a substitution of one material for another. I showed him that a concave mirror required its camera to be at one camera position and distance, while in my gadget a camera

could shoot from any distance or angle. Further, two cameras could work on two pictures on the screen at the same time. This was new. (Actually, three or more can be used.) It had been ruled that another patent had included reflex elements on the back of sheets of glass. I demonstrated that reflex elements behind glass couldn't dispose of stray light—"ambient" light—or avoid "ghosts" on the polished glass surface. The material I used could do both those things. It was a matter of proving that my gadget did specifically different things in each case.

I got my patents. Then I got letters from people with impressive letterheads, saying that they were much interested in my invention—here the patent numbers were written into the form letter with a pen—and they would like to act as my agents in disposing of them. They would ask a small fee to begin with but they had a highly probable purchaser already. And the letter ended "DON'T COME TO SEE US! WRITE!" And I reflected that they were undoubtedly branches of those business enterprises which advertise that song poems are wanted, or what is your name because you may be a lost heir with a fortune waiting for you.

So time passed and passed and passed. Now and then somebody expressed interest. But I was busy. I had—and still have—a profession of my own. I am not a technician in optics, photography, or television. I'd made something I thought was good, and that people wanted to steal, but I didn't have either the facilities, or the competence, to do the development job the thing really needed.

Then the deal with Fairchild turned up and went through. Now there has been a good research-and-development job done. Some of the stuff is over my head. For example, Front Projection units coming off the assembly line now have circularly polarizing filters to make certain filler lights practical. I'm not sure I understand the theory, but I do see the results. They're good. There's a strobe-light system that I couldn't have contrived and certainly couldn't have built. The thing is properly developed and really practical now. It would have been beyond me. But at least I started the business!

Things that were only theories have worked out as facts. Some of them . . . Now it isn't always necessary to take a movie company on location. Most outdoor stuff can be done indoors. The gadget returns so incredible an amount of light to the camera—or cameras—that screens twenty-five feet by forty are being used right now as a matter of course. I don't mean to try to put hard-sell stuff into this report, but a

lot of locations can be put on transparencies and shot in a studio, with Front Projection. Even some locations you can't send a shooting company to are available. The pictures with this report are evidence.

But nevertheless there are people who curse me on Front Projection account. There was a time when shapely models and photographers were sent down to the tropics to make pictures of shapely models in tropic settings. Rear projection simply doesn't make pictures of the required high quality. Front Projection does. So nowadays some agencies send a photographer down all by himself, and the background shots he makes are combined with the models back home. It saves money—a lot of money—but it isn't as much fun.

I didn't intend any of this when I started out. It may be that since I've described Front Projection in such detail, it may not seem extraordinary. But it is a science-fiction gadget. It throws invisible images on a screen where you can't see them, and also on actors and actresses where likewise they don't show, though the pictures are in quite ordinary light—black-and-white or color. Yet a still, or movie, or television camera can receive and record them, invisible though they may be. The pictures with this report were made with this device. For a still picture, a Front Projection unit can operate without a single moving part but the camera shutter. When taking color the lens is frequently stepped down to F 28. (Yes. Twenty-eight.) Front Projection works in normally lighted studios because stray light is hardly a problem. For movies and television Front Projection units pan and dissolve and zoom, and dolly and fade and lap-dissolve, and otherwise juggle things around inside themselves. At least three cameras can use the same projection screen at the same time, taking three pictures simultaneously, still or movie or TV, without confusion, whether they are of different backgrounds altogether or different angles of one.

This, I submit, is science fiction made fact. And still I haven't mentioned some of the really far-out facts. For example, I said at the beginning that an actor couldn't walk out of a rear-projection projected doorway. He'd still show as a silhouette on the set. But a Front Projection unit can use two screens, overlapping each other and with one closer to the camera than the other. So long as both are within the depth of focus of the projector, the camera sees no joint. And one screen can be lined up with the image of a door's frame or the end of a wall, or a tree trunk. And when an actor walks behind the

screen on which that door, or wall, or tree trunk is projected, he walks offstage. He goes out the door, or around the end of the wall, or behind the tree. Or he can climb out of a projected window if the projection is matched to a suitable piece of reflex screen. And it looks right. When it comes to movies—the making of movies by rear projection is at least complicated, besides being less than perfect in its results. But a simple, reliable, small mechanical connection of the projector and camera, for positive synchrony of projector and camera —this in a Front Projection setup makes movie-making duck soup.

So there you are. I enjoyed puttering this thing into existence, even if the current production models make me feel less smart because I couldn't have built them. I've done a lot of puttering, but this is the only item I sweated over. But there are rewards. I like to think that there are units in use right now in such unexpected places as the Pentagon, and at Polaroid headquarters, and the *Saturday Evening Post,* and *Life* and *Glamour,* and that they're used regularly by large furniture manufacturers and mail-order catalog publishers, and that there is one functioning admirably behind the Iron Curtain. And there are local TV stations putting on local programs with 35 mm. slides furnishing their backgrounds—and they don't haul scenery around at all.

It's a nice, complacent feeling. I even feel slightly noble. There's certainly one portrait photographer who has reason to be grateful to me. He has a Front Projection unit and a dozen or so sample pictures of brides and bridal parties. The pictures were made with Front Projection and have full, really color-saturated backgrounds of magnificent church interiors. This photographer says he used to sell four out of ten possible customers on a set of wedding pictures. Now he sells eight out of ten.

He spreads out his sample pictures and excuses himself for a moment or two. His prospects look at the samples. He says that when he comes back they are already arguing about which church they'll decide to have the wedding photographed in, and they don't ask about the cost at all.

This is a triumph. I'm really rather touched. Consider: there's not only an invention involved, but a sizable corporation with stenographers and bookkeepers and management personnel and a public-relations department and an assembly line, and all to make and sell Front Projection!

And isn't it wonderful that I've helped a portrait photographer to sell more wedding pictures than he used to? ■

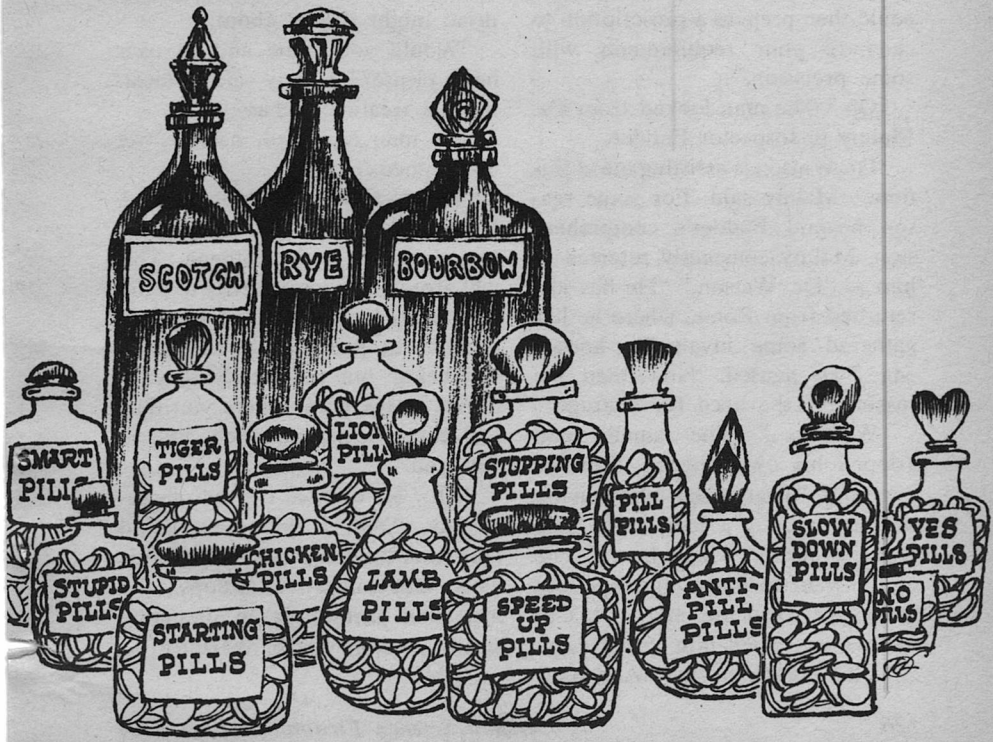
THE CURE-ALL

merchant

There are times when it can be extremely difficult to define the concept "fraud." If you go to a man to be cured, and he charges you for a treatment he doesn't give you—but does cure you!—have you been defrauded?

JACK WODHAMS

Illustrated by Kelly Freas



The slight man took back his blue reactive-range card. "I need something to . . . to give me courage," he said.

"I see." Dr. Malmy studied him thoughtfully. "Well, now, I can do something for you, but much depends on the time. The effects will not be permanent, you see, or of long duration."

"It doesn't have to be," the man said. "If you could give me something now to . . . to last about an hour. Could you do that?"

"Hm-m-m. Why, yes. Ah . . . it would be diagnostically helpful if you would tell me something of the situation that you intend to face. I could then prepare a prescription to cater to your requirements with some precision."

"Oh." The man looked from Dr. Malmy to Inspector Fudder.

"Dr. Watson is assisting me at this time," Malmy said. For some reason beyond Fudder's comprehension, Malmy constantly referred to him as "Dr. Watson." "He has just returned from Rome, where he has gathered some invaluable knowledge." He paused. "Now, then, the reason for the need for courage?"

"Well . . ." The small man gripped his own fingers. Then he burst out, "There's this fellow living with us, a . . . a lodger my wife took in, and . . . and he . . . he . . . I want to throw him out. But he's bigger than me, and . . . and when I try to tell him to leave, he . . . he laughs at me. And . . . and there's nothing I can do. Because . . . because I'm afraid. I . . . I'd like to stand up to him, but . . . but he'd kill me . . ."

"Ah." Malmy nodded. "I understand. Yes, indeed. I can certainly do something for you. You are sure that he will be home this evening?"

"Yes. If . . . if I could have something, I'd . . . I'd go straight home and tackle him."

"Good." Malmy moved over to his impressive pharmaceutical cabinet. Drugs and concoctions of every description crowded the upper shelves, and could be seen piled high inside the open cupboards. It was a cocktail bar such as a hypochondriac might dream about.

"Would you come and sit over here, please?" Malmy said, indicating his treatment chair.

The man complied, nervous yet determined.

"Right. Courage," Malmy said. He began to select bottles. "First, two drops of resisobiothene. This will give you an insensitivity to pain. Plus one drop, I think, of the JBH tranker, to give you a feeling of well-being, but not steadying your nerves to the point where you may feel careless. Just a touch, yes, to key you.

"Ah." He quizzed the man measuringly. "Yes, I think you could take it. A little aggressolin, which is what they supply to troops who may find themselves in desperate straits. Do you agree, Watson?"

"Uh?"

"I thought you would. Now an adrenalin control, and a bowel-action inhibitor, and a little tesi-throbital, which should help you to articulate freely under stress. And some, ah, yes, and . . . Hm-m-m."

Malmy added some clear fluid to act as a carrying agent, and mixed the ingredients thoroughly. He then very carefully filled a hypodermic with the resultant blackly-red liquid. "Roll back your sleeve," he commanded. "I will give you your speedeal wound-shot separately."

Malmy dabbed with some cotton wool at an area of exposed forearm, stuck the needle in, ignored his client's twitch, and gradually emptied the syringe.

Next Malmy administered the green-tinted speedeal.

The man was breathing faster. He reached to roll down his sleeve. "Is that it?"

Malmy lifted a delaying palm. He raised his eyebrows at Fudder. "I think a trifle of muscle stimulant may be helpful in this case. What do you think, Watson?"

"Well . . ."

"Yes. Speed his reflexes. He will be able to react faster, and his muscular capacity will be enhanced from two- to three-times. Yes. For a short period this may be very useful. You understand," he said to the man, "that after the episode you may feel rather tired. But this will not be an unpleasant sensation."

Malmy prepared the third injection, holding it up to the light. It was a rich, clear fluid that glinted gold.

The third dose emptied into a vein, Malmy dropped the needle into a sterilizing bowl and looked at his watch. "The treatment should reach its effective peak in about thirty minutes. This peak will be sustained for a further thirty minutes, and, thereafter, there will be a slow decline back to normal over the next hour."

"Oh." The man hurriedly buttoned his sleeve and stood up to get back into his jacket. "Thank you, Doctor. Thank you very much."

He had already taken a few paces towards his way out, when Malmy halted him with a mild request. "Would you mind settling now? In a case where I use such expensive drugs . . ."

"Um-m-m? Oh. Yes. Yes, of course."

The man took out his checkbook, thumbed his pen.

"Fifty dollars," Malmy said.

The pen flew. The man tore the slip away impatiently and handed it over.

"Thank you," Malmy said.

"No, no. Thank *you*," the man replied. "You will excuse me? After all, I haven't much time, have I?" Apologizing for his haste, and with a new, eager gleam in his eye, he backed and quickly took his departure.

"Come, Watson," Malmy said, pocketing the check, "let us out the

back way, to follow up and observe the culmination of our efforts."

"What? Have you no other clients due?"

"Perhaps, but none of importance. My interest in such a case as this transcends the mundane treadmill demands of those whose needs are less spectacular . . ."

"We're not far behind him, you see. Note that he hasn't put his slider away, but dropped it right by the front door. He should just about be on fire now." Malmy leaned forward to peer through the windscreen. "Looks pleasant in the twilight, doesn't it? Ah! There're the street lights. Ah, yes. Quite an attractive house." He began to whistle softly.

After about three minutes, an upper window of the house flew open and, in short order, clothing, shoes, brushes, toilet articles and miscellaneous goods started to rain out onto the lawn below. Two suitcases were hurled out at the last.

It did not take a keen ear to detect the sound of law being laid down.

After a brief delay, the front door slid back, and out came a large man, walking mostly backwards, being shoved and threatened by a tight, grim, fierce-faced terrier, who was Malmy's recent client. The smaller man pushed the bigger man's chest and kept him moving. The free hand gestured dramatically and pointedly.

The pair reached the disorder on the lawn, and the bigger man stumbled on a suitcase. He halted then with some truculence, and growled a gruff query.

Whatever he said, it seemed to infuriate the other, for the smaller man rose onto his toes and delivered a beautiful right cross to the big man's eye.

The big man staggered and fell into a heap of shirts. He scrambled round on his hands and knees, raising one defensive arm and now complaining.

The small man kicked a suitcase at him contemptuously, following this by booting pants and other articles of dress in the same general direction.

The big man mumbled to himself and gathered his goods together as quickly as he was able, flinching now and then as a flying foot came carelessly close. He stuffed his bags, closed one, failed to close the other, and tucked it under his arm to hold it together. He got up off his knees and backed away, sullen and resentful under an unceasing vituperative harangue that seemed but a whisper-touch away from exploding into alarming personal violence.

Malmy watched the bigger man, hurt and dazed by the rapid and virulent attack, slouch away. He smiled with satisfaction.

The little man, upon the footpath, dusted his hands in classic fashion, then braced himself and turned. With new purpose, he re-

traced his steps to his front door, where his astonished wife gaped in incredulity.

Contented by what he had seen, Malmy switched on his slider; the machine rose and sped away down the avenue.

"Well, what did you think of that, Watson?"

"Remarkable," Fudder said, with some admiration. "It seems that your selection of ingredients could not have been more precise. A perfect gauging of dosage, I should say."

"So would I. Two modest injections of sweetened vodka, and one of my best-quality scotch. Served with all the trimmings and we have one satisfied customer."

"Uh?" Fudder looked blank for a while. "Do you mean that you didn't really give him those drugs at all?"

"My dear Watson," Malmy said, swinging onto the second-level eastbound, "he didn't need drugs. What he needed was confidence. Certainly I could have given him genuine boosters, but what a waste! His own body is capable of producing all the drugs he requires for a situation like that. No. He wanted help. I gave him help.

"It takes roughly half-an-hour to get from my consulting-rooms to his home. I knew this from his address." He mused. "Nice time to work up a fever, thirty minutes. When the effects wear off, he will revert quite naturally to his ordinary restrained self, though he will be uplifted for some while by the events of this evening."

Malmy took the right-hand ramp to the third-level north. "He's not the type to become drug-dependent," he opined. "I'll not see him again until some further crisis may place him once more in need of my services."

"But . . . but you didn't give him anything!" Fudder protested. "You charged a fat fee, yet he did everything for himself!"

"You're forgetting the alcohol," Malmy reminded, "and if my fee had been a mere ten dollars, he immediately would have lost faith in the remedy. And faith is very important. Faith is what I dispense more than anything else.

"You see, Watson, the vast majority of people lack faith in themselves. If people did not lack faith in themselves, there would be far more individualists and far fewer leaders. Leaders, indeed, would find it hard to exist without the common intrinsically-personal self-doubt that bedevils the minds of most. He is better qualified than I am; he is more knowledgeable than I am. This is how persons view people they meet in every walk of life, from the holoscope repairman, right up to the President himself. And if they oppose the President's views, they transfer their faith to the challenger."

Malmy took the long, long curve to the left and down, that took

them to the first level and pointed them east again.

"You're trying to justify yourself," Fudder said sternly, "but I cannot see any necessity for the mumbo jumbo you went through. You could have instructed the man more plainly. As it is, you have perpetrated what is nothing more than . . . than a . . . a fraud!"

"Come, come, Watson, be reasonable. My treatment worked, and surely success should be the criterion? A lesser Dispenser may have filled him with rare and costly extracts, and achieved a poorer result. And certainly more noticeable aftereffects."

"Maybe it did work," Fudder persisted, "but, well, I'm sorry to have to say this, Dr. Malmy, but, well, such methods do not accord with current practice. Such trickery is nothing but . . . but charlatanism. There!"

They began to scoot up the extensive climb to the sixth-level residence and workshop of Dr. Malmy.

"What quaint old-fashioned ideas you have, Watson. You place a price upon commodity and regard the abstract as valueless. Yet the abstract is reality, while the commodity is a transient irrecoverable. I dispense faith, not pills. If the people who take the pills I give them become cured, it is not because they believe that the pills will cure them, but that they believe that *I* believe that the pills will cure them. They do, in effect, lean upon *my* faith. Fortunately, I am one of those few people who have faith in themselves. It can be sensed, you know. It is like a psychic aura."

"Hm-m-m." Fudder sniffed at this conceit. "It's more like a cultivated bedside manner that you are deliberately exploiting."

"I can see that you harbor a number of ancient prejudices, Watson. Not to worry, your blindness stems from an ignorance of the unsupported power of the human mind. Ah! We have a visitor waiting, I see. Oh, yes. Dear, dear. The recently wedded Mrs. Laytely. She did make an appointment earlier. How much behind am I? Oh, barely fifteen minutes."

While he rambled on, he parked his vehicle in his side shelter, climbed out, and started for the front of the building.

"Come, Watson, and observe, and curb your cynicism to note, not the dubiety of my modus operandi, but the true and comforting assuagement and relief of qualms."

They rounded the corner.

"Ah, Mrs. Laytely! It is Mrs. Laytely, isn't it?" Malmy cried with disconcerting enthusiasm. He took the startled lady by the arm. "Why, you are even lovelier than your voice. The voice, an intriguing instrument."

Malmy placed his hand upon a door panel, and the obstruction slid back. "I am, of course, Dr. Malmy,"

he said, inviting her gently to step inside. "I feared that you would not wait, and hastened as best I was able. Was called away to a dying man. Emergency. One of those things. Reached him in time, luckily. He'll take a week to recuperate, but at least he is now out of danger."

Malmy guided her into his elegant forward room, and offered her a chair that was cunningly deep and difficult not to relax in. "I do hope that we didn't keep you waiting long? It *would* be a night that my housekeeper has chosen to be away. Am I forgiven?"

She smiled, a little bewildered but not unmindful of the gallantry.

"And this," Malmy said with a flourish, "is my good friend, Dr. Watson, the eminent gynecologist, who has but recently returned from Vienna. Please feel free to speak without restraint, for I am sure that he wishes, as I do, to assist you in any manner possible."

"Thank you," she said. The chair was getting hold of her, the artful angle urging her spine to bend.

"Ah, yes. Your card. May I have . . . ?"

"Oh, yes." She tendered her card.

"Hm-m-m. Uhuh. Uhuh, uhuh, uhuh. No complications here." He handed the card back. "Thank you.

"Now," Malmy coughed, "I understand that your concern is a domestic matter?"

She blushed lightly, and sagged completely. "Yes. I . . . I don't know how to say it. It's . . . It's rather embarrassing."

"Quite so, quite so. Ah . . . it has to do with your relationship with your husband?"

"Yes."

"The fault is his, do you think?" Malmy asked delicately.

"Oh, no. No, it's I. You . . . you see, I'm . . . I'm frigid."

"Ah. Well, that I find hard to believe. Still . . . Have you taken tranquilizers, or other forms of medication?"

"Well no. I thought it better to seek professional advice first."

"Very wise, very wise. Yes. You desire something, perhaps, that will release your inhibitions, yes?

"Frigidity, as you know, is caused partially by fear, and partially by irrational and unfounded conceptions of morality. But it takes a young wife some time to realize that those things in her partner and within herself that she may recoil from as being disgusting, are not only permissible on the marriage couch, but are, in fact, integral, accepted and positively desirable. Shock is something that you must deny and, if you know reluctance, you must recognize that you are only retreating behind a shield in the face of unfamiliarity.

"Now then," he said briskly. "I think that a small measure of dreemeezy may help unfreeze some of the withholding forces. Don't you agree, Watson?"

"Uh?"

"Yes, you have a point there. It *is* rather mild. Hm-m-m."

Malmy glanced sideways at Mrs. Laytely. "You would like something stronger, surer? Oh, I don't know."

Malmy paced the room a couple of times. "Mrs. Laytely, I am a Dispensing Doctor. I'll . . . But no, perhaps not. Not unless the matter is urgent. *Is* the matter urgent and essential?"

"Oh, yes," she said.

"Hm-m-m. Very well." He held out a lifting hand. "If you will come over here . . ."

He led her to his formidable workbench. He rubbed his chin. He carefully selected a small phial, held it in his hand and contemplated.

"Hm-m-m. This is an odd drug. HMNO5-inclotzic. It's what we call a helper-agent. That is, you may think that it is not affecting you, but as you go forward breaking the bonds that hold you one by one, you will find that it becomes easier and easier. The more you will to overcome, the more effective you will find this drug to be." Malmy put a finger and thumb on his lips. "I'm not really sure . . ."

"Doctor, please," she said. "I . . . I do so want to please my husband."

"Ah." Malmy nodded, giving in. "Husbands. Demanding creatures. It would serve them right if their wives demanded all they could give." Malmy chose to stress this remark. "Yes, it would serve him right if his wife took the initiative. Attack is very often the best method of defense."

Malmy selected a needle. "Roll up your sleeve, please."

He loaded the hypodermic. "Right." A squirt to expel air, then pricked into the arm. He exhausted the tube slowly.

"There you are, Mrs. Laytely." He coughed again. "Ah, perhaps I should have warned you. This drug has a considerable residual effect. Now and again in, ah . . . the weeks to come, you will get noticeable, ah . . . promptings. With your co-operation, you will find the benefits, ah . . . unimpaired."

"Oh."

"That is all. Remember everything I have told you."

"Oh. Oh, yes, I will." Her face flushed. "Er . . . can I pay you now? You see, if you send a bill to my . . ."

"Of course, of course," Malmy said. "I quite understand." Deciding that the diamonds in her ears were real, he stuck to his standard fee. "Fifty dollars, please."

She paid him without demur.

Malmy showed her to the door; gave her a last-minute free injunction: "Take it easy on him, won't you?"

Malmy returned to find Fudder holding the used phial to the light. "And what was it that you gave *her?*" Fudder challenged.

"Dutch gin," Malmy said, unperturbed. "Do her the world of good. Amateurs will persist in leaping to exaggerated conclusions from seized erroneous hints that promote the most morbid of diagnoses. She is a perfectly normal, healthy girl."

"But she wanted a mild aphrodisiac, what was wrong with giving her one?" Fudder exclaimed.

"She didn't need it. She'll do marvelously well without. With luck, my next customer will be Mr. Laytely seeking pep pills."

Fudder tossed the container onto the bench. "You have the real stuff here," he said, waving his hand. "Why don't you use it? People come to you for the drugs that you are qualified and licensed to dispense, and yet you give them placebos. There's no need for it."

"I wouldn't say, Watson," Malmy replied. "Apart from being more profitable, my methods are not without merit. Drugs distort the capacity of the mind; affect the body and, therefore, the mind. I do the same thing. I endeavor to shape the mind a little, establish an approach, and supply a talisman. It pleases me to bypass drugs and achieve results aided by nothing more than the faith I can engender."

"Faith! But the faith is false, man! They have faith in drugs that they have not taken! They have faith in nothing!"

"Yes. Strange, that is, isn't it? And most times it works, just as if they had taken the drug." He wagged his head. "Funny business, medicine. Ah, somebody calls."

The trilling continued as he crossed the room, the clear notes tinkling attractively as though from an accelerated music box.

Malmy picked up the receiver. He listened and spoke, soothingly.

Malmy soon replaced the receiver, and bustled once more to the exit. "Come along, Watson. An outside call from a regular, not too far away."

He picked up his bag in the hall and, with Fudder first on his heels and then at his side, he left the house and marched along the pavement.

"A woman subject to neurotic lapses," Malmy said. "She thinks that nobody loves her. Calls me in now and again to make sure that at least *I* care."

"What have you got her on, rositinte capsules?"

"Good heavens, no! She's not wildly unhappy. The trouble with rositinte is that users don't know who or what they are after a while. No, I understand her. Assure her every so often that she is sane, a normal wanted human being, and that with my help she can lick her troubles."

"Your help," Fudder derided. "You place much importance upon your personal help."

"Yes, indeed. Very important. An ability to give and comprehend." Malmy stopped. "I sometimes think that this sensitivity should be re-

garded in the category of ESP. I mean, do you know what people feel like, Watson? You, for example. There is reproof and insensibility in your every line. I can feel your collar pinching my neck, and I know just why you stand and walk as you do. Your whole mentality is reflected in your every movement, and I can feel the silly straightness of your hat as though it were upon my own head.

"I can understand you, right down to your aching feet, but you, alas, can never understand me." For a moment Malmy was uncharacteristically sad. Then, "Come, Watson, we are here. We take the elevator to the top. Mrs. Paddigrew will be waiting . . ."

"It's this trembling, you see," Mrs. Paddigrew said, holding out a shaking arm by way of demonstration. "Started two days ago, and it's getting worse, I think."

"I expected this," Malmy nodded, soberly undismayed by the vibrating condition. "Fact is I've expected your call for well over a week. Thought maybe I was wrong, even, when I didn't hear from you."

"Really? You know what it is then?"

"Oh, yes. It's not serious if it's treated properly. You must have a strong constitution not to have been troubled before this. Oh, by the way, you know the famous Dr. Watson? Visiting me again. Just back from Stockholm and happened to stop by. He was interested in the details of your case, and so I brought him along. I hope you don't mind?"

"Oh, no, not at all," Mrs. Paddigrew said, stopping her shaking arm long enough to offer a hand to Fudder to let him shake it for her. The scowling Fudder obliged briefly.

"Now then," Malmy said. "You remember I took a small blood sample for analysis the last time I was here? Yes. Well, it was as I suspected. You're Rhesus B negative, with just a slight excess of blobulin. It is this excess blobulin that is causing your trouble."

"Oh, dear. Is it very bad?"

"Oh, no. Quite the contrary, in fact. Very few people have blobulin in their blood at all, did you know that? Quite rare. Recent research indicates that it is very probably a considerable aid to longevity. How old was your mother when she died?"

"Fifty-eight."

"Father?"

"Sixty-three."

Malmy frowned. "One of your grandparents, then, must have lived to a ripe old age?"

"Oh, yes. Grandfather Lou lived to be ninety-two."

Malmy's face cleared. "There you are then. That's who you get it from. It often skips a generation." Malmy frowned again. "Trouble is, excess blobulin gives exactly the symptoms that you complain of. I have been worried about this, which is why I took the blood sample last

time. Noticed you had developed a slight twitch. That's one drawback with mestemerone, it tends to have a slow-but-steady blobulin-cumulative effect on those few people who do have blobulin in their blood."

"It won't make any difference if I ever need a transfusion, will it?" she asked, suddenly worried.

"Oh, no, none at all. It's a beneficial ingredient that your body would naturally add to new blood in a few days."

"I'm glad of that," she said. "But you say I've got excess? What am I going to do about that?"

"The trembling is your answer," Malmy said. "Your body is already attempting to burn off what is, in effect, overabundant life fuel." He opened his bag crisply. "I'll have to take you off mestemerone. Retrogressive reaction. In anticipation of your needs, I had some jassi-K7A delivered."

Malmy raised a bright yellow bottle that had a black-and-red label. He walked around to Mrs. Paddigrew. "Now this is something vastly different. You'll get a different effect entirely from that which you are used to. You may shake worse, even. In fact, I suggest you deliberately burn off some of this blobulin yourself. You have some lively music tapes?"

"Yes, of course."

"Good. This jassi-K7A should last you four or five weeks. If you feel a bout of trembling coming on, switch on the music and dance. Dance as wildly as you like. You will know when you have burnt enough, because you will feel tired but better. All right?"

"Yes, Doctor," she said. "Dancing?"

"Yes. Let yourself go. The treatment is modern," Malmy said, filling his syringe from the bottle. "Id-oriented release, it is called. Has had notable success in Sweden. Queen Ingrid herself is once more up and about, and attending state functions.

"Now there," he dabbed at her ready arm and expertly speared. "If you follow my instructions, your condition will improve enormously."

It took but a few moments of care and attention. "There."

Malmy returned the instrument to its case. He snapped his bag shut. "I don't expect you to have any trouble, but you know that if you are in any distress whatsoever, you have but to call."

"Thank you, Dr. Malmy," she smiled. "You are so kind. You know that I will do my best not to disturb you unnecessarily."

"I do indeed," Malmy replied. "My main concern is that you might suffer rather than call me."

"Well . . . Would you like a cup of coffee before you go? Look! I've stopped shaking already!"

"Splendid! Yes, I would *love* a cup of coffee, Mrs. Paddigrew. And you, Watson? Ah, you haven't tasted Mrs. Paddigrew's coffee . . ."

Malmy pressed the button.

"It was all I could do to refrain from intervening," Fudder growled. "Ethics alone kept me from denouncing you on the spot."

"I'm grateful for your adherence to the code," Malmy said. "She'll be all right for at least another month. Notice how pleased she was to have something harmless that most people do not have? There's nothing quite like conveying to a person a sense of innate specialness. That, and a suggestion of an affinity with royalty."

"Bunkum," Fudder said disapprovingly. "Bunkum, bunkum, bunkum."

"I would like to find her a husband," Malmy said. "That's what she really needs. Companionship. Nothing is more conducive to the magnification of twinge than loneliness."

"Bah! A box of pills, and she would forget her worries."

"That is the easy way out, Watson. Not for her, but for us. She is human. To merely dole out pills is a part that can be played by a machine. What I give to her cannot be supplied by machine. And in return, *she* recognizes *me*."

The elevator doors opened, and they stepped out, along the corridor and back into the street.

"The needle," Fudder said. "Don't you ever prescribe a pill?"

"Occasionally. But pills are too impersonal. They have to be self-administered. The responsibility has to be assumed by the pill taker. The need for self-reliance is ever a discoverer of weakness. Responsibility for any problematical action is avoided wherever possible. Given a choice, a large number of people would prefer to have the decision made for them. The inclination is to let the onus be upon someone else. And if that someone be a doctor, a short, sharp pain in the delivery of a cure perversely seems to accentuate a belief in its efficacy. I dab with cotton wool that is damp, not with anesthetic, but with water."

"Dammit, don't you use *any* drugs?" Fudder sounded aggrieved.

"When I think necessary. But I select my patients with care. The genuinely sick I pass on to the specialists. Get a broken arm or leg now and then and give them a dose of kwella before packing them off to the Center, but, generally speaking, I'm not much interested in those who lack the qualities that they want a drug to inspire. I mean, a drug cannot expand what isn't there in the first place."

Fudder snorted. "You astound me. Drugs are simple and effective. They have been researched and perfected over the years. You have a store, a reliable store, of drugs to appease any and every need, and yet . . . and yet you, *you* openly eschew these aids, and you have reverted to something that is akin to primitive witch-doctoring."

"Very true, Watson." They had reached his home again, and Malmy

activated his front door. "Lot to be said for the old witch doctor. He took his patient's illness upon himself. Very comforting to the patient, that." He deposited his bag in the hallway.

"You think so?" Fudder was distinctly skeptical. "Rattling bones and meaningless stinks would be no comfort to me."

"No," Malmy said drily. "Your confidence needs the smell of antiseptic, crackling white, and the hum and tinkle of surgical hardware."

Malmy moved into the room. "Crutches. They all need crutches. Salvador Dali pictured it very well. A man's mind is small, and a man is very, very rarely positively sure. Life is guesswork, and people constantly turn to what they think are authoritative sources to back up or shatter notions that they have conceived. That another person is merely a human being who is likewise chock-full of doubt seems immaterial."

He glanced at his wrist. "Half-past eight. I have another client due. A young . . . Ah!" As if in answer to his declaration, chimes struck an abbreviated chord. "Retiring chap. Over restrained."

Malmy disappeared back into the hallway, to return in a few moments with an unaggressive gentleman who seemed somewhat depressed.

After a most superficial perusal, Malmy returned his card to him, and led him to ensconce himself in the recliner that had recently been occupied by Mrs. Laytely.

"Mr. Broyle, this is my colleague, Dr. Watson. Mr. Broyle is a member of the governing body, Watson." Malmy rubbed his hands. "Now, Mr. Broyle, let not the presence of Dr. Watson disturb you. He is not long returned from Edinburgh University, where he taught Scientific Personal Evaluation for very many years. You may speak before him with the full assurance that your every word will be considered completely private and confidential."

"Er, yes."

"What is your difficulty?" Malmy asked, intent as a hawk. "When you called, you indicated a fear that you lacked self-assertiveness."

"Well, yes." Broyle shifted in his seat. It was not easy. "Ah, well, see, it's like this. Ah, I just don't seem . . . to be able to go along with—Or, rather, I do, but . . . well, I'm not as enthusiastic as I should be. I'm a party man. I believe in our party, I really do. It's a great party. Uh . . ." He came to a stop.

"But you have doubts, is that it?"

"Doubts?" Broyle did not like the word. "Well, no, not exactly. No, I wouldn't say doubts." He thought about it. "No," he said with greater emphasis, "I have no doubts. Leastways, not about the party. No, but I have doubts about myself."

"Ah." Malmy seemed to recognize the situation. "You feel that you are not worthy of the party?"

"Oh, well . . . No, I wouldn't say that exactly. I mean, well, there must be discipline, mustn't there? I mean, a man can't go his own way, can he? That's what a party's for . . . unity. I mean, to disagree on some points, and to . . . well, to give credit to the opposition, I mean, that's not right, is it?"

"Isn't it?" Malmy said. "Let me see, I'm beginning to get an outline. You are a member of the party and you see things being done of which you do not approve. However, for fear of your party superiors, you lack the courage to speak out. So you have come to me for something that will embolden you to denounce your party fellows when you feel that they are in error. Is that right?"

"Huh?" Broyle started in alarm. "No! Listen. I don't want to attack my own party, do I? You've got it wrong. That's the negative approach. That's the very thing I wish to avoid. A man should be loyal, shouldn't he? And I want to be loyal. I should be capable of overlooking minor deficiencies."

Malmy pursed his lips. "You have a sense of group inferiority. You feel that this is a challenge to your allegiance and, as you shrink from suggesting corrective measures to your own leaders, you wish for something that will enable you to ignore internal party defects. You want something that will help you to unwaveringly embrace even the most inconsistent of party concepts. I have the very drug for you."

"Huh? Oh. Now wait a minute," Broyle said. "It's not my place to speak, is it? Who am I to criticize? Isn't there as much outside that demands attention?"

"Of course there is," Malmy concurred patronizingly. "There's plenty to focus on without concerning yourself with your party's shortcomings. You can easily duck out from such prickings of conscience, and the feelings of guilt incurred by remaining silent. That's what I'm here for."

Malmy reached over his service table and picked out a small, flask-like bottle that contained a murky purple liquid. The label was too tiny to be read except by close up squint. "This is a fixative that will resolve your hesitancy and faint-heartedness, will assist you to unquestioningly support the cause you wish to espouse without having to concern yourself with bothersome details."

Broyle did not look too happy. "It's not like that really. I just want to be motivationally secure. I don't want to become a robot. I just feel I should be more party-dedicated than I am. Truly dedicated, I mean . . ."

"Naturally." Malmy's superior smile was irritating. "This," he shook the small flask, "is fanaticine, an ambition channeller. Very potent. Induces a self-contributive state of mental receptivity over a period of four hours, one hour after

administration. All you have to do is to go home and steep yourself in party doctrines, and you will become a biased one-track partisan. Roll up your sleeve, eh?"

"Here, hold on," Broyle said. "That's rather severe, isn't it? I mean, well, I'm not sure that . . . that—"

"Not sure? There, you see? You are vacillating over a simple thing like this."

"I'm not vacillating! It's just that, well . . . it's too extreme. Something milder should do."

Malmy shook his head positively. "Oh, no it won't. You need something powerful. Obviously you have a loose and quibbling nature, an indeterminate character that manifests itself in your lack of ability to freely express your own thoughts."

"What?" Broyle did not much care for this appraisal. "I can express myself. I'm not afraid to say what I think."

"Oh, yes? Then why are you here?" Malmy smirked. "You are a party yes-man, and you want something from me to make you feel happier about it. And this," he pointed to the purple liquid, "is it. I promise you, tomorrow you . . ."

"I'm no yes-man!" Broyle protested loudly. "But I do have obligations! Consequences have to be weighed."

Malmy gave a knowing glance to Fudder, who was beginning to gape as his mind made an effort to cope with this unorthodox procedure.

"Precisely," Malmy said, glad to accept the point. "You must do as you're told. Mustn't upset anybody, must you? Now, by using this fixative . . ."

"I'm not like that!" Broyle was goaded to complain. "Do you think I have no mind of my own?"

"Well, have you?" Malmy inquired sardonically. "You sound like a born follower who just wants his notions solidified for him. And here I can help you . . ."

"I'm not as bad as all that." Broyle was getting very cross. "I have flexibility of mind, and I want to keep it!"

"Oh, yes, flexibility." Malmy failed to conceal his amusement. "You want that even if you don't use it?"

"Are you trying to tell me that I'm just a . . . a . . . a servile cog in the party machine?"

"Turning at its bidding. I couldn't have put it more succinctly myself. It is apparent that you are too timid to raise objections, or to run counter to any declared party policy. Now this . . ."

"They don't tell me what to do!" Broyle swore hotly. "I'm my own man! You make me sound like a sheep. I'm not afraid to speak my mind!"

"Oh? You imagine yourself as the courageous outspoken type, eh?" Malmy sneered. "One of those men who, in dreams, is not afraid to stand up for his," his face registered disdain, "principles."

Incensed, Broyle struggled to spring out of the recliner. "I'm not afraid to have ideas of my own!"

"No," Malmy gibed. "You're just afraid to voice them in public. Hah! You're a toe-the-liner if I ever saw one. You'll do what your party boss says and make excuses for yourself till you're a complete puppet."

"What do you think I am, a weakling?" the infuriated Broyle cried.

"You needn't be," Malmy answered in an insufferably supercilious manner. "One good dose of fanaticine and you will become a self-opinionated tiger. It will make you direct, forceful, single-minded . . ."

"I don't want to be self-opinionated and single-minded!" Broyle shouted. "Single-minded is narrow-minded. A broad view must always be taken. All questions have more than one side, and all sides must be considered!"

Malmy shrugged. "What good is that to you? You haven't the gumption to do anything about it." Condescendingly he said, "Why don't you face it? You're too weak to open your mouth."

Broyle goggled at him, temporarily wordless, his pump working overtime.

"Best thing you ever did was come to me," Malmy continued. He extended the small bottle between his thumb and forefinger. "One shot of this stuff will give you character, dogmatism . . ."

Broyle exploded. "I don't want your damned drugs!" He trembled with wrath. "Weakling, am I? I'm not that weak! Puppet, am I? I'll show you! I'm not afraid to speak!" With an angry sweep of his arm he knocked the bottle flying from Malmy's fingers. "And I don't need that, either!"

Malmy swiveled his head, and was dismayed to see the fragile container smash.

"I'm not having my mind set like a lump of concrete! I'll think what I damn-well please, and I'll say what I damn-well like! Hear me? I'll say what I damn-well like!"

And with that, Broyle stamped furiously to find his own way out of Malmy's home.

Malmy followed at a safe distance. "I'll bet you come back inside a week," he prophesied. "I'll get some more in especially for you. You'll find that you'll need it still."

Broyle sputtered incoherently, and threw the front door open with such violence that it bounced back to catch him as he was halfway out, giving him the savage pleasure of venting his temper upon it once more with even greater force.

Malmy had to open the door again himself in order to call one last piece of information. "I'll leave an appointment blank for you, next week at the same time!"

The retreating figure hunched unheedingly, stomping a stiffly brisk departure.

Malmy returned, smiling, to his consulting room. "Excellent, excellent," he crowed in self-congratulation. "What did you think, Watson?" Malmy looked at his wrist. "We have a few minutes."

Fudder was pale and seemed to have contracted some kind of ague. "I . . . I . . ."

"Hm-m-m? Anything wrong, Watson? You seem a trifle agitated."

"I'm . . . I'm horrified. What do you think you're doing? To . . . to deliberately antagonize—" His head shuttled helplessly. "Only by exercising the greatest self-control was I able to . . . to . . ."

"Come, now, Watson, you don't expect my treatments to be stereotyped, do you? Each cure is handled on its merits. That's what makes them so interesting."

"Kuk . . . kuk . . . cure?" Fudder was astonished. "That was a cure?" he squeaked.

"Of course. In his own way, he, too, lacked faith in himself. You should be familiar with Adler's theories. He wanted to take the easy way out. He wanted, in some measure, to pass his responsibilities onto other shoulders, to let other people do his thinking and arguing for him."

Fudder puffed with some indignation. "He has a perfect right to . . . to some ameliorating factor. As . . . as . . . as . . . as a legislator, he . . . he has a perfect right to . . . to claim some relief from the . . . the burdens of his office. A little placiconch would have served him very well."

Malmy differed. "No. Don't you see? Drugs are an aid to weakness. He left a far better man than he arrived. I am sure that he will endeavor now to prove that my carefully conveyed contempt was unjustified. A man is not told that he is spineless by his friends, and he gives no credence to such a description given by his enemies. But coming by unmistakable insinuation from a qualified professional . . . Ah! That is unbearable."

Fudder's eyes glazed. "It—" He didn't know what to do with himself. "I . . . I— But," his hands weaved, "there *are* drugs that *will* help him."

"No, not really. Give him an illusion, that's all. Achievement through drugs is no personal achievement at all, is it? Drugs are no substitute for reality. It does a person good sometimes to see themselves in an unfavorable and unwanted light. It gives them an awareness of a picture to consciously eradicate."

"You're a renegade, an out-and-out renegade!" Fudder denounced. "No drugs. Not even pretend drugs. You don't . . . you don't even care about a fee!"

"Uhuh? A fee? Oh, I'll get my fee all right."

Fudder gripped the back of the recliner for support. "You will?"

"Naturally. You saw him smash that bottle."

Fudder gulped. "He won't pay!"

Malmy dissented. "Oh, yes he will. There's an even chance that he'll settle as soon as he gets the bill. Failing that, well, I'll just have to apply a little pressure."

"Aahaaah!" Fudder was shaken to the core. "It's subversion! It's malpractice! It's exceeding your authority!" He fought to frame his accusation. "You . . . you . . . contravene all—Blackmail! You . . . you'd stoop—?"

"Not blackmail. A laborer is worthy of his hire. It is a matter of principle," Malmy said reasonably.

"But . . . but it was nothing. Nothing! Was it? Just muck!"

"No, no," Malmy corrected. "That was genuine stock. Sissicathodroxipac. Obsolete medicinally now, of course, but useful insomuch as it is housed in a particularly frail vessel that shatters very readily."

Fudder was appalled. "It is scandalous that you should have the temerity to take such . . . such radical action."

"Basically the decision is mine, with or without drugs, isn't it? Either way, reliance is placed upon my judgment. I cannot see how you can fail to grasp this simple fact."

"You are licensed to dispense drugs," Fudder announced with some pugnacity, "drugs of well-defined effect, explicitly and exactly refined to cover every possible requirement through the whole range of card variables." He rubbed his forehead. "Yet you purposely decline to use them!"

"On a great many occasions. My clients seem to manage amazingly well without them."

Fudder could not take much more. He felt dizzy. "Outrageous. Absolutely outrageous."

"Hm-m-m? What's up, Watson? You don't look so well."

Fudder felt his way slowly around the recliner. "Never have I heard—Never have I seen—I'm shocked, deeply shocked." He stood, the very personification of scandalized reproach. "You give me no alternative but to urge the Council to revoke your license immediately. You know who I am. Knowing your reputation, I have strained to be tolerant, but this . . . this flagrant abuse—!"

"Here, would you like a drink? A drop of brandy, say?"

"Huh? No! You know that an inspector never . . . *never* should take a drink while holding a practitioner's premises under examination."

"Ah, yes. But I like to make the offer. And you do seem to be rather upset."

"Upset? I should say I am upset!" Fudder panted. "Do you realize that by your . . . your efforts to inveigle people to have faith in themselves, you inevitably undermine the necessity for drugs? You have a position, a high position, obtained by strict screening. How you

ever were passed I can never imagine."

"I was clever," Malmy admitted modestly, looking at his watch.

"Clever? Deceitful, more like it," Fudder bristled.

"Only where I thought it was necessary. I am an honest man at heart."

Fudder made strange noises getting his breath. "Honest? You call yourself honest? When you lie and cheat and practice subterfuge as a matter of course?"

"I have faith," Malmy claimed. "I believe that what I am doing is right. I may make one or two mistakes here and there, but I feel that I have done no harm at all to those who matter, my clients. I believe that my methods have been as beneficial, or even more so, as any of the drugs upon my shelves. I believe in myself, you see, Watson, and for me to use drugs instead of ability and talent would be for me to deny my own integrity."

"Presumption," Fudder breathed. "Sheer presumption. Your attitude is one of unregenerate conceit. You are a disgrace to your profession. You are positively dangerous!"

"Dangerous? Yes, I suppose so. Still, I cannot subordinate myself to comply with a system that all my instincts tell me is wrong, a system which inherently falsifies values, and which, eventually, promises to entirely eliminate human self-dependency."

A Department of the Army Technical Bulletin developed by the Provost Marshal General's office (TB PMG 8) deals with "Techniques of Surveillance and Undercover Investigations." Section II, paragraph 11 on pages 8 and 9 states as a final sentence: "During Fixed surveillance the surveillant should avoid any actions; e.g., staring at the hands or the individual's head which would through the recognized phenomena of sixth sense (mental telepathy) perception, compromise the investigator's mission."

"Poppycock! Drugs help people. Where would we be without them?"

"You are the voice of the drug industry," Malmy said pensively. "To you, results do not count if drugs are not used. Calling upon the resources innate in every human being, and giving guidance and confidence by innocent strategem, is nowadays peculiarly regarded as being unfair."

"Crub . . .innocent!" Fudder became speechless for a while. His face reddened, and his mouth opened and shut soundlessly.

"Here, are you sure that you won't have a drink, Watson?"

Fudder shook his head vehemently. "You . . . know the regulations," he got out heavily.

"Ah, yes. And you broke them, didn't you?" Malmy wagged a finger at him. "You had a cup of coffee at Mrs. Paddigrew's, the same as you did last time. Naughty boy."

Malmy studied his watch again. "You ought to be glad to know that I do use drugs sometimes. The dose of facilhyp you sucked in should be taking effect about . . . now!"

"Grugah!"

"Exactly. Good old reliable Watson. My only regret is that, though I try every time, I can never seem to penetrate and draw out your more delicate emotions and sensibilities."

"Grugah!"

"Oh, well," Malmy sighed, "I suppose you'll be around again next year."

He took the dazed Fudder by the elbow and eased him unresisting into the recliner. He drew up a chair to seat himself knee-to-knee with the suddenly blank man. "Now then, let me once more impress upon your memory a clear conception of my rigid, punctilious, impeccable efficiency and professional fidelity . . ."

"Good night, Dr. Malmy. As always, it has been a pleasure to have spent an evening with a man of your very exceptional selective skill."

"You are too kind," Malmy said. "I merely employ my knowledge to the best of my humble ability in an endeavor to alleviate the depressions of my clients. I feel thus, in some small way, that I may be serving the community."

"Would that there were more like you," Fudder replied sincerely. "Scrupulously zealous, upright and devoted."

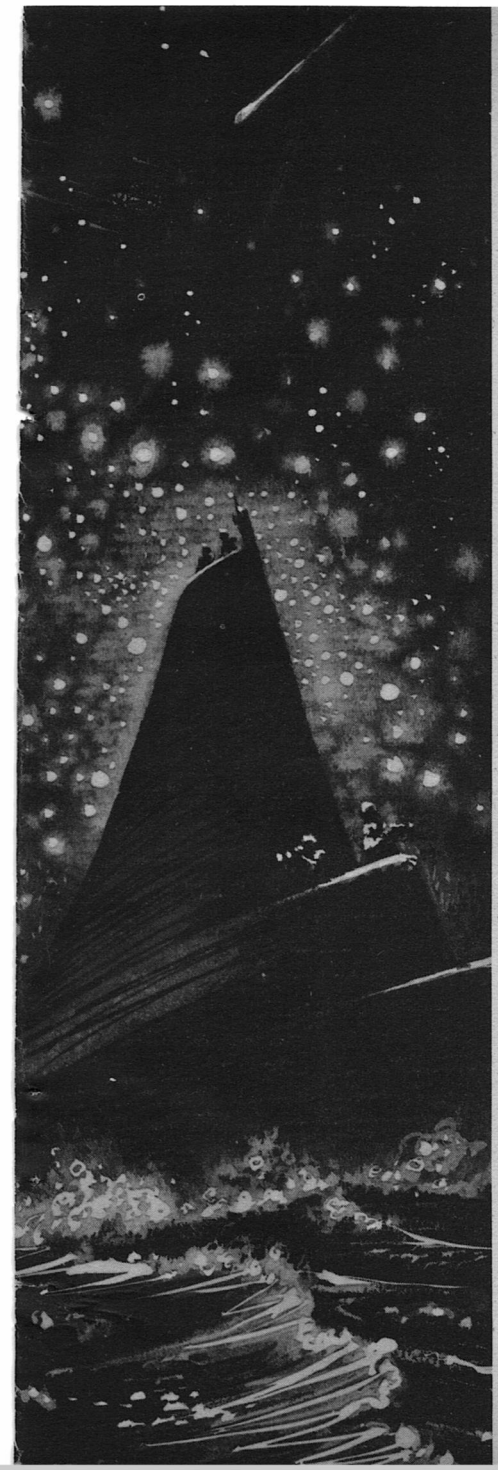
"I do not deserve such praise," Malmy answered self-deprecatingly. "You are always most generous."

"Nonsense. It will be my pleasure to again commend and endorse your competence. A very good night to you, sir."

"Thank you. And a very good night to you, Inspector."

Fudder turned away, and made towards his parked vehicle.

Dr. Malmy closed the door and, smiling beatifically, blithely began to whistle. ■



mission: red plague

JOE POYER
Illustrated by Kelly Freas

The reconnaissance jobs were designed for super-high-altitude—200,000 feet or so. But sometimes you have *to get down close to understand what's going on. And the other guy's war is not a nice thing to get close to!*

Far to the east, dawn exploded over the edge of the Indian Ocean, sending streamers of light flaring into the sharp reaches of the upper atmosphere. From his vantage point at one hundred and twenty thousand feet, Marshall idly watched the scarlet disk begin its crablike climb. The auto-course plot placed him some sixteen hundred miles east of Java and loafing due north along longitude 82° at Mach 1.5. He was too far south, and in any event it was too dark below to see the beginnings of the Indian subcontinent still eight hundred miles north.

All instrument displays were reading into the green as he ran through the check sheet. He keyed the computer with the information that he was on-duty and in control, and immediately felt an increase in the intravenous flow of stimulants. For a time, he put the A-17 reconnaissance aircraft through a series of paces at Mach 4, reveling in the response to the fingertip controls mounted on the handholds of the acceleration couch. Satisfied that all systems were responding properly, he dropped the speed back to Mach 1.5 and relaxed.

The rising sun turned the black sea pale orange as it crept westward in defiance of the night sky that still held Marshall. For the moment, he was free to watch the sunrise and he did so, enjoying the rare moment of beauty and inactivity. The pale tints of the horizon clashing with the bold colors of the sun and sea were heightened by the hallucinogenic drugs used to stretch his time sense. Vividness, bordering on the sensual, was added by the family of amphetamines that extended his reaction times to cope with the sensitive aircraft controls.

Finally, the command scope blipped for attention. Still half lost in the march and countermarch of color before him, he keyed the read-out switch: "RENDEZVOUS —5 MINUTES. TRANSMITTERS TO WARM-UP." Swearing under his breath, Marshall went back to work.

Four hundred feet beneath the surface of the Indian Ocean, exactly eight hundred and eighty-three miles south and west of Mali in the Maldive Island chain, the torpedo shape of a U.S. nuclear attack submarine climbed silently toward the surface. The *PATRICK HENRY* paused at one hundred and sixty feet while the electronic detection gear housed in its bulbous nose sniffed the sea and sky for a hundred miles around. When the sub's commander was satisfied, he gave the order to surface.

Minutes later, the conning tower broke through the waves and lifted into the warm night air until the decks were awash with phosphorescent water. The conning tower crew moved quickly to assigned positions with night glasses for visual sweep in the event the detection gear had been fooled. Ahead of the conning tower, the deck broke open and a helical antenna, mounted on a triangular pedestal, rose from the Number One missile hold to begin searching the sky.

Commander Fritz Warren came on deck and slipped a pair of earphones over his head. Too tense and preoccupied to enjoy the soft night which the faroff dawn had not yet touched, Warren hunched over the railing, listening with one ear to the low conversation of the conning tower crew and waited for the first crackle of high-frequency static that would signal contact.

Two minutes went by. Lieuten-

ant Geoffrey Powell came up onto the bridge and touched his arm, "Time, sir, in two minutes."

"Thanks, Geoff," Warren replied abstractedly.

"Damn, sir, this is the third time we've been booted out to the boondocks to deliver somebody else's mail. I wish they would tell us who gets it."

Warren grinned at his Executive Officer, "So do I, Mister, so do I."

Powell looked at his watch and peered around at the crew on the conning tower catwalk for a moment, all busy with the glasses. Then he tensed, holding his wrist out so that Warren could read the dial. The distinct sound of HF static rattled as the second hand on the watch touched twelve.

"ACHILLES," Warren said softly into the mike, "this is HECTOR. Stand by."

"HECTOR . . . this is . . . ACHILLES . . . standing by." The recon pilot's voice was slurred and drowsy as he spoke slowly and distinctly over the drugs.

A low squeal filled the phones for exactly four seconds, then the pilot's voice was back. "Transmission . . . complete."

"Very good. Instructions from Zeus at 0600 local time. Good luck."

Warren broke contact and sounded the diving alarm. Forty seconds later the decks were clear and the *PATRICK HENRY* began its descent to four hundred feet. The hatches over the missile hold snapped shut as sea water cascaded across the deck and the submarine angled down leaving only the disturbed pattern of the waves to show where she had been.

Oh-six-hundred, Marshall thought to himself. So Zeus was to provide his next set of instructions. He checked his log and found that Zeus was a satellite named simply Advanced Reconnaissance 7. AR-7 was a second generation SAMOS in a one hundred nautical mile orbit and following a polar track. That meant a big one coming up, and a dangerously low run across Soviet territory.

Which in turn would mean that Soviet interceptors would be expecting him to show up sooner or later. Oh-six-hundred. Seventy-five minutes away. It looked like a long day ahead and sleep was in order. The on-board computer obviously thought so, too, from its correlation of his physiological status and the content of the sub's message. Before Marshall had time to even lift his hand to the control panel, the drug-titrating light went on and he went out.

Somewhere south of the Chinese border town of Tahcheng—presently in Soviet hands for the second time in as many months—Advanced Reconnaissance 4, traveling a parallel track to AR-7, but two hundred miles west and half an or-

bit ahead, had detected a high degree of infrared activity twenty miles behind Red Chinese lines. Immediately its IR and visual light telephoto cameras set themselves in readiness as the satellite approached on its closest track this orbit. At the optimum moment, recorders were activated and immediately they picked up the two images. In its brainless way, AR-4 was excited by what it saw. The visual-light cameras showed a cluster of trucks and, more important, a special variable called a 210 mm cannon mounted on a massive crawler. As AR-4 watched, the cannon spat a shell. The IR cameras saw the flash of fierce gases erupting from the muzzle and immediately the computer tripped a relay that caused tape to spurt through the reel. The visual-light cameras tracked the shell in free flight as lenses shifted to follow its trajectory.

In the twelve seconds of flight, the shell flew unerringly to detonation. There was no explosion worth mentioning, merely a spreading cloud recorded by the IR cameras until it cooled and was lost in background scatter. Program 14—designed to watch for nuclear weaponry—noted the disappointing burst and gave way to Program 1, *GENERAL SURVEILLANCE.*

Program 1 took its time digesting the data—all of three nano seconds—then scanned rapidly across its disk memory to match this variable against any of the eight billion bits of data stored there. It found none. Program 1 reached the end of its track and automatically tripped Program 99, code named OVERVIEW.

Program 99 evaluated the data, found the flight pattern it needed, then instructed Program 1 to include the new datum in its General Report. Five minutes later a coded message left AR-4 and was received by a picket ship south of Ceylon. By the time the message came to the attention of the Project Director in Virginia, AR-4 was eleven minutes away over East Pakistan and AR-7 was given the task of relaying the instruction to ACHILLES.

At exactly 0500:58, Marshall awoke instantly and with no disorientation. Before he was aware that he was awake his eyes were rapidly reading the log display of the preceding hour and thirteen minutes on the scope. Beneath him, the thread of the Mahanadi River in east-central India swept into its broad delta before emptying into the Bay of Bengal. A warning tone sounded and was followed by the high squeal of telemetry. Before it had stopped, the scope was rapidly displaying the information from AR-7.

As Marshall digested the information on the screen, absorbing the implication of the 210 mm nonnuclear shells, the A-17 was already altering its flight program to climb to peak altitude where at 300,000

feet with engines shut down and in a semi-ballistic trajectory, it was hoped that Marshall would be able to avoid the optical tracking equipment in the Soviet interceptors.

Three months earlier, the U.S. had discovered that not only were the Soviets onto the closely guarded secret of the combined satellite-aircraft reconnaissance net, but they had developed an optical tracking method to cope with the threat as well. The A-17s carried some of the most advanced electronic detection and counter-detection gear in the world. The main feature of this equipment was a radar jamming technique that could create a radar blind spot nearly twelve hundred miles in diameter without affecting the accuracy of the aircraft's own radar. But this blank area on the enemy radar screens was also a dead giveaway. Three months earlier, the Soviets had succeeded in shooting down an A-17 over the Baltic Sea and almost capturing one of the pilots. Since then, radical new procedures had been instituted to prevent such a reoccurrence and the A-17s maintained peak altitudes at all times near and over Soviet territory. As Marshall read on, he was not surprised to find that his earlier suspicions were about to be confirmed. This would be the first low-level mission over Soviet territory since the present conflict had begun.

"Great," he muttered out loud, "and they pick me to do it."

So, at peak altitude and Mach 4, he streaked for the Soviet-Chinese border region south of Tahcheng. During the next half hour, Marshall busied himself with bringing his log up to date and checking out the aircraft's sensor and recording systems. By 0700 the Altin Tagh Mountain chain that skirted the Tibetan border was sixty miles straight below. The flight profile matched continuous star fixes and called for a descent to one hundred thousand feet beginning at this point. Accordingly, he brought the nose down and began a three hundred mile slanting dive.

Ten minutes later, Marshall crossed the Tarim River and passed over the Chinese city of Yerchi, a soundless scream at one hundred ten thousand feet. A ground control map flew across the scope matching his ground speed, now down to Mach 3. At the proper moment, Marshall began a long, seventy-five mile swing on a heading of 353 NW and bent to check the surveillance radar. The screen was blank with the exception of scattered blips indicating low-lying ice clouds. He cranked the image outwards, extending it to its full 1,600 mile diameter limit. There, on the western quadrant four blips were rising, probably from the base at Alma Alta. The interceptors were well inside the Soviet border and did not appear to have seen him. But it wouldn't take long for the Soviet

radar complex to discover a dead spot in their radar net and know that he was around. Automatically Marshall narrowed the counter-detection radar cover to less than a hundred miles in diameter. This would still afford him plenty of cover and make it harder for the Soviet operators to spot the hole.

He watched for long moments as the four Soviet aircrafts completed the formation and turned north and east. They appeared to be flying subsonic—probably a border patrol. But, if they crossed the border they would bear watching. To be on the safe side, he fed the data to the computer and told it to keep tracking. Then he turned his attention back to the ground-control map.

His target was now less than one hundred fifty miles distant and he began to throttle back and drop lower. The flight plan called for two passes, one at forty thousand feet to survey the countryside and a second, lower pass at under five hundred feet for close-ups.

The altimeters showed one hundred thousand feet and he leveled off and cut his speed back still more to Mach 2. Ten minutes to contact. The twisted Altai mountains that edged the Gobi desert and the rugged terrain of central Sinkiang sped by as he slanted in. Somewhere below, lost from human sight among the refuse of earth's adolescence, two armies fought a curiously silent war. Perhaps no war, Marshall mused as the minutes slipped by, had ever received less factual publicity and seen more speculation than the deadly political/military game being played below.

It was a curiously fragmented China, led by Mao Tse-Tung's heirs that fought against the Soviet Union to recover long-lost Chinese territory. It was a war that saw three Chinas involved: Nationalist China, limited to furious, but rare, engagements in the Formosa Straits; Central China fighting desperately for its existence against the third; Confederated China, now allied with the Soviet Union. The former Red Army military governors of Sinkiang, Tibet, Tsinghai, Kansu and Szechwan Provinces had broken away a year ago to set themselves up as warlords. To make matters worse they had signed mutual aid agreements with the Soviet Union. Four thousand years of history die hard, and one generation is never sufficient to change the psychology of a race. And so, the warlords were once again bidding for rule in China.

The Soviets, at first reluctant to do more than furnish arms to the warlord provinces, had found herself fighting for the life of her Siberian border republics almost overnight as Peking, in a series of lightning moves, had recaptured both Tsinghai and Kansu in less than a week, thus providing a springboard into the key eastern Siberian province of Sinkiang. At the

end of the first month, Central China held all of Sinkiang but for a large pocket of especially strong resistance in the northwestern corner still controlled by Confederated China and Soviet troops. The fighting, at first sharp and frequent, had degenerated to a fixed battle line that the Central Chinese troops were steadily pushing toward the Soviet border.

Marshall made his first run across the target in a tight circle five miles in diameter while all of his surveillance equipment—radar, IR, UV, topographical laser, and telephoto visual-light—ground away. Marshall, reading the computer massaged data, found nothing unusual so far. There was little activity on the ground, or in the air, with the exception of two Red Chinese MiG 21 patrol craft forty miles north. He had nothing to fear from the Chinese interceptors, even if he came within visual sighting distance. His speed was more than a match for any armament they carried. Marshall took her down to forty thousand and trundled across at little over Mach 1.2 for close look-see. The sensors picked out the exact location of the 210 mm gun from the satellite coordinates and displayed the area beneath the camouflage on the scope. On the IR scope, he thought he could pick out several trenches and some activity close to the gun itself, but he did not dare drop closer to satisfy his curiosity.

The laser panel was signaling for attention and he switched it up. The laser had spotted a diffuse cloud on the order of two parts per million, thirty miles east. Quickly he reran the instructions from Zeus until the data from AR-4 matched the location.

When the shell from the gun had exploded it had released a cloud. Of what, AR-4 was not equipped to tell. But it was still there after three hours, and spreading slowly, apparently on the prevailing winds. The laser showed it to be suspended now between two thousand feet and ground level. Marshall paused for a moment, then decided. He switched to turbofans and swung the wings forward and at little more than Mach 1 bore west toward the cloud losing altitude swiftly. "Gas?" he wondered aloud. If the Chinese were using gas, the Soviets might think twice about a nuclear bombing. Then he hunched back in his seat. That did not make much sense either. Marshall could not quite picture the Soviet Army being frightened by gas of any kind if their borders were being invaded.

A swollen river rushing out of hills, green now from the spring rains, slid past beneath. From his vantage point in the aircraft, the countryside appeared deserted. But he knew that the hills were full of radar sites and troop concentrations belonging to both sides and well hidden. Marshall also knew he

was taking a chance on being spotted visually, but the Chinese, with no inkling of his existence, would probably mark him as a Soviet aircraft and consider the lack of radar sighting due to the Soviet countermeasures. He hoped.

A range of pockmarked hills marched across the land falling away on their western slopes to a long valley that stretched westward to the Kazakh-Sinkiang border. In spring and early summer, the valley and slopes were green with fresh steppe grass and the frequent small rivers filled with rushing water from the mountains. In normal times, Mongolian and Tartar sheepherders drove their flocks into the region for a long summer pasturage, peacefully sharing the wealth of grass without regard to nationalities or borders. Now the valley, outwardly quiet in the early morning sun, contained only violent death.

First, the lasers indicated to Marshall that the valley was filled with the cloud. The single shell had exploded over the crest of the ridge and the prevailing westerly winds had swept the gas down from the hills and across the valley.

Marshall cut in the Terrain Avoidance-Radar and settled the aircraft into the northern end of the valley for samples. The wing scoop covers slid open and he throttled back until the wings were fully extended and he was flying at subsonic speed. He completed the first pass of the almost treeless valley at five hundred feet and saw nothing.

On the second pass, he dipped the port wing and lost altitude until he was down on the deck at little over two hundred feet and lumbering along at one hundred sixty knots. Flying a lazy zigzag pattern, he put all cameras and sensors to work and cut in the computer autopilot to take over. Through binoculars he searched the meadows and hillsides beneath. There was plenty of evidence of a past battle; numerous shell holes, trenches, shattered tanks and long stretches of churned mud left by maneuvering vehicles. Then, off to the right, at the base of a gentle slope, well hidden by a thicket of aspen and camouflage net, he caught a flicker of movement. Cutting out the autopilot Marshall continued the zag until he could make a straight pass. The ungainly three-hundred foot A-17 pivoted delicately, for all its bulk and loped across the area like a Cessna.

Watching the scope, rather than through the glasses, he could see a military vehicle similar to a jeep jerk out of the aspen and head erratically into the meadow. As he watched, the jeep coasted to a halt after the driver collapsed across the wheel. From the uniform, the driver was plainly Chinese.

Marshall cut in the computer again and checked the valley floor to the west with binoculars as the plane resumed its interrupted search pattern. Whatever that shell

carried, he muttered to himself, they did not seem to care if their own troops got hit. Then he saw what he had missed on his first and higher pass: A Soviet tank sat astraddle a point where several muddy tracks converged. Its turret gun was pointed in the direction of the hills off his starboard wing, and he could plainly see two mortar emplacements. The powerful glasses showed figures clad in the green Soviet uniforms scattered like dropped firewood. The turret hatch on the tank was open and he could see a body half in, half out. Other troopers lying on the ground were twisted into grotesque postures, some jerking spasmodically.

Marshall's first reaction was *nerve gas!* He keyed in the telephoto lens on the visual cameras and boosted the image up on the scope, closing-up on the mortar emplacement while he put the aircraft into a tight orbit at three hundred feet. Now he could see individual soldiers, some in foxholes, some scattered around the meadow as if they had tried to stagger towards the river. A single trooper lay on his back, arched over the lip of the foxhole, one arm thrown across a pile of mortar shells. His helmet has tumbled back off his head, leaving his face exposed to the early morning sunshine. Marshall could even see the man's long blonde hair stirring in the vagrant breeze. The image of the hair registered subconsciously. Marshall peered at the face, framed by the scope; it was covered with blood and vomit and the eyes were open, staring directly into the unseen camera. For a long moment Marshall could not tear his own eyes away from the face as the cameras and sensors recorded the scene in minute detail. Then he broke the aircraft out of its orbit and completed the low-level pass, his stomach extremely queasy.

Five minutes later he was finished and satisfied; he closed the scoops and climbed out of the valley.

As he cleared the hills to the east, the radar alarm shrilled and simultaneously an interceptor flashed across his nose. He didn't wait to see if there were any more, but cut in the afterburners and shot skyward, the wings folding. As he climbed, he caught sight of the second interceptor with a third and fourth not far behind.

As he watched, smoke blossomed around the lead interceptor and something streaked toward him. Before he could react the computer licked the missile with a high-frequency radar beam. Nothing happened.

Marshall slammed the A-17 violently into a spin and the missile flashed past and exploded. The aircraft rocked to the tremendous concussion and Marshall felt the distinct shock as pieces of metal ripped into the wings. The console quickly flashed a "no-danger" sig-

nal and the malfunction scope read out flak hits in the wings and destruction of the life-support system coolant and air-flow tubes. Back up systems switched in automatically. So, the missiles they were using were impervious to radar detonation, he thought grimly while his fingers flashed across the command console under his hand. Let's see them match this.

The wings, which took a full second to retract, grated into their sockets at two thousand feet and he shut the turbofan down. Blades swung away and the inlet plugs shot forward to ram high-pressure air into the engines. Ring burners flamed with the liquid hydrogen fuel now pouring into ramjet engines.

The A-17 left its pursuers in the dust and the sudden eight G's acceleration blacked Marshall out. The computer noted pilot-malfunction and took over, monitoring interceptor climb, ceiling, and the second and third missiles chasing after them. At the same time, the computer also monitored Marshall's body biochemistry and physiology, heart rate, electrical activity along neuron paths, mechanical pulse and electroencephalograph tracings, and fed the proper mix of stimulants to him intravenously.

Moments later Marshall was awake again and functioning, hardly aware of the blackout. As he reached two hundred thousand feet, the interceptors broke off chase, slanting down off their port wings to turn home. Marshall watched them go. He thought they must have spotted him with their visual detection gear as he dropped towards the valley and, figuring his radar would be shadowed by the hills, had swung around to approach from the west, right down on the decks with afterburners. Sure enough. The radar showed two Chinese MiG 21s in hot, but fruitless pursuit. The Soviets had too long a lead.

In spite of the computer's careful nursing, too big a backlog of stimulants must have built up, he thought. He was feeling kind of shaky.

The first warnings of danger came less than a half hour later. After completing the mission, the flight plan called for him to turn south again and head across West Pakistan to the Indian Ocean. His altitude and speed were preprogrammed for one hundred fifty thousand feet and Mach 2. Over northern Pakistan, the flight program called for additional instructions to be relayed by satellite. Less than thirty minutes later he was crossing the Himalayas for the second time in two hours. The contact alarm blipped at him to indicate contact with satellite AR-5. As he watched, the computer converted the data and marched it across the control scope: PROCEED 18:30° NORTH, 67.4 EAST—REFUEL.

Marshall had just finished recording the latest instructions in the log when the biochemical monitoring panel chimed for attention. When he displayed the alarm, a blood malfunction was indicated. "Aw come on," he growled and asked for the cause and got it. White blood count was staggering, indicating a widespread viral infection. Before he had time to clear the board, the panel was displaying elevated pulse rate, abnormal glucose, and parotid isolated foreign organisms. Suddenly scared, he queried the computer. What kind of organisms? While he waited he rubbed a hand across his face, and it came away soaked with sweat. He stared at it then vomited. He vomited again and again in great shuddering sobs until his stomach was completely emptied. All the while the computer displayed an UNIDENTIFIED in large red danger letters.

No wonder the Soviets were holding off, he thought savagely. The Chinese were not using gas, they were using biologic agents—germ warfare. Damn little buggers. They were just full of surprises.

Through a literal haze of pain, he could see the pilot malfunction panel glaring red from all body systems readouts. The vomiting attack passed and Marshall slumped back on the couch exhausted, his throat and stomach a mass of pain. The biochemical panel buzzed for attention and he fumbled at the readout switch. The computer-correlated symptom data was flashing for an immediate dosage of broad-spectrum antibody. Without waiting for his approval, the drug-titrating light winked on and at the same time, his suit cooling-unit shifted to take up the increased heat load he was now generating.

Below, the confluence of the Indus began to appear on the ground-control scope. One hour and forty minutes to rendezvous. Too long, his temperature was still going up and the white cell count steadily dropping. At this rate he could be dead in a few hours. He decided to change it.

Marshall pulled the helmet mike to his lips and keyed the emergency frequency in. He was answered immediately.

"What is it?" the voice crackled over the earphones.

"Suspect . . . Red Chinese . . . using bacter . . . iological . . . warfare . . . got . . . a dose . . . sicker'n na dog."

"Hold on."

Marshall waited, fighting down renewed waves of nausea.

"Symptoms?"

He repeated the instrument readings and the dosage of the antibody serum.

"Listen carefully. Raise the dosage," the voice said, speaking slowly and distinctly. Marshall heard him through a haze in which the voice receded and swelled, receded and swelled like calm waves on a beach.

"Raise the dosage to 500 c.c. Repeat that and report."

Very deliberately, Marshall fed the proper data into the computer and reported.

"Now record this: Stay on this same heading. At the rendezvous point slow to four hundred fifty knots at three angles, seal up your suit and eject. The refueler will fly cover. You will be picked up. Do not, repeat do not, unseal your suit. Acknowledge and switch to receive."

The last thing Marshall heard for a long while was the squeal of telemetry.

The A-17, its pilot near death, flew on, following the new pre-programmed course received by emergency channel. The aircraft began a measured descent as it paced out over the Arabian Sea until, nearing the rendezvous point, the aircraft was at three thousand feet and flying subsonic. Every ten minutes the computer made a cumulative check on Marshall's condition and transmitted over the emergency channel. At four minutes to contact, it woke him.

The first thing Marshall saw was the panel light still indicating pilot malfunction with its glaring red warning. His eyes refused to track and this was noted, resulting in an increase in intravenous stimulant.

The screen lit with the first of his instructions and he read it with difficulty. "SEAL SUIT." It took what seemed like an eternity before he completed the operation. His fingers refused to respond properly and the zippers on torso and arms resisted his fumbling attempts to draw them tight. Finally, the suit was sealed and he sat back to await further orders. Minutes later, the KB-58 refueler slid on-station off his right wing.

He could see the pilot's oxygen-masked face, hand raised in query. He waved back weakly and the pilot waved again, then tapped his helmet. Marshall understood and flipped the radio switch.

"How are you feeling in there?"

Marshall tried to sit forward and failed. "At first I was afraid I was going to die, now I'm afraid I won't," he joked weakly.

"Bad, huh?" the pilot sympathized. "O.K., let's get you downstairs where they can treat you. Let's run through the list. All right?"

"Yeah, and make it short." Marshall leaned back in the seat and closed his eyes.

"Right. Number 1. Seat belts?"

"Tight."

"Safety off."

"Check."

"Transmission ready."

"Check."

"Transmit."

Marshall thumbed the button and the last of the information he had gathered was gone. "Come on," he said hoarsely, "hurry it up."

"Destruct switch on," the other went on implacably.

"On." Marshall clipped out. "Autopilot on."

"Uhum."

"Aw, the hell with it. There are twenty more items and not one of them worth a plug nickel. I'll give you a five-second countdown. Check your speed on Mark 3. It should be three hundred knots on the nose."

"Yeah, let's go."

"Mark 5 . . . 4 . . . Mark 3 . . . 2 . . . 1, eject!"

Marshall, his eyes still closed, squeezed the handle and the seat covers folded down fast. The entire nose exploded upward in a high, fast arc to clear the tail. He fainted, revived and fainted again before the seat covers fell away leaving him dangling beneath an orange parachute canopy. Stupidly, he watched the water come up and was surprised when the harness snapped away a few feet above the water and he plummeted down.

Through his faceplate, the surface of the water fell away above, then raced toward him as his air-filled suit bouyed him upward. He gagged again, retching feebly.

As the spasm passed, he glimpsed a figure in a wet suit approaching through the water, and behind him, a gray wall that had not been there when he landed.

"Did anyone . . ." he tried to call to the swimmer, "see the plane . . . explode like it should . . ."

The wet-suited UDT swimmer circled Marshall's still form and approached carefully to snap a long nylon cord to the pressure helmet. He tested it with a sharp tug, then waved an arm at the crew members on the aft deck of the *PATRICK HENRY* to tow him in. The KB-58 refueler rocketed low overhead, wobbling from side to side in farewell and was gone in a burst of afterburner flame.

Commander Warren tucked the coded message from Virginia into his pocket and watched as the limp body of the pilot was taken aboard. As his exec came onto the bridge, he said: "Well Geoff, you wanted to know who got the mail. There he is."

The exec remained silent as the stretcher was being hurried below to the dispensary. Then he turned to Warren. "What happened, sir?"

Warren stared back for a moment before answering, weighing all he knew about this young officer. The story was bound to get out sooner or later, he knew and the executive officer in particular, had better be ready to back him up, if necessary. He decided to tell Powell the truth.

"That man is a pilot of a special type of reconnaissance aircraft that I won't go into now. He was investigating a certain action in Sinkiang that turned out to be a biological warfare attack by the Chinese. It looks like he got himself exposed and came down with some kind of disease."

Powell opened his mouth to

shout, then caught himself. "Germ warfare, Captain," he strained for control. It was a statement not a question and Warren could see the same horror in the man's eyes that he himself felt.

"What kind of disease? My god aboard a submarine—"

"Hold it, Mister," Warren interrupted, his voice low to match that of Powell's, but the whipcrack was there. "Germs or depth charges, there's no difference." Warren ticked off the reasons. "One, his life is in danger and he needs help. Two, he's extremely valuable to the country. Three, we've been ordered to do everything possible to assist."

Powell stood stiffly a moment, emotions conflicting with duty. "Yes, sir. Your orders, sir."

Warren grinned and punched him gently in the shoulder. "He's in isolation, son, and we're setting a course for New London. Hop to it."

Lights flickered and swayed, approaching and receding at tremendous velocities. Eons passed and only the procession of lights was apparent, surrounded on either side with swirling darkness.

"Easy with him! Swing around the other way."

The sharp voice snapped the lights into place. They were overhead lamps lining a steel-walled corridor. A brown face half covered by a surgical mask glided into view.

"How you feeling, fella?"

"Not so good . . ."

The face began to recede and revolve at the same time. Vertigo clutched his stomach and Marshall grabbed for the edge of the stretcher. The effort was too much for him and he passed out again.

"All right, set him down here, then you guys get down to Radiation Control and shower thoroughly. Report back here in two hours."

Warren stepped aside to let the two sailors pass. In the center of the stainless-steel enamel room squatted a surgical table. In spite of himself, the pilot, whose name he did not even know, was the horror shrouded focal point of the sterile vault. At the hatchway, with the two sailors hurrying away down the corridor, Warren was aware of the violent death rampant in the body of the man within and this made him hesitate. He knew there was really nothing to fear from the pilot, whatever disease or diseases his body harbored. He also knew that like radioactivity, bacteriological warfare presented few hazards that could not be coped with.

He entered the medical bay and crossed to the surgical table. Marshall's helmet was open and the sleeve of his pressure suit had been slit to the shoulder. He examined the flushed features and exceedingly dry skin that looked like centuries old parchment and reached a tentative hand to touch the forehead.

"Don't do that!"

Warren jerked his hand away.

"Sorry, Cap'n, didn't see it was you. Just the same, don't touch him or you might be right there in the next bunk."

"How is he?"

The medic walked over to the table and with a rubber-gloved finger, peeled back an eyelid.

"Pretty bad, sir. Pulse 160, breathing deep and irregular and he's unconscious. I just finished a white cell count and he's got a tremendous viral infection going."

"What are his chances," Warren asked finally.

The medic glanced at Marshall. "Damned poor, unless—"

"Unless what?"

"Unless I can figure out what kind of infection and where the devil he might have got it." The medic, whose name was Peter Shultz, tugged down his surgical mask and lit a cigarette, then looked Warren square in the face.

"O.K., Cap'n, give. What do you know about this guy?"

"Sorry, Shultz, that's classified—"

"Classified be damned," Shultz exploded. "I don't have time for any Mickey Mouse nonsense. How bad do you want him alive?"

Warren bummed a cigarette and lit it from Shultz's, all the while reflecting that Shultz was the only man in the entire Navy who could talk to him like this and get away with it. Shultz may have been just a medical corpsman—submarines did not rate a doctor—but in the past twenty-seven years, he had probably gathered and used more specific medical knowledge than any three physicians. Warren would have trusted Shultz with his life. He also recalled the orders relayed to him by the KB-58. Three words and a signature—"Keep him alive," and signed by the President.

"O.K., Shultzie, you win." He did not even bother to caution Shultz about talking. Shultz wouldn't. He told what little he knew and then only about Marshall's mission.

"*Whew!* That's quite a story, Cap'n," Shultz said when Warren finished. "You aren't putting me on, are you?"

"No."

"Well, I suppose that makes it a little bit easier. If it's a biological warfare agent, then we can pretty well narrow it down to several specific diseases. The vomiting, high fever, shock, flushed skin, could mean any one of several aerogenic bacteria . . ."

Shultz stopped and appeared to be deep in thought. Then: "O.K., Cap'n, you better get out of here, or I'll have to quarantine you, too."

Warren nodded and left.

As he made his way forward, he noticed gathering knots of crewmen, arguing in low voices. As he approached, they broke up, grinned foolishly, and eddied together again like so many autumn leaves as he passed. In the mess hall, he found what looked like half the off-duty watch gathered and talking in low voices. The talk stopped suddenly as

he slowly stepped through the hatch.

Warren recognized the symptoms and the mood of the crew. And he was suddenly angry that this could happen aboard his ship, to his crew. He had had twenty-nine years of Navy service to study the microcosm of civilized society under stress that was a submarine crew, and he knew that there would be no way in the world to reassure these men at this point and that to try could very well be disastrous.

Marshall drifted through a world of hallucinations, of swirling color and knife edged sound. And heat. He was in hell, then stranded on the Arctic ice cap in midwinter. Shadow figures passed and he could not tell whether they were in his brain or in the real world. The dark face of the medic in his surgical mask, the face of the Russian soldier, blonde hair waving across the blood and mucous covered forehead; all hung before him, the open eyes of both staring. Superimposed was the back and shoulders of the Chinese trooper, slumped over the wheel of the jeep. But the three figures were never in focus, they intertwined and were washed in color as drugs and fever surged through his body. The dream wore on for an eternity and all the while, Marshall was conscious of the beating of his heart.

First Lieutenant Geoffrey Powell looked down at his hands and found that they were shaking so badly that the pencil had fallen from his fingers. He had been telling himself over and over again that there was nothing to be afraid of, that with modern medical techniques it was impossible for a plague to ravage the submarine and kill the entire crew. He believed all that he repeated over and over to himself, but could not calm the irrational fear that threatened to swamp his intelligence and send him to his quarters huddling in terror. Powell had been through the sub on rounds and had seen the same fear in the faces of the men. And he was ashamed of himself, because they mastered their feelings so much better than he. Hours had passed and he had plotted their course return to New London and now, for the next three and a half days there was nothing to do but wait, wait for the first of the crew to develop the disease.

"How long have . . . I been out," Marshall whispered.

"Just about twelve hours." The voice of the medic sounded far off although Marshall could see the lips move beneath the mask. "How about some water?"

Marshall could only nod. His throat was burning with dryness.

Shultz slipped an arm beneath his head and held a paper cup to his lips. He drank greedily but Shultz pulled the cup away after a few swallows. "Don't overdo it. Some more in a minute."

Marshall nodded again and lay back. "What's wrong with me?"

Shultz scratched his head and perched on the edge of the bunk. "The captain tells me you fly some fancy type aircraft and were taking samples of a biological warfare attack?"

"Yeah . . . at least I think that's what it was—"

"Well, it looks like you got a dose somehow, got exposed and came down with it."

"How—?"

"How do I know?" Shultz stripped off the mask and cap. "You're the one who was there."

Marshall waited for the medic to go on, thinking of the missile damage to the airflow system.

"It was the twenty-four hour flu bug that bit you," Shultz said finally.

"What—!"

"That's right. Of course, not any old flu bug, actually it was a mutated strain of Myxovirus, otherwise known as Hemophilus influenza, Type A2."

All Marshall could think of to say was, "Mutated?"

Shultz laughed openly. "Yep. Mutated by the Chinese, or whoever, to make it about three times as virulent and the receiver three times as sick. Normally A2 will knock you down about twenty-four hours after exposure; but this stuff has diarrhea, vomiting, high fever, and an eightfold increase in the infection rate added to the usual symptoms associated with the flu—"

"But why the flu—" Marshall croaked.

"Why not? It sounds pretty humane to me, a lot more so than napalm or high explosive anyway. If you were a military commander and wanted to clear out a large area of enemy troops in a short time, what would you use?"

"A nuclear bomb," Shultz answered his own question. "Maybe, but your troops couldn't get into the area immediately either. So you decide on a biological agent. You could use something like a staph, or anthrax, or rubella; some type of bacteria. But that stuff gets out of hand too easily. A shift in the wind could wipe out your own troops. You want something you can control. Some type of disease that will develop quickly and run its course in a few hours. Then you can move your own troops in and mop up an enemy too sick and weak to resist. Like you are now," he finished, then added, "a bad case of the twenty-four hour flu fits the bill."

Marshall stared at him for a moment, then began to laugh. It hurt his chest and sides to laugh but he could not stop. "The flu," he choked.

"You ain't the only one relieved. You should see the captain."

Marshall continued to laugh, in gasping bursts of relief. "Go ahead and laugh," Shultz growled. "All you gotta do now is sleep. When this story gets around, I'll have every malingerer in this boat claiming they got the Asian flu." ■

THE REFERENCE LIBRARY

P. Schuyler Miller

THE BEST SHORT STORIES

During our last year's poll of science-fiction books, quite a few readers urged me to run a similar poll to determine what you considered the best short science fiction of all time. I did and do chicken out on that for the simple reason that tallying the results would be too much work. If the same four hundred fourteen readers who participated in the 1966 poll had sent in lists of fifty favorite stories, there would have been twenty thousand seven hundred items to tabulate and cross check.

Happily, Robert and Juanita Coulson of Indianapolis, publishers of the now rather venerable but still lively fanzine *Yandro*, did the job for me. I didn't see the issue setting up the rules for the poll, but the Coulsons sent me the results, which I am passing on to you now, with their permission.

You will notice that most of the top stories originated here in Astounding in its so-called "great" days. I want to suggest one depreciating reason, which Bob Coulson —and probably John Campbell— does not buy. I see no reason why one of my old stories, even the one which most people seem to consider my best, should be in this kind of list at all—unless that greatest of old anthologies, "Adventures in Time and Space," and the two paperback selections made from it, were conditioning the reading experience of just enough of the twenty-seven people voting to get us over the divide.

If I count correctly—and I haven't had time to track down the anthology appearances of all the stories selected—thirteen of the sixty-two stories were in this anthology, and five more were in John Campbell's "Astounding Science Fiction Anthology." In fact, more than forty of the sixty-two originated here in Analog or in Astounding—which is the reason "Buck" Coulson sent me the results. Most of the *Yandro* readers participating, he reports, are relatively young, newcomers to science-

fiction fandom, so the poll is definitely *not* the result of old-timers remembering old stories nostalgically.

I find it hard to explain why some stories, such as Theodore Sturgeon's great "Baby Is Three," didn't get into the finals. Bob does point out that with prolific authors like "Cordwainer Smith" the vote was scattered over so many stories that no one of them had enough to make the final list. This same thing happened with our own poll: a one-story, or one-book author, has a better chance of "immortality" than a consistently good one. This is why it was gratifying to see Poul Anderson and Murray Leinster rank so high in our scoring, though no one of their books rated very high. This also happened with the Coulsons' poll, based on total votes for all nominated stories by a given author.

Now the *Yandro* results. An asterisk means the story originated here—and I may have missed some, because the indexes do have errors and omissions, and story names are sometimes changed. The number of votes each story or author received is shown in parentheses.

THE BEST SHORT STORIES

*(12) Isaac Asimov, *Nightfall*
* (9) Tom Godwin, *The Cold Equations*
* (9) A. E. van Vogt, *Black Destroyer*
* (8) Robert A. Heinlein, *The Green Hills of Earth*
* (8) Robert A. Heinlein, *By His Bootstraps*
* (8) Theodore Sturgeon, *Killdozer*
* (7) Heinlein, *Universe*
* (7) C.M. Kornbluth, *The Little Black Bag*
(7) Daniel Keyes, *Flowers for Algernon*
(7) Arthur C. Clarke, *The Star*
* (6) James Blish, *Surface Tension*
* (6) John W. Campbell, *Who Goes There?*
* (6) Heinlein, *Requiem*
(6) Damon Knight, *To Serve Man*
* (6) Peter Phillips, *Dreams are Sacred*
* (5) Poul Anderson, *No Truce With Kings*
* (5) Fredric Brown, *Arena*
* (5) Murray Leinster, *First Contact*
* (5) Eric Frank Russell, *Plus X*
* (5) Clifford D. Simak, *The Big Front Yard*
* (5) Heinlein, *And He Built A Crooked House*
(4) Ray Bradbury, *And The Moon Be Still As Bright*
* (4) Clarke, *Rescue Party*
(4) Clarke, *The Nine Billion Names Of God*
* (4) Campbell, *Twilight*
* (4) Heinlein, *Roads Must Roll*
(4) Heinlein, *All You Zombies*
* (4) Henry Kuttner, *The Proud Robot*
* (4) C.M. Moore, *No Woman Born*

(4) Russell, *The Undecided*
* (4) Russell, *Allamagoosa*
* (4) Wilmar Shiras, *In Hiding*
(4) Simak, *How-2*
* (4) T. L. Sherred, *E For Effort*
(3) Asimov, *The Last Question*
(3) Asimov, *Victory Unintentional*
* (3) Christopher Anvil, *Pandora's Planet*
(3) J. F. Bone, *On The Fourth Planet*
(3) Alfred Bester, *5,271,009*
* (3) Harry Bates, *Farewell To The Master*
(3) Leigh Brackett, *The Halfling*
* (3) Campbell, *Forgetfulness*
* (3) Campbell, *Cloak of Aesir*
* (3) Lester del Rey, *Nerves*
(3) del Rey, *For I Am A Jealous People*
(3) L. Sprague de Camp, *The Wheels Of If*
* (3) Heinlein, *Lost Legacy*
* (3) Heinlein, *Gulf*
* (3) Heinlein, *Waldo*
* (3) Maurice G. Hugi (Eric Frank Russell), *The Mechanical Mice*
(3) Zenna Henderson, *Pottage*
(3) Henderson, *The Effectives*
(3) Fritz Leiber, *A Pail of Air*
(3) Knight, *Not With a Bang*
* (3) P. Schuyler Miller, *As Never Was*
(3) Russell, *Dear Devil*
* (3) Russell, *Metamorphosite*
* (4) Russell, *And Then There Were None*
* (3) Russell, *Hobbyist*
* (3) Ross Rocklynne, *Quietus*
* (3) Theodore Sturgeon, *Microcosmic God*
* (3) James H. Schmitz, *The Witches of Karres*

THE BEST AUTHORS

(58) Robert A. Heinlein
(36) Eric Frank Russell
(33) Isaac Asimov
(26) Theodore Sturgeon
(24) Henry Kuttner
(24) Arthur C. Clarke
(20) John W. Campbell
(20) Clifford D. Simak
(16) Poul Anderson
(16) Fredric Brown
(15) Damon Knight
(16) C.M. Kornbluth
(14) A. E. van Vogt
(13) Murray Leinster
(13) Cordwainer Smith
(11) James H. Schmitz
(11) Alfred Bester
(10) Lester del Rey
(10) C.L. Moore
(9) James Blish
(9) Ray Bradbury
(9) Tom Godwin
(8) Robert Schecklye
(8) Daniel Keyes
(7) Zenna Henderson
(7) Christopher Anvil
(7) Leigh Brackett
(6) H. Beam Piper
(6) Peter Phillips
(6) L. Sprague de Camp
(6) James Ballard
(6) Philip K. Dick
(5) Gordon R. Dickson
(5) Philip José Farmer

(5) Edmond Hamilton
(5) Alan E. Nourse
(5) P. Schuyler Miller

TOMORROW'S CHILDREN

Edited by Isaac Asimov • Doubleday & Co. • Garden City, New York • 1966 • 431 pp. • $4.95

Here, although some of the stories will be overly familiar simply because they *are* good stories that have been anthologized before, is one of the best "theme" anthologies we've had in some time. Because the stories are *about* children the publisher seems to have decided it must be a book *for* children, and hence of no interest to adult readers. Of course, nothing could be farther from the truth, and the main result of this stupidity—as with the similar categorizing of the last Bradbury collection, "S is for Space"—is that the book wasn't bought by either the adult or the children's departments of most bookstores. I found it quite by accident, months after publication.

What you have is eighteen excellent science fiction and borderline fantasy stories *about* children and young people, from many different sources, all good. From these pages there are James H. Schmitz's "Novice," the first of the Telzey Amberdon stories, and "Lewis Padgett's" "When the Bough Breaks." You will also find such classics as Fritz Leiber's "A Pail of Air," Damon Knight's "Cabin Boy," Zenna Henderson's "Gilead," Robert A. Heinlein's "The Menace from Earth," Ray Bradbury's "All Summer in a Day," Stephen Vincent Benet's "The Place of the Gods," and Dr. Asimov's own "The Ugly Little Boy." Plus, note well, nine others almost as good but totally different. Some you'll remember, and enjoy as much on rereading as when they were new. Others you may have missed. (I most miss Wilmar Shiras's "In Hiding.")

This is one you can recommend to just about anyone—including school librarians.

THE ARTIFICIAL MAN

By L. P. Davies • Doubleday & Co., Garden City, New York • 1967 • 191 pp. • $3.95

"The Paper Dolls," the first book by this new—or possibly pseudonymous—English writer, was one of the finest psi stories we have had. (It's out in a paperback now.) "Who Is Lewis Pinder?" his second, was sent out by the publisher as SF, but wasn't. This new book—Crime Club again—"belongs" again, and though it is no "Paper Dolls," it's a good one.

We begin with a writer, Alan Fraser, who has lived all his life in a tiny English hamlet, buried in a remote valley. He is recuperating from an accident, trying to start a novel, and has the solicitous care of a handful of neighbors. But then off-key notes begin to intrude into the harmony of Bewdey. There are odd telephone calls. He feels that

he is being watched . . . practically guarded. And one day, when he has slipped away from his watchers, he meets a strangely dressed girl who has come over the impassable hills in search of a village with quite another name—which she insists is his Bewdey.

About this time the reader is taken behind the scenes, and we discover that Fraser is a secret agent of an English dictatorship some fifty years in our future. He has escaped from behind the Bamboo Curtain, but the secrets he was bringing with him have been erased from his mind in a plane crash. One government faction is trying to dig them out again; another is embedding a synthetic personality in his mind for quite another reason. And in the small group there are at least two concealed agents, one of them trying to kill him.

Some of the earlier parts, in particular, are almost up to the level of "Paper Dolls." The in-the-open section is excellent spy-action stuff, and the double-twist finale is pure SF. Read it.

THE KAR-CHEE REIGN
By Avram Davidson
ROCANNON'S WORLD
By Ursula K. Le Guin • Ace Books, New York • No. G-574 • 138 + 117 pp. • 50¢

You met the Kar-Chee, the gigantic mantis-like scavengers from space who nearly destroyed the Earth, in Avram Davidson's "Rogue Dragon." In that fascinating yarn, the Kar-Chee and their dragons had been all but driven off the planet they were despoiling and a strange stellar feudalism had grown up again with Earth and its dragons as a hunting preserve for off-world lordlings. This short novel takes us back some thousands of years and shows us how men, reduced to savagery, began to rebel against the Kar-Chee reign—how they began to become men again. It is by no means the story "Rogue Dragon" was, but it is full of the qualities that C. S. Lewis extols in his essay, "On Stories," recently reprinted with other essays in "Of Other Worlds" (check your public library: they may not approve of science fiction, but they'll have Lewis). Needless to say, plot and situation are essential to each other: this is not just a Hollywood-type action drama put on in front of a weird stage setting.

On the flip side, a relatively new writer tells another action story about a strange world with strange races. Rocannon was the head of a scientific expedition studying Fomalhaut II when it became an advance base in a suddenly kindling galactic war. He made cause with the natives, or one lot of them, and helped them win back their world for themselves. If you remember back that far, this is the *Planet Stories* kind of yarn, well done, colorful, moving fast, and it's *not* just an action yarn transplanted to another planet.

THE COLD WAR IN BIOLOGY

By Carl C. Lindegren • Planarian Press, Box 644, Ann Arbor, Michigan 48107 • 1966 • 113 pp. • $6.50
Reviewed by Carl A. Larson

Giants girded for combat, thunderbolts of keen-edged arguments between American-Mendelists and Russian-Michurinists? A conflict is presented, its inherent suspense becoming intense when this calm, cool voice bares its anatomy. Tragedy racks heretics, death in Siberia, liquidation by silence. But dissection of a fundamental enigma shows a conflict far deeper than a brawl between East and West.

We meet the trailblazers of Western genetics, and one dissenter. The chromosome theory of heredity crystallizes, the seed of conflict is sown: Morganism-Mendelism tends to play up the gene and the cell nucleus and takes little account of the cytoplasm; Russian-Michurinists and an array of facts disagree. Cytoplasm is essential to life, containing autonomous and self-perpetuating components.

In East and West theories congeal into doctrines; politics and opportunism poison scientists. The gene eludes them, and recent studies of viruses and nucleic acids haven't yielded an acceptable definition of the Mendelian hereditary particle. Cytoplasmic genetics was founded by free European scientists; in its Russian tap it fouls into a belief. The claim by Michurinism, indeed formulated long ago by Luther Burbank—*heredity is the sum of all past environments*—was never substantiated. But Michurinism has exposed weak points of Mendelism and suggested new experiments.

Today biochemical geneticists in East and West do away with old dogmas. But is the new genetics ready for attacks upon fundamental problems? How does life originate? To A. I. Oparin life is the inevitable outcome of complex molecular associations. A shift of emphasis makes such ideas acceptable to Mendelian indoctrination: First comes the gene, which then organizes cytoplasm.

Recent theories of subvital units, *eobionts*, deepen the enigma. Rival theories don't carry beyond this point, that the basic problem concerns self-reproductive units widely different from anything now existing on Earth.

What is life? How did adaptability and inheritability arise? Decades of penetrating research into cytoplasmic inheritance and pioneering mapping of yeast chromosomes have deepened Professor Lindegren's catholic views on these fundamental problems, here presented in a simple, fascinating and piercing way. His plea for tolerance and the exposure of indoctrination will be appreciated by his colleagues. The lucid and readable presentation of problems vital to modern thought will draw much gratitude from lay readers to Professor Lindegren and Planarian Press.

brass tacks

Dear Mr. Campbell:

In reply to Mr. Machan's letter—Brass Tacks July, 1967—you wrote, "Ah, me! the same old problem. Define 'self-defense.' Trouble is, somehow people find that 'my beliefs' become 'part of me' and, therefore, are included in 'self-defense.' "

I assume that by "define 'self-defense' " you mean, "Under what circumstances may we justifiably endanger or take the life of another person in order to defend our person, our property, our honor, or our beliefs?"

To find the answer we must begin with the nature and purpose of government. The purpose of government is to protect life, liberty, and property, and to provide civil courts wherein private disputes may be settled peacefully. Whatever its form, governments are made up of men and not gods, therefore no government may demand more of us than our next door neighbor may demand. Our neighbor may demand three things. These are:

1. Do not deprive me of the use of my body. The government makes this universal and defines murder in varying degrees, manslaughter, assault, rape, slavery, et cetera, and provides police to enforce these laws. But the police can not be at all places all the time, so when a civilian perceives such a crime being committed, whether against another or against himself, he has an absolute right to try to prevent the criminal's completing his crime—even if he must injure or kill the criminal. Once a criminal has left the scene of his crime, his identification,

pursuit, capture and punishment are the exclusive province of the government. A civilian may take part in any of these activities, but only with the knowledge and consent of a duly authorized agent of the government.

2. Do not deprive me of the use of my property. The government makes this universal, and defines theft, robbery, burglary, swindling, arson, vandalism, trespass, et cetera, and provides police to enforce these laws. When a civilian perceives such a felony is being committed, he should make every reasonable effort to contact the police. But, if no policemen are available, a civilian has a right to take whatever steps necessary to prevent the felon's completing his felony—even if it means injuring or killing the felon. Once a felon has left the scene of his felony, the same rule applies as in the case of a criminal leaving the scene of his crime. (Demand 1)

3. Do not injure my personal or professional reputation by telling lies about me. The government provides courts for settling such disputes and defines slander and libel.

We have shown that crimes, being emergency situations with immediate danger to the life of some good citizen, justify one's unhesitatingly taking extreme measures to stop the criminal. We have shown that felonies, being a long-range danger to life, may be handled more cautiously than crimes. Some would deny us the right to use injurious or deadly force against a felon. But we are physical beings and we must have food, and, in our climate, clothing and shelter, to survive. Be it a thief who takes a beggar's last morsel of food, or a mob that loots and burns my home, felons would deny their victims the physical sustenance they must have if they are to live. Therefore, I have the moral right to use injurious, or deadly, force against them. We have shown that no slander, libel, insult or lying accusation can justify the use of injurious or deadly force. Instead the insulted party should sue the slanderer in the civil court and collect such damages, real and punitive, as the court may decree. The code duello, affairs of honor, whatever you call them are criminal nonsense. While one may kill a criminal at the scene of his crime with no compunction, and one may kill a felon as a last resort, and one may sue and punish a slanderer, one may never punish those who attack his beliefs.

Now, if that has not settled those people who find that their beliefs become part of them and, therefore, are included in self-defense, consider this.

I, as is Mr. Machan, am an advocate of pure capitalism, but no possible verbal attack on my belief can justify my seeking to injure, kill or punish such an attacker. I advocate a rational social system, and I must rely on your reasoned understanding and cooperation, not force, to make it work.

Since I demand the right to dis-

agree with statists, I must grant them the right to disagree, nonviolently, with me. But only nonviolently. An advocate of a social system who would use force against those who disagree with him is a criminal.

A murderer is a murderer whether he kills me to get my money, or kills me because I am a capitalist and he is a statist. A slaver is a slaver whether he would whiplash me to get me to pick his cotton, or to get me to bow in his church. A thief is a thief whether he steals my money to spend it on harlots, or to give it to the poor.

So, if you would discuss philosophy with me bring on your editorials, essays, speeches, novels and short stories, and leave your weapons outside. One who uses force to settle philosophical disagreements is a criminal, and should be treated as a criminal. That is, he should be restrained or killed: Not because of his philosophical disagreement but because he is a danger to human life.

WARREN HAWKINS
Route 1
Rotan, Texas 79546

Sorry—still not good enough! Jesus was a criminal, and executed as such —under the theocratic laws of his time-and-place. But Hitler's treatment of the Jews was not criminal; he passed laws that made it legal first. George Washington was a criminal—he revolted against the legal King. Because he won the war, his actions were reclassified as "heroic, patriotic." It's kind of like holding that, in a duel, the loser is dead, proving he was wrong, and, therefore, guilty of attempted murder, while whoever won is declared a blameless non-murderer!

Violence is sometimes necessary, isn't it?

Dear Mr. Campbell:

As a long time reader of Analog, I never thought I would see the day that you would make such an unfair statement, as you did in reply to the lady that claimed to have telepathic talents. (July 1967)

"In a culture that denies telepathy, only the stupid persist in admitting they know by direct experience that it exists!"

It is this kind of narrow-minded thinking that has been responsible for the slow progress of man through the ages. That a man as seemingly intelligent as yourself could believe such a statement, is hard for me to believe.

I have read several books and articles on the subject of parapsychology, and find it hard to believe that the authors are "stupid." While I'm not qualified as an authority in the field, I definitely feel that there is one of the really significant frontiers left open to man. The Rhines, Dr. Puharich, and others in this field of research, may well be the ones remembered in the history books of tomorrow. And you, Mr. Campbell, may also be

remembered, for your STUPID remarks.

JOHN D. BENTON
261 Jules Ave. #61
New Orleans, La. 70121

Tsk! tsk! You don't read accurately! Rhine, Puharich, Tenhaeff and others investigate psi—but DO NOT CLAIM THEY HAVE IT. It's one thing to say "I have evidence it exists," and very different to say "I have the power." The latter group gets clobbered by the society.

Dear John Campbell:

In calling Cinderella's glass slipper the result of the worst blooper of all time ("Target: Language," May issue) Lawrence Perkins has committed an even worse one himself.

The confusion is auditory, not visual, and the word *fourré* doesn't come into it. The slipper was originally made of *vair*—fur—which remains the standard heraldic term for the blue and white field (supposed to represent squirrel skins) used in the blazoning of escutcheons. Phonetically this equates to *verre*, glass. The error wasn't in translation; it was in transcription from an oral source.

Since *vair* is also homonymic with *ver*, worm, and *vers*, line of poetry, I think we can regard ourselves as having got off lightly.

JOHN BRUNNER

Hm-m—I don't think Cinderella would have been popular with the kids if she'd worn wormy slippers!

Dear John:

Just a note to let you know it wasn't all in vain: after "playing" with the government at the National Institutes of Health for the past twelve to eighteen months they have finally come through with a $133 K appropriation for further studies on the "Snakebite" project. I turned this research project over to the Department of Pharmacy, University of Mississippi and they will carry on from there; I'll just be a technical advisor on the team.

Of course in this era of the megabuck giveaway that amount of money doesn't seem like a lot but it's a long way from the one hundred or so dollars spent by Bill in the garage and bedroom laboratory. Thanks a lot for all the publicity given to this work in the article published in Analog in the fall of '65.

ALEX W. HULETT, M.D.
P.O. Box 338
Charleston, Mississippi 38921

A useful result of one Analog article! Snakebite is still a real problem for Western utility company linemen; may the project succeed fully!

Dear Mr. Campbell:

Today in the Sunday supplement in the local newspaper, there is an article that quotes the Gallup poll to the effect that four percent of the population of the United States thinks that they have seen a flying saucer. Extensive research—five minutes with an almanac—has indicated that less than one percent of

the population of the United States has seen the following things in person: (on T.V. or in the newspapers doesn't count; remember Kornbluth's *The Marching Morons?*)

The population explosion
Ho Chi Minh
An Atomic bomb
Russia
Fidel Castro

Since everyone knows that flying saucers are only mass hallucinations, the things named above are at least four times as certain to be mass hallucinations and therefore do not exist. Things are a lot simpler now, aren't they? No doubt there are many other examples of mass hallucinations. How many people have actually seen that the Earth is round?

Yours against superstition,

MARK A. SWANSON

2835 Kimball Avenue
Pomona, California 91767

We can wipe out practically all disease, too! How many have seen a pneumococcus or a flu virus?

Dear John:

I think I see the difficulty in Robert A. Taylor's argument in the May Brass Tacks. He is right to assume that the big bang would produce a spherical shell; however, *this expansion is taking place in four dimensions.* Hence the galactic population will thin only very slowly—as observation confirms—no matter in which direction you look of the conventional three. The radius of expansion is along the Q axis, a direction in which no man hath looked as yet.

If we could, I wonder what we'd see?

JIM BLISH

Part of the problem of observational astronomy always was and will be, "Do we know what we're seeing when we see it?" The Babylonians observed the planets—but didn't know what they saw. Messier observed and cataloged M-31—but didn't know he was looking at an exterior galaxy.

Dear John:

Correction, please, to your editorial in the May issue. At the end of the first column, page 174, you state that the thermal breakdown products of polytetrafluoroethylene are poisonous. That rumor has been floating around for some twenty years, and Du Pont, not surprisingly, has been knocking itself out for all that time to try to find out where it started! Makes housewives afraid of their Teflon lined skillets! As a matter of fact, if you heat Teflon hot enough it just de-polymerizes to C_2F_4, which is physiologically inert. And it takes a *real* temperature to bust *that* stuff up. With oxygen, it would probably go to CF_4 plus CO_2.

As for PVC, I'm afraid that that stuff would show rather depressing fire-resistant properties in an atmosphere of 15 psi of Oxygen. It would last real quick. And so would

epoxy-fiberglass. The thermodynamics favor oxidation, and the low thermal conductivity would make ignition easier—since the initiation energy wouldn't be spread all over the whole structure.

Aren't we lucky that we live on an oxygen rather than a fluorine planet! Then we'd have some *real* problems. I've been working with fluorine at 250°C and 2500 psi, and I know.

Good editorial, though. Anything that can go wrong, will.

JOHN D. CLARK

The datum I got on the polytetrafluoroethylene item was that the Navy first ran into the nasty little problem in their earliest experiments with very long underwater cruises in the nuclear subs. The fluorocarbons are decidedly stable, indeed. Inasmuch as no Teflon-lined frying pan is going to be heated to a bright red heat—at which temperature even Teflon will break down—there's zero point zero zero danger in Teflon cooking utensils.

Du Pont could probably kill that rumor by spreading the information as to what the breakdown conditions are; simply saying "It doesn't happen!" never satisfies a worried —and not too bright—housewife. If instead they said, "Do not melt down this Teflon-lined aluminum pan; at temperatures above the melting point of aluminum, Teflon is apt to break down chemically," they might get the point across.

As I get it, the Navy's problem was that minute traces of fluorocarbon refrigerants—from infinitesimal leakages of freezer units, air conditioners, et cetera—accumulated in the sub's atmosphere over a thirty-day period. In contact with red-hot electric heating elements, and a few open flames, where temperatures were high enough to break the C-F bonds, various exceedingly toxic fluorine products were released. Even parts per million in air which was being repeatedly reused became dangerous.

An electric arc can break down any chemical compound—and that means ANY. Even hafnium carbide will yield to an arc.

I've never tested epoxy fiber glass in 16 psi oxygen, so I can't say whether it would burn—and thermodynamic data doesn't always give the answer directly. Thermodynamically, N_2O_5 is an exothermic compound of oxygen and nitrogen; ergo, air is a combustible mixture!

And if we did live on a fluorine-atmosphere planet—why, several billion years before we evolved, everything that could fluoridate, would have, and our tissues would be as nicely adjusted to free fluorine as they now are to free oxygen. We wouldn't have any worse problems than we have now.

Remember, too, that the O_2-H_4O system is even more corrosive than the F_2-H_2F_2 system, in that it attacks more things, because of the greater ionizing power of H_2O!

IMPOSSIBLE PROBLEM

continued from page 9

Newark is an Insurance city; some of the nation's largest insurance companies have headquarters in the city—immense skyscraper buildings full of filing systems and the analytical and recording organizations that make an insurance company possible. They employ tens of thousands of people.

But they show strong discrimination; they've hired very few of the Southern Rural Negroes that migrated to Newark in the last two decades. Except, of course, as janitors, cleaners, and such unskilled jobs.

Because, of course, the Southern Rural Negroes who came to Newark are unskilled and undereducated and simply cannot do the work that requires rapid reading with full comprehension, quick grasp of figures, understanding of mathematics, and other high-order skills. An insurance company *can't* use unskilled labor—and most of those immigrants were unskilled manual laborers without much education, and an earnest desire to avoid any more.

The insurance companies discriminated against all people who weren't fast, accurate typists, readers, and file workers—and since the Southern Negroes fell into that unskilled group, there was a de facto segregation. All due to de facto those Negroes couldn't do the needed work.

During those two decades, industrial employment in our cities has been steadily declining—and is continuing to do so. A number of factors have contributed to this, but among the major ones are the increase in Welfare payments, and Union resistance to automation.

The money for Welfare payments comes from "the guv'munt," and the "guv'munt" has all the money it wants, of course, and they should give poor people more money.

But unfortunately the "guv'munt" gets its money by extracting it from somebody who has some. Like industrial corporations, because corporations, while legally persons, don't have the right to vote—and Welfare recipients do. New York City's efforts to extract more and still more money from the Stock Exchange very nearly resulted in the Exchange moving out of the city. So many stock transactions did move out of the highly taxed New York area that the increase in taxes led to an actual decrease in revenue; customers were simply telephoning to brokers in Boston, Chicago or San Francisco. You can't stick much of a tax burden on something so highly mobile as stock transactions without having it just decide to go somewhere else.

Industry also can move. Move out from under local income taxes, business taxes, real estate taxes—all forms of local taxation.

As Welfare costs went up, local taxes soared—and industries soared up, up and away, too. They moved out into open country in "industrial parks" or simply built up communities of their own.

Another force was at work, also—the Unions' bitter and intransigent opposition to increased efficiency of operation, whether by automation, or simply new and more efficient operation methods. One of the best examples is the destruction of nearly all New York City's newspapers by the various newspaper unions demanding with absolute and iron-stubborn intransigence that they retain their ancient privileges, and get huge boosts in wages. They imposed a wage structure that brings a New York City linotype operator an annual wage about fifty per cent higher than the average medical doctor—and featherbedded that further by rules typified by the handsetting of the New York Stock Market reports.

If there's anything that should be set electronically, obviously such purely tabular material as the stock reports should be. A computer-controlled typesetting machine could produce flawless copy, and do it far faster than a hand-run operation.

But no! Each separate newspaper in New York had to have linotypists setting those columns and columns of type, proofreaders checking all the galleys, and then more typesetting to make corrections.

New York used to be a great center of the printing industry. It isn't any more.

The big-city newspapers are dying off rapidly. In the small cities and towns all over the country, the newspaper business is flourishing; it's futile to blame the fall-off in the cities on radio and TV.

Cities grew originally as centers of transportation—at river mouths, at a pass through a mountain range, some place where there were great transportation advantages. Now, with road, rail and air transport, the old city spots aren't so crucial. Cities are so choked with transportation bottlenecks that dispersed towns are more desirable. Workers can live in pleasant surroundings without having to commute twenty-thirty—even fifty miles. The industries find far lower taxes, cheaper land, and escape from the Welfare burden of the cities.

An industry in a city, burdened with rising taxes, and intransigent local unions that absolutely refuse to permit more efficient operation or automation—simply gives up and quits completely. They shut down their city factory, sell it if they can, or let the city take it for taxes, and build a wholly new plant in some different area.

The loss of that industry increases unemployment, which increases Relief and Welfare costs—and it is one less source of tax revenue, which puts increased tax burdens on the remaining industries.

And this is what generates the Negro complaint that the city administration won't listen to them—just won't pay attention to their problems and their miseries.

Of course the city administration won't listen to them. The city knows all about that set of problems; they have known about them for ten years. They know the unemployed are unemployed; they know the housing is bad and getting worse. (The landlords can't charge rents that would pay the ultra-high-priced union workmen to maintain and repair the buildings, and pay the high real estate taxes. After all, it's the real estate tax that supplies the money for the Welfare checks the slum dweller is paying the rent with.) They know, and have known, that there's an acute shortage of low-cost housing. And they know the shortage will simply grow worse, because these days who ever heard of low-cost construction?

Sure enough; those nasty city officials just won't listen.

How many thousand times do you have to be told something before you know it exists?

What the complainers really mean is: "They won't do what we want!"

False statement.

True statement: They *can't do* what is wanted.

It's the complainer who won't listen, who won't believe that the economic problems really exist, that it's impossible to supply him with a job when the industries have moved out of the cities. That Welfare can't be increased, because the cities are already on the verge of bankruptcy—and, in many cases, actually over the verge, and are being supported by state funds.

This the complainers won't listen to, because they simply don't want it true.

And so, all over the nation, they chant: "They won't listen to us! They won't consider our misery and our problems!"

They are acting precisely like a child who wants Daddy to give him that bright, shiny pretty Moon up there, and Daddy won't do it. So Junior pesters and demands and nags to make Daddy give him what he wants, but Daddy just won't listen. And presently Junior throws a tantrum and howls and smashes things.

The one thing he won't do is listen to Daddy's explanation that he *can't* give him the Moon. That isn't the answer Junior wants, so he won't consider it; he howls louder, and kicks and screams and smashes things—but he does *not* consider the idea that Daddy understands exactly what he wants, fully appreciates his problem, and has a problem himself that makes it impossible.

The riots are the tantrum-riots of a willful group of people who want what they want and aren't going to listen to any answer that isn't what they want.

In Newark, where the Negroes constitute sixty per cent of the population, they complain they are segregated in a ghetto—which is nonsense, since they, not the Whites, are the majority. They don't like the administration—but won't take the responsibility of operating the city themselves. If they did, then instead of complaining about what they didn't like, they'd be responsible for fixing it themselves.

One of the underlying roots of the national problem is the exceedingly dangerous false pseudo-logic that goes, in essence, like this:

1. What I want is something I need—*want* equals *need*.

2. What I need I have a right to.

3. What I have a right to, Justice would provide me with. Therefore, if I want something and it isn't given me, that is plain injustice and I have a right to take it.

In other words, "Whatever I want, I have a right to take, because it should be given me."

This false philosophy has been encouraged by various assorted demagogues of various assorted colors.

The hard and inescapable fact of the Universe is that (1) what you need, you do *not* automatically have a right to. You have a right to it only if you earn it. (2) There is no correlation between "want" and "need"; a child with a toothache *needs* dentistry, but *wants* escape. (3) Justice is a human concept—and varies with individuals, cul-

tures, and time. The Universe has only regular, predictable laws. If a child, out of ignorance, upsets a pan of boiling water from the stove onto himself, the lethal scald it gets may not be justice, but it is perfectly predictable.

The rioters, by blackmailing the cities into granting their impossible demands, are hastening the collapse of the cities.

The city administration of Newark was wise—in long-term values—in planning to build that hospital where the densest slum area is; the Negroes were perfectly correct in saying the city was trying to drive them out.

They have to move out—go back to rural areas where the abilities they have for unskilled and uneducated labor can be used, as it cannot in the cities. Go out into the country, where the light industries have already gone. Get off the city Relief and Welfare rolls, so the foundering city can avoid raising taxes and thus speeding the flight of remaining industry.

The complainers want something that they simply cannot possibly have; it can't be done.

They want more adequate Relief payments, and better schools, and more public low-rent housing, where the rents are fair. "Fair" in this sense meaning, approximately, "a four-room apartment in a good, modern building, well maintained and cleaned, with all utilities supplied, for forty dollars a month." And they want it now; they're tired of waiting.

And they're going to riot and throw tantrums and howl about their injustices until the Fairy Godmother and her Magic Wand comes along and gives it to them.

Because certainly no human power can.

For human beings, those demands are an impossible problem. And making them listen-to-and-consider the facts is a second impossible problem; they don't want to listen. They don't want understanding of why they can't have it; they want it!

Incidentally, if the Negro majority in Newark elected and installed a Negro administration pledged to do things the way the Negroes wanted—they wouldn't do it, of course, because the Negro administration wouldn't have any better Magic Wand than a White administration. But they'd have a better excuse; they'd suddenly discover that all the trouble was because the White Power Structure of the state was refusing to bail them out of bankruptcy, and thus defeating their efforts.

It's always so much more satisfying to say: "*He* won't let me!" than to acknowledge: "This can't be done the way I wanted to."

The impossible problem is, simply, that Second Law of Thermodynamics: You can't get something for nothing.

The Editor.

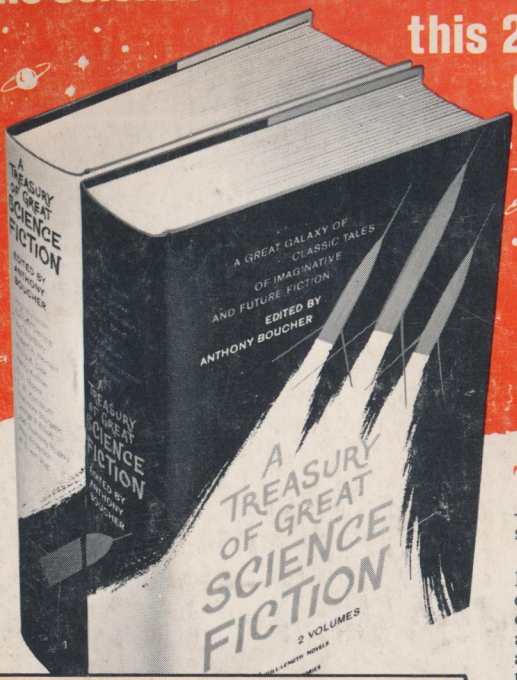
Buy Bonds where you work. They do.

Over 90% of the 101st Airborne Division's 1st Brigade has signed up for U.S. Savings Bonds through the Payroll Savings Plan. That's what their Minute Man flag signifies. These men, now in Vietnam, deserve your support. When you purchase Savings Bonds regularly, you show the men of the 1st Brigade you're with them. And you walk a bit taller.

Buy U. S. Savings Bonds

The Science Fiction Book Club invites you to take this 2-volume Treasury of Great Science Fiction *for only* 10¢

when you join the Science Fiction Book Club and agree to accept only 4 books during the coming year.



A TREASURY OF GREAT SCIENCE FICTION
Edited by Anthony Boucher

Two giant volumes. Over 1000 pages of exciting fiction. A handsome addition to your library. Includes John Wyndham's classic **Re-Birth** . . . Heinlein's **Waldo** . . . Anderson's **Brain Wave** . . . a total of 4 full-length novels, 12 novelets, 3 short stories by such masters as Bradbury, Arthur Clarke, Judith Merril, Alfred Bester, A. E. Van Vogt, C. M. Kornbluth, Theodore Sturgeon — and more.

TAKE this 2-volume Treasury of Great Science Fiction — a "must" for any S-F fan — for only 10¢ . . . with a short trial membership in the Science Fiction Book Club.

How to Get This Unusual Value

Because you enjoy Science thrillers, the Science Fiction Book Club would like to acquaint you with the most imaginative, informative, entertaining new science fiction books as they are written. That is why we have arranged to send you this 1000-page Treasury of Great Science Fiction for only 10¢, plus shipping and handling, with a Trial Membership in the Club.

Here's how the Club works: each month it offers a really superb new science fact or fiction book at a fraction of its regular price. Even though these books sell for $4.95, $5.95 and more in their original editions, Club members get them FOR ONLY $1.49 EACH — in special full-length, hard-cover editions. Extra-value books cost more. And the Club tells you in advance what each monthly selection will be. During your Trial Subscription you agree to take as few as four books in the next twelve months. After that you may take as few or as many books as you want, and you may cancel at any time.

Money Back Guarantee

Send for your big introductory package today. After ten days, if you are NOT delighted, return the books and your membership will be canceled. Otherwise you will be enrolled in the Club as a Trial Member, and you need take only four books in the next twelve months. Mail the coupon today to: Science Fiction Book Club, Garden City, New York 11530.

SCIENCE FICTION BOOK CLUB
Dept. 7N-AEX, Garden City, N.Y. 11530

Please enroll me* as a trial member in the Science Fiction Book Club and rush me The Treasury of Great Science Fiction. I enclose 10¢ to help cover shipping and handling. Then, every month, send me the Club's free bulletin, "Things to Come," which describes coming selections. For each book I accept, I will pay only $1.49, plus shipping and handling, unless I take an extra-value selection at a higher price. I need take only four books within a year and may resign at any time thereafter.

NO-RISK GUARANTEE: If not delighted with my introductory package, I may return it in 10 days, pay nothing, owe nothing, and my membership will be canceled.

Name_____

Address_____

City_____ State_____ Zip_____

If under 18, parent must sign here (Offer good in U.S.A. only.)

*Membership applications are subject to acceptance by the Club.

23-S73