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A Calendar of Upcoming Events

April 8-April 11, 1975:
Institute of Electrical and Electronics Engineers International Convention and Exposition at New York City. Info: IEEE, 345 East 47 Street, New York City 10017.

April 9, 1975:
European Participation in Earth Resources (Space) Projects (British Interplanetary Society) at London, England. Info: Executive Secretary, BIS, 12 Bessborough Gardens, London SW1V 2JJ, England.

April 18-April 20, 1975:
MINICON 10 (Minnesota Regional SF Conference) at Minneapolis, Minnesota. Guest of Honor, Poul Anderson. Info: Bev Swanson, 2301 Elliot Avenue, S., Minneapolis, Minnesota 55404.

April 18-April 20, 1975:
LUNACON 75 (New York Regional SF Conference) at Commodore Hotel, New York City. Registration: $3 in advance, $5 at door. Info: Walt Cole, 1171 East 8 Street, Brooklyn, New York 11230.

Spring, 1975:
KUBLA KHAN KHUBED at Nashville, Tennessee (exact date not known at press time). Guest of Honor, Andrew J. Offutt. Master of Ceremonies, Frank Kelly Freas. Info: Ken Moore, 647 Devon Drive, Nashville, Tennessee 37220.

August 14-August 17, 1975:
AUSSIECON 75 (33rd World Science Fiction Convention) at Southern Cross Hotel, Melbourne, Australia. Guest of Honor, Ursula K. LeGuin. Fan Guests of Honor, Mike Glicksohn and Susan Wood. Info: Box 4039, Melbourne 3001 Australia. US Agents: Jack Chalker, 5111 Liberty Heights Avenue, Baltimore, Maryland 21207, or Fred Patten, 11863 W. Jefferson Boulevard, #1, Culver City, California 90230. Canadian Agent: John Millard, 86 Broadway Avenue, Apt. 18, Toronto M4P 1T4 Ontario. Registration: $12 attending, $4 supporting.

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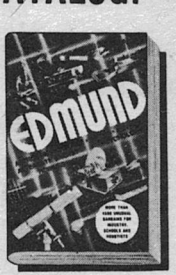

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SPECIAL FEATURE

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In place of our usual Editorial we present two strong and opposing views about the impending National Health Insurance law. F. Paul Wilson and Alan E. Nourse are both physicians as well as widely-known science fiction writers.—The Editor

DEBATE: NATIONAL HEALTH INSURANCE

F. PAUL WILSON: And Now, From the People Who Brought You Vietnam and Watergate . . .

. . . health care.

The men and women, elected and otherwise, who run our government have decided to overhaul the way health care is delivered in this country. Having demonstrated over the past decade and a half their expertise in foreign relations, political ethics and economic management, they have somehow come to the conclusion that their talents are needed in the field of medicine. After all, there is a health care crisis in the United States, isn't there?

continued on the next page

ALAN E. NOURSE: When Somebody Hands You a Lemon . . .

. . . make lemonade.

Some form of National Health Insurance, organized and controlled by our Federal Government, is on its way—this year, next year or very soon thereafter—as surely as night follows day. Dr. Wilson is worried about it. So am I—for rather different reasons. I believe that a massive overhaul in the way health care is delivered in this country has been due and overdue for a long, long time. Thanks to the vast majority of our doctors, with their medical organizations and their

continued on page 174

There is if you read the major wire services or the *Times* or the *Post,* or watch the news and special reports on CBS and NBC, or listen to politicians like Kennedy and Mills, *et al.* These information dispensers and opinion-makers have so efficiently inundated the mass media with negative medical propaganda over the past few years that fully 75 percent of the people in this country are convinced that they are in the middle of a health care crisis.

However, in a University of Chicago national probability sample poll which asked, "Are you dissatisfied with your own health care?", the affirmative response amounted to a mere 10 percent.

In no conceivable analysis of these percentages can one honestly construe a groundswell of public opinion behind the words and actions of our elected officials.

Statistics are boring, but there's quite a contrast between what is being disseminated through the media and what is really going on. For instance, we're told that health care is not sufficiently available to the people under the auspices of the current chaotic private non-system. But 90 percent of the population feels satisfied with the non-system that has put a doctor 17 minutes from the average doorstep and somehow manages to see 2,300,000 patients a day (over 50,000 of those through house calls!). And as for emergency rooms, the average wait is less than 29 minutes with an appointment and less than 37 minutes without.

So much for availability. On to those frightening mortality figures. Our political leaders and editorialists seem to take great relish in telling us that the United States ranks number 22 in life expectancy for men; but they neglect to fill you in on the fact that a staggering number of us die from causes unrelated to disease. In fact, accidents are the most common cause of death through middle age in the United States—50,000 of us are done in yearly on our highways alone; add to that the deaths from personal violence, accidents around the home and work-related trauma and you've shortened the lives of a sizable number of Americans without the help of disease.

The infant mortality issue carries the same brand of misrepresentation even further. The favorite ploy is to take statistics from countries that are relatively genetically homogenous and compare them disparagingly to the US melting pot. But if you look at a genetic mixture of European countries along with another melting pot called the USSR—nearly all of which have some form of government controlled medicine—the results are quite edifying:

	Infant deaths/1000
USSR	28.0
European Free Trade Association	22.5
Common Market Countries	21.6
United States of America	19.8

The death of even one potentially rational human mind is, of course, one too many; but the figures show

that government programs do nothing to improve the situation.

The cost of health care in America, however, seems to be the most overburdened issue. We're told that medical costs rose 50 percent in the decade between 1960 and 1970. But no one mentions that this rise compares favorably with the rise in cost of other services over the same period; nor is it mentioned that it was during this period that intensive care units and coronary care units came into their own and medical technological sophistication advanced at an unprecedented rate. And of course the politicians are loath to remind the consumer that the decade in question was the one in which the Federal Government made its first intrusion on private medicine (Medicare and Medicaid became law in 1965) for an obvious reason: some savvy voters might infer a cause-effect relationship.

Health care, like any other service, is expensive. There's no getting around that, despite a recent Louis Harris poll showing that the average American family spends $133 a year on health care, less than the average car annually burns up in gasoline. But don't expect a government National Health Insurance plan (NHI) to cut that cost. A Rand Corporation survey estimates that NHI will *add* up to 16 million dollars a year to health care expenditures. The money will have to come from somewhere, either from increased taxes (which leave you less to spend on other things) or increased deficit spending (which ultimately makes what you have worth less) or both.

In spite of this, most Americans, if pressed, will say that they wouldn't mind seeing the US adopt a program of free medical care similar to the one in England.

The key word here, of course, is *free*.

OK, the government pays for it, but Heinlein's acronym, TANSTAAFL, is never truer than when applied to government action. Governments produce no income; they can only appropriate money from productive individuals, run it through a bureaucratic grinder and return but a small fraction to those who earned it. No government has ever truly saved its citizens money by getting involved in health care.

England is a good case in point. The famous British National Health Service, when inaugurated, estimated its annual cost at 170 million pounds. Expenditures are now running at 2.6 *billion* pounds a year.

Why the incredible overrun? Besides the usual mismanagement, duplication of effort and blatant wastage that attends any bureaucratic endeavor, the primary reason is overutilization—an inevitability once the financial link between a consumer and a commodity or service is removed. Everyone wants to "get his due" and consequently there are waiting lists, some years long, for elective surgery. The uncomplicated inguinal hernia, nose job, cataract, et cetera, is forced to wait until space is available. So patients are sent scurrying around the countryside looking for empty hospital beds and available surgeons.

Outpatient care is even more chaotic. Patients who are genuinely ill are crammed into crowded waiting rooms for hours alongside hordes of malingerers looking for a sick slip for work, hypochondriacs in for one of their thrice-weekly visits, lonely senior citizens with nothing better to do, people with minor complaints that would formerly have been handled by over-the-counter preparations (but which, under the British system, can be had for a fraction of the cost if prescribed by a physician) while the doctor in the back rips through twenty patients an hour.

It's hardly surprising that Prime Minister Wilson, long a vocal supporter of the National Health Service, has a private, non-participating physician to tend to his own health needs.

The vaunted Swedish system is no better. There are some 15,000 people on waiting lists in Stockholm alone. It can take three years to get a gallbladder to the operating table and a patient can look forward to a seven-year wait for plastic work. There's even a wait of nearly a year and a half to get a hearing-aid repaired!

And the above is only a small part of the price Americans will be forced to pay for "free" medical care. One of the grimmest portents of things to come can be found in Senator Bennett's amendment to the 1972 Social Security Act which calls for the establishment of "Professional Standards Review Organizations" (PSRO). As explained to the public, PSRO boards will be composed of local physicians who will monitor hospital admissions of patients participating in government programs (this means Medicare and Medicaid now, but will cover virtually all US citizens under NHI) to guard against unnecessary procedures and to insure that patient care meets certain standards.

Sounds reasonable, doesn't it?

What you're not told is that the law provides for the establishment of regional and national codes of health care to which physicians and patients will be subject.

For instance: Assuming no complications, a patient will be allowed "x" number of days in a hospital for gallbladder surgery and no more. A local PSRO board of physician-bureaucrats (made up primarily of doctors who are either retired or couldn't make it in practice) will consult the code book and send the patient home on day "x" despite the protestations of the attending physician who knows that she has five children and will not be able to convalesce properly at home. Two extra days as an inpatient could make a significant difference as far as wound healing is concerned. But the board doesn't know the patient; it knows only what the code book of regional standards says.

The local PSRO board is also empowered to block a patient's admission to a health care facility if the case does not meet certain norms. Appeals can be made, of course, but a favorable decision might come too late.

If complications should ensue—wound dehiscence from an early

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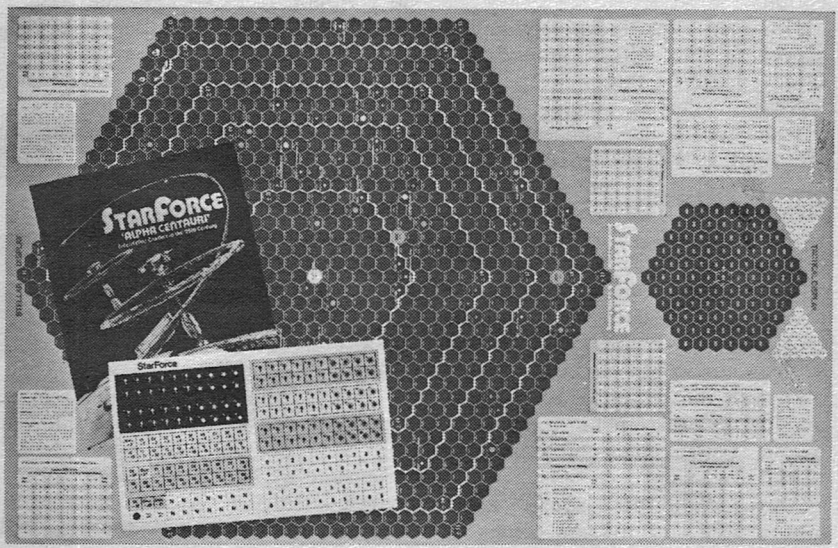

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discharge or death from a denied admission—the patient or his family must grin and bear it. The Federal Government has anticipated such occurrences and has made PSRO members immune from prosecution.

However, the most frightening aspect of the PSRO amendment (and remember: this is not pending legislature—this is already law) is that it gives the local boards, which are funded by and answerable to the Federal Government via the Department of HEW, the right to inspect a physician's medical records. What has been traditionally privileged information is now available to local, regional and Federal PSRO boards. Records that a physician would formerly release only with the patient's written permission are now up for grabs without the benefit of a court order or a search warrant.

Thus a "plumber's squad" is no longer necessary to gain access to the medical records of someone like Daniel Ellsberg—all that's needed is a little pressure on the local PSRO board.

Another Louis Harris poll demonstrated that of all professions and institutions, medicine ranks *first* in the confidence of American citizens; politicians place a poor *last*. On those terms alone, the Bennett PSRO amendment is a blatant absurdity: the institution last in public confidence has arrogantly and unilaterally decided to police the first in public confidence, purportedly for the public good.

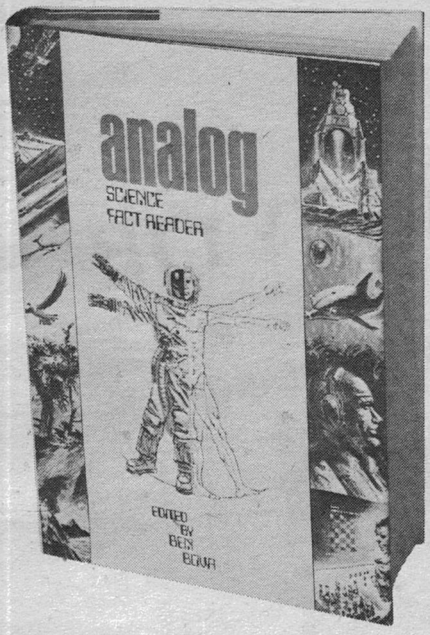
There is most certainly a health care crisis in America. Not the one propagated by members of Congress and their mouthpieces in the media in a startling modern day vindication of Goebbels' thesis that if a big lie is repeated often enough, it soon becomes accepted as common fact. No, the true crisis is the threatened intrusion of brazen and ludicrously unqualified bureaucratic minds upon a vital area of human endeavor that has historically served, and is currently serving, the health needs of this country with efficiency, privacy and compassion.

Remembering that the poor and the elderly are already covered by Medicare and Medicaid (so don't get taken in by tales of destitute people wracked by disease—programs are available to pay for *all* of their health care expenses), the American consumer must ask himself what he will gain by further extension of the government into private medicine. Answer: nothing. A glance at the European experience and at the PSRO law amply shows what he stands to lose.

Another question: Is there any way NHI can be stopped? Only one—all physicians and hospitals in this country must unite, refuse to participate in the plan and repudiate the validity of PSRO authority over their patients and their medical records.

But now we're into speculative fiction. Doctors are a maverick breed and notoriously unorganized; the AMA, which is run by the same breed who will volunteer for PSRO positions, has virtually jumped on the NHI bandwagon

continued on page 174



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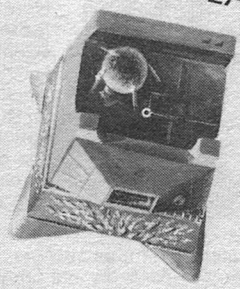


RICK STERNBACH

"It's peculiar stuff, Venusian oil," said Commander Stephen Redwood of the United European Space Service. "Quite useless until you examine it closely, then you discover its staggering potential. Modify it, combine it with Moon-dust, and you get a super-fertile nutrient sludge which could revolutionize hydroponic farming on the Moon and halve the cost of supplying our colonies there. Moon Dome One would be saved from the chopper." Redwood smiled. "Modify the oil still more, eliminate the poisons, and in an emergency you could eat it direct, and thrive."

"Ugh! Revolting." Dr. Christopher Collins, the geologist, wrinkled his nose in distaste, then said, "How about Mars? Word's going round that the stuff could make our settlements there into permanent going concerns."

"Possibly. The same goes for the satellites of the outer planets . . . Provided our present mission's a success. Things are going wrong. We've got to find out what, and why, and whether in future we can suck the oil out of the crust without getting killed."

Redwood fell silent. He was a tall, gangling man with rust-colored hair and a face which looked as though made of mismatched parts slapped together in a hurry. Even in his trim gray Space Service uniform he gave an impression of casual untidiness—a false impression; he was a highly skilled pilot and the leader of many surface missions.

Collins looked from Redwood to the others seated in the briefing-room of Venus Orbital Station Two. He was curious about these people, his companions-to-be on the surface: Heinrich Schultz, engineer, a chunkily built German with square hands, a square head and curly blond hair; Andrew Davidson, chemist and an expert on Venusian oil, an aging man whose leathery brown face was separated from his leathery brown pate by a halo of white fluff; Ian Tanner, navigator, young and lithe, fresh from Space Academy and still awed by the immensity of the universe.

Also Katherine Harrer, meteorologist. She was a veteran of Venus. She had worked aboard Station One until design faults had forced its abandonment. As soon as Station Two had been completed, she had wangled inclusion among its personnel in order to continue her examination of the atmosphere. Apart from brief leaves, she had been here for three years, Collins estimated. His glance flicked over her and away again quickly.

Collins said to Redwood, "You've had two disasters, haven't you, both of them connected with the oil?"

Redwood nodded. "The first was the destruction of the drilling complex. Its work force had sent us the only really large oil sample ever

obtained. We've had small samples, of course, brought up by the exploration scaphe from different regions. By the way, one of our biggest mysteries is how the oil formed in the first place. There's nothing like it anywhere else in the Solar System."

"As far as we know," put in Davidson, who had supervised the samples' preliminary analyses in the laboratories of Orbital Station Two, before releasing them as biologically safe for full investigation on Earth. "The stuff shouldn't exist at all," he continued. "There's no chemical way it could have come into being—at least, that we can think of. Yet it's not of organic origin, that's for sure."

Collins agreed. Venus was a dead world. Always had been. The heat-trapping effect of its dense, predominantly carbon dioxide atmosphere had seen to that. Cloud-smothered, dust-choked, glowing like an ember in places, it was the hell-hole of the Solar System—but a hell-hole rich in the oil that the Moon so urgently needed; therefore one which mankind was determined to exploit.

Redwood crossed his ankle over his knee. "The drilling complex was sited near the edge of a rough plain," he said. "The plain is built up from sedimentary layers which were formed from sand and dust deposited by the wind when the plain was depressed into a basin; they were compacted into rock by eons of heat and pressure. The oil is present in the lowest porous layer. And that's another mystery: crazy oil has no business to collect in such a geologically unlikely region, yet that's where the richest deposit has been found to date."

Collins tipped his head. He was a wiry little man, quick-moving and agile, with bright sharp eyes almost the same sandy color as his hair. Even at rest he gave the impression of being poised for flight. "Crazy oil?" he queried.

"Quasi-oil: like oil but not oil." Redwood's knobby face creased in a grin. "And with crazy properties! You can see how it got its nickname."

"I can indeed," said Collins. "I was briefed before I left Europe. It seems that the complex was ruptured by oil which forced its way up the borehole, not long after the large sample had been sent aloft. How it happened no one knows; precautions had been taken to prevent just such an accident. Yet it did happen, and without warning. There were no survivors."

"Quite right." Redwood's face became grim. "One of the scientists was broadcasting a progress report at the time. We mounted a rescue mission straight away. We were far too late. Oil had smashed through the complex. When it receded, Venus' atmosphere burst in with the force of an explosion. The men must have died almost instantly, crushed and fried to cinders. We

had to scrape them off the floor."

Collins glanced at Katherine askance; his expression baffled Redwood. It seemed as though the geologist viewed the woman as an unknown and unwelcome liability. Yet, according to Redwood's information, they had worked together successfully in the past, on Earth.

But this was not Earth; this was a space station, remote, enclosed, ingrown. There was a big snag with mixed personnel in such an environment: sex reared its head and bang went efficiency.

Collins was unmarried, Redwood recalled. So was Katherine. Unfortunate. A good marriage acted as an anchor; it gave stability.

Not that Redwood disapproved of Katherine's presence; it brightened up Station Two very nicely indeed. Katherine possessed that alluring combination, an attractively feminine manner plus a first-class brain. Maturity—she was in her early thirties—had taught her sexual sophistication, and had spiced it with a challenging assurance in her dealings with her male colleagues.

And she was pleasing to look at: an urchin-faced brunette, solid yet graceful, her rounded contours all the more exciting for being half concealed beneath black slacks and a loose blue workshirt. Dark eyes, dark glossy hair caught back in a pony-tail to hold it out of her way, skin smooth and clear with a pale tan sheen: they suggested a Mediterranean houri rather than a northern ice-maiden.

Redwood preferred houris. He liked a woman to look like a woman, not like a boy gone wrong.

Schultz, the engineer, leaned earnestly toward Collins. "When we'd recovered as much as possible of the dead—I took part in the rescue mission, you understand, *Herr Doktor*—we capped the borehole and tried to reconstruct the disaster. Strange things we found, certain"—Schultz moved hands like spades as though groping in the air for the correct word—"anomalies. May I give one example? Oil had stuck to the ceilings, showing that it had been present in considerable quantities. Yet it had soaked into the ground over only a very small area, immediately surrounding the complex. Odd, not so?"

"Very," agreed Collins. "Did you discover where the bulk of the oil had gone?"

"Back down the borehole."

"Impossible."

"You think so?" Davidson cut in drily. "Our second disaster was weirder still."

"The research unit, you mean?" said Collins.

"Yup. Now there you have oil which came out of nowhere, wreaked havoc, and returned to nowhere."

"The people down there never knew what hit them. Nor did we, at first." That was Ian Tanner, adding his bit. Schultz began to speak

again. Davidson interrupted. The discussion blossomed into a free-for-all.

Redwood clamped down. "Again the rescue mission arrived too late to save any lives," he said. His voice rode over the babble, quelling it with ease. "The research people were investigating the tapping of magmatic heat to provide power. Oil irrupted into the unit, punched it wide open to the atmosphere, and vanished God knows where."

Collins said slowly, "Oil-bearing strata must exist near where the unit was sited. The investigations must have disturbed them." His briefing had denied this, but since then new factors had surely come to light.

Redwood axed his hopes. "No. The whole region has been studied pretty thoroughly. The nearest oil-bearing strata are under the plain where the drilling complex was destroyed."

"And that," said Tanner, "is four hundred miles away."

"We can think of only one explanation," Davidson added. "The oil travels. No one can find out how or why. I'm supposed to be an authority on the bizarre muck, but I confess I'm mystified."

Schultz said in his perfect though ponderous English, "Unfortunately our senior geologists are dead. Likewise our senior engineers. They were down on the surface. So was much of our equipment."

Katherine spoke for the first time: "That's why Headquarters sent you, Chris; plus replacements for the gear wrecked by the oil." She pulled a glum face. "Not nearly enough to make good our losses. We must economize, so says the Minister for Extraterrestrial Affairs. Long before the first disaster we'd overspent our budget."

Redwood looked at Katherine: she was as cool and competent as usual. He looked at Collins: the geologist was listening politely, but with eyes opaque as though withholding their sight.

Redwood's misgivings stirred more strongly.

Collins turned to the window. The Station was stabilized in a low orbit. A few miles down, the lacy topmost layer of the sulphuric acid clouds glided swiftly along, feathering and writhing, glaringly white against the star-jewelled darkness of space.

Collins stared, visualizing the planet hidden below: a planet of night and twilight, where asphalt pits bubbled in ash-pale deserts; a planet of eroded mountain-chains, of smoking volcanoes, of cauterized depressions which on Earth would have cradled oceans.

Tomorrow, Earth-time, weather permitting, Collins would descend to that hideous world; his job, to continue the oil investigation which the dead men had begun. He and his companions would live inside the exploration scaphe, an all-pur-

pose vehicle, cuboid in shape, fashioned from dully gleaming alloys. Packed with equipment, powered for flight by gravity neutralizing engines, the scaphe was designed to cope with all that Venus could hurl at it: crushing pressure, searing heat, sand-blasting by constant gales, acid fogs, lightning bolts.

And oil, crazy oil which could travel, ruin, kill?

Collins watched the cloud-race boiling below, and shivered.

The flight cabin of the scaphe looked like a metal and neoglass jungle to the uninitiated eye. The walls were covered with instrument banks. The nose contained a large adapter screen into which Commander Redwood peered intently as he gentled the unwieldy vehicle down through the atmosphere.

In the chair beside Redwood's Davidson slouched. The aging chemist, a versatile jack-of-all-trades, was doubling as copilot. Absently he chewed on a beheaded match-stick, rolling it between teeth too chipped and discolored not to be his own.

Behind them Tanner sat at a chart-covered table, a compass at his elbow. From time to time he broke into a low, tuneless whistling as he plotted the scaphe's course.

At the rear of the cabin, Katherine kept close watch on a panel of meteorological instruments, struggling to anticipate the murderous tricks of the Venusian weather.

An alcove contained the computer readout station. Methodically Schultz sifted the data displayed there, supervising the behavior of the engines two decks below.

Collins alone was inactive. He sat with his thumbs hitched into the pockets of his white overall, and watched the adapter screen with interest. Rising to meet them, very slowly, was a corroded landscape, strangely somber and shadowless under a bloated sun which squatted sullenly in a bilious sky. Somewhere among those scorched wastes lay their destination.

Beside the screen was a neoglass window, its shutter tightly closed.

Collins eyed the back of Redwood's head. "Commander, do you ever fly with the window unshuttered?"

"Occasionally, when we're carrying a team of meteorologists researching the atmosphere," Redwood answered. "They need to see things as they really are, not prettied up."

Collins frowned at the adapter screen. He knew that its picture was built from information gathered by the scaphe's sensors and processed through a computer. One sensor was linked to apparatus which amplified the dull light penetrating the multilayered overcast. Other devices bounced echoes off solid objects invisible through the particle-laden air. A system of lenses compensated for the optical distortions caused by the atmo-

spheric density, which near the surface was extreme enough to bend light.

Bend light? Refraction was such that, were the air sufficiently transparent, the entire surface of Venus would appear to rise towering all around them, as though the planet had been skinned and the skin pulled inside out.

Curiosity pricked like a goad. Collins said, "Commander, I'd like very much to see out. Would it confuse you to fly with the shutter open?"

"No," replied Redwood. "I'm used to it." He pressed a button on the control-board which ran the length of the wall below the screen. The shutter slid sideways into its groove, disclosing a golden maelstrom shot with skeins of russet and bronze.

Lower they dropped, and lower. The gold darkened to tarnished copper. Slowly, slowly, they sank into a sea of soup.

They broke through the cloud-base. A nightmare world engulfed them, looming dimly through crimson smog as though viewed through a ruby prism. Suppressing a surge of excitement, Collins rose from his seat, moved forward to see more widely.

The jumbled stonescape immediately below the scaphe was close enough to be free of gross optical distortion; but, as his gaze traveled further afield, all shapes melted and ran like wax in an oven, growing ever more formless and disproportionately magnified. There was no horizon, only a slithering chaos which climbed steeply into a weird and menacing sky. The scaphe was trapped in the bottom of a vast, collapsing pit.

Collins found himself battling with vertigo. He looked at the adapter screen. It showed the superheated plain sprawling away to a flat horizon, streaked here and there with veins of dusky red.

"Safety-harness, please," said Redwood.

The five men and Katherine fastened themselves into their seats. Davidson slipped his chewed match-stick into a workshirt pocket, checked the row of small screens which formed part of the scaphe's internal telescan system. To Redwood he said crisply, "All's well everywhere, sir, so far as I can tell."

The scaphe nosed downward, bucking turbulent thermals. Fractured crags crept beneath, gnawed to grotesque stumps by the fierce wind generated by the planet's retrograde rotation. One such stump swelled into a brief stretch of cliff; in its lee the drilling complex had been sited.

The scaphe lumbered low over the ruins. Canting sharply, it pulled into the shelter of the cliff. Sluggish despite the Commander's deft handling, it touched down the only way possible in Venus' conditions: a calculated crash-landing which

ended in a jarring thump. The thump was dead on target.

Redwood thrust the controls into neutral, shut off the engines. There was no need for gravity adjustment; Venusian gravity was only a little below Earth-normal. Raising his long arms over his head, Redwood stretched luxuriously. Then turned and watched Collins rubbing his bruises. "Still in one piece?" he inquired, concealing a grin.

"Just about," Collins grunted.

"Good," said Redwood. "Because you're about to leap into action. The sooner we set up our gear, the sooner our job will be finished and we can get the hell out!"

Collins and Davidson, Schultz and Tanner spent the next few hours in the storage area between the inner and outer hulls at the front of the scaphe. They were readying equipment designed for use in the open. Each item had to be connected to its power source, tested, then sealed into the casing which would protect it from the furnace gloom of the plain.

In the flight cabin high overhead, Katherine monitored the weather. She was worried about a frontal system approaching from the south. Redwood watched her with absent-minded pleasure as he munched his way through a stack of outsize sandwiches.

Their work finished, the four below left the storage area, passing through an airlock in the inner (true) hull. After a short meal break, Davidson, Schultz and Tanner headed for the nearby suiting-up cabin. They helped each other into cumbersome, heavy-duty suits whose helmets each bore a distinguishing device so that the wearer could be recognized.

Collins made his way to the flight cabin, where Katherine poured him coffee. Almost shyly she handed him the mug. Their fingers touched. Coffee slopped onto the floor. Redwood listened to the ensuing duet of apologies with a frown.

Below, Davidson, Schultz and Tanner waddled back through the airlock. "Ready, Commander," they said in turn into their suit transceivers.

The pumps began to hum, replacing the storage area's terrestrial air with the scalding gases of Venus. When the pressures outside and inside were equalized, the outer (false) hull angled down, transforming itself into a platform. As soon as it was flat, the three suited men began to shift equipment onto it.

In the flight cabin, Collins peered into the adapter screen. Suddenly he caught his breath. "Christ, the fools—they're bolting their gear to the platform. That's too dangerous. Suppose the oil comes flooding up as it did before?"

"We're safe enough inside the scaphe," Redwood told him.

"How can you be sure? The complex was smashed to pieces."

"The oil won't smash us. Not even a quake can damage our hull, it's impregnable. Besides, we know what we're doing; we've collected samples before."

"But this time—"

"—things are different." Redwood finished Collins' sentence, and grimaced. "Maybe they are. Maybe not. Either way we've got no choice, our gear has to be anchored against the weather."

"I don't like the thought of our being unable to lift off at once in an emergency."

Redwood said shortly, "None of us does."

"Couldn't we sink temporary bolt-foundations into the ground?"

"No. We've neither the time nor the apparatus."

Collins' mouth set thinly. He watched the suited men uncap the borehole puncturing the plain just off the platform's edge, inspect the dry shaft, replace the heavy cap; then, clumsily and slowly, maneuver the drill into position. He watched them ducking and weaving among the tangle of machinery as they ringed the borehole-collar with pressure-resistant containers. Into these would be funneled the oil . . . *Killer oil,* thought Collins, naggingly aware of the shattered ruins around them. He felt a nerve jump in his cheek.

Katherine said to Redwood, "The front is approaching fast. The men outside will have to hustle."

Redwood flicked down a switch on the control-board, spoke into the mouthpiece of the main cabin transceiver: "Redwood calling. Andy, Heinie, and you, young Tanner: stand by. I'm joining you."

"Me too," said Collins.

"No."

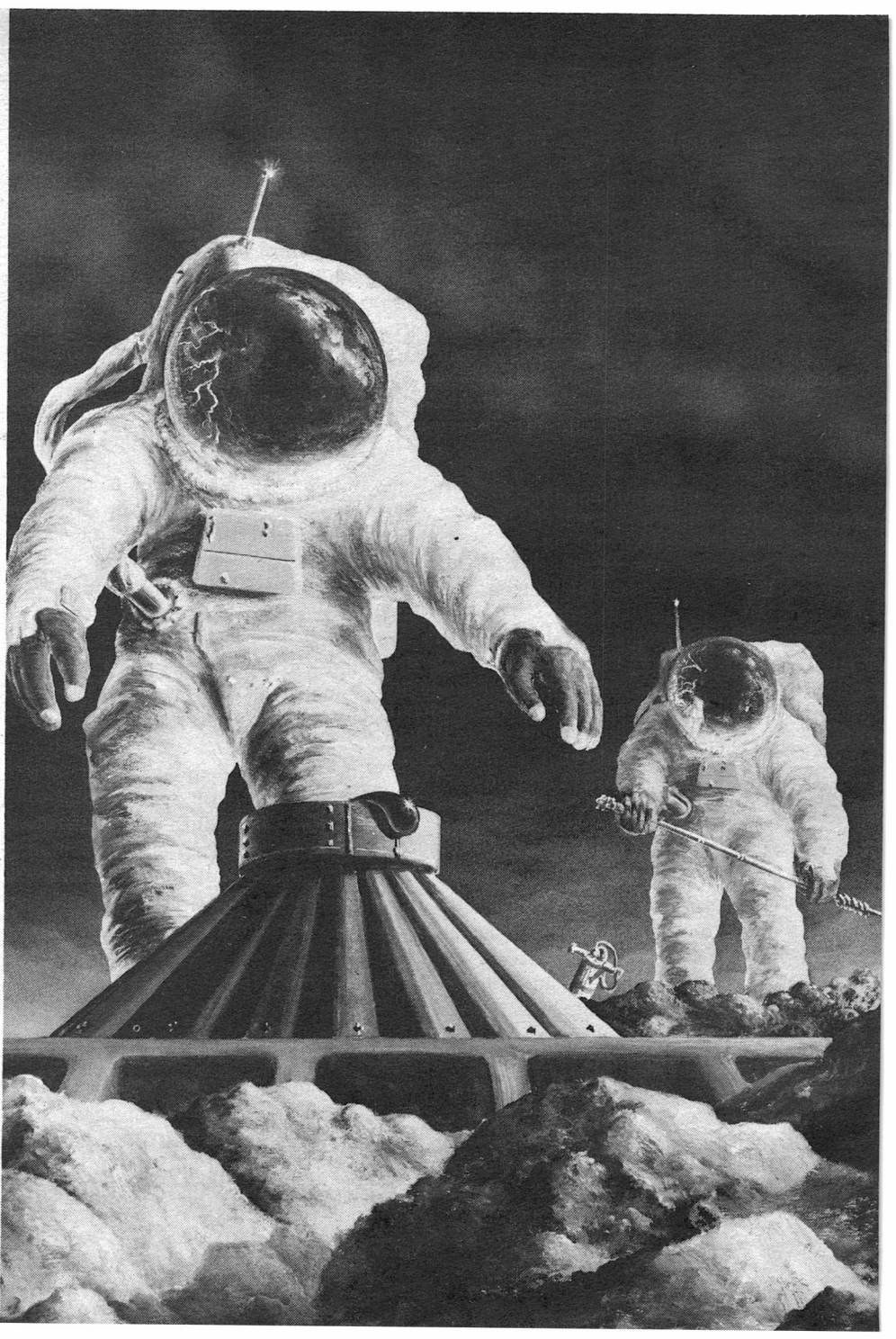
"But—"

"No!" Redwood told the geologist firmly. "It takes months to train a man to work on the surface. He's hampered by his suit. The air's like treacle. Yet, if he's not as nippy as an acrobat, he's knocked arse over elbow by the wind. On top of that, he's disoriented by optical illusions. A tyro wouldn't last five minutes. So no, Dr. Collins. Sorry. Thanks just the same."

With Redwood helping, the activity on the platform speeded up. Before long the drilling equipment was all in place. The suited men turned to Collins' instruments.

"Will you direct us, please, Doctor?" Redwood's request, roughened by static, emerged from the cabin transceiver.

"Certainly." Collins wriggled to the edge of his chair, peered more closely into the adapter screen, depressed the transceiver switch and talked. After a while his voice grew hoarse. He groped across the navigation table behind him until his fingers connected with the coffee-



jug. He poured its remnant of cold, scummy dregs into the nearest mug, sipped, grimaced, fumbled the mug back onto the table.

"The front will soon be upon us," warned Katherine.

Collins talked faster. The workers outside hurried. With inevitable results.

"No, Mr. Tanner, you've got it the wrong way round," Collins told the youthful navigator, who was busy embedding a seismic recorder in the ground.

Tanner eased the recorder, bulky in its protective casing, out of the hole he had prepared for it. "Like this?" he asked, and turned it upside down.

"No," said Collins. "The other way up, please. Now, rotate it approximately sixty degrees clockwise. Whoa, that's counterclockwise! Ah, that's better but you've gone too far . . . Back a bit. Back a bit more. A tiny bit more. Fine. Now, lower it gently—*gently!*—into its hole and *No!* Stop! *Stop!* You're tangling the leads . . ."

Meanwhile, almost out of sight to the left, Davidson was attaching temperature and pressure gauges to the wall inside the subsurface section of the complex. Collins spotted what was happening just too late to stop him. "Wait, Mr. Davidson! They're not far enough in!"

"Can't get 'em further in," Davidson's voice crackled tersely over the radio. "Unsafe. Since we were last here, the acid in the atmosphere has eaten away the walls. The whole place is disintegrating."

"Well then take the gauges out and find some cranny in the cliff that will do instead. They must be out of the wind if their readings are to be accurate."

"They are out of the wind."

"Are you sure? I can see dust blowing—"

"It blows everywhere, Dr. Collins," Davidson interrupted.

"Um. Wouldn't there be some more suitable spot in—?"

"There wouldn't."

"But if you were to—"

"No, Doctor. This is *Venus,*" Davidson said patiently.

Katherine thumbed the button which operated a transmission relay designed to keep the meteorologist in touch with the group out in the open. "Commander, there's an anomalous pressure gradient developing ahead of the front," she said. "The whole system is broken and strongly fluctuating. We're in its path."

"Thanks, Katherine. Right, everyone, stop blethering and get a move on," Redwood ordered briskly. "You there, Heinie: shift!"

Schultz, who had paused to enjoy Davidson's exchange with Collins, plodded onto the storage area to collect the last remaining scanner antenna. He trudged off toward an outcrop of boulders hundreds of yards from the cliff. Halfway there the wind solidified into a hammer. Schultz fought for control of his

clumsy suit; stumbled. The wind pounded him flat. Clutching the antenna, he rolled and slid, feet straining for purchase on the rotten ground. The lifeline anchoring him to the scaphe snaked after him. Before it could snap taut, his toes locked into a crumbling cavity. He skidded to a muscle-wrenching halt.

Collins clapped his hands to his head. "Oh sweet Jesus," he moaned. "That's part of some very important apparatus! If that bloody lunatic has broken it—"

"I haven't," Schultz's voice rasped breathlessly from the cabin transceiver. "All equipment used on this planet is extremely tough. It has to be, or it could not survive."

Katherine glanced over her shoulder at the adapter screen, then returned to her meteorological instruments. Her face was puckered with anxiety.

Schultz levered himself awkwardly to his feet and stood leaning almost horizontally into the gale. "*Herr Doktor,* is it really necessary to take this gadget as far as those boulders?"

Collins waved his hands excitedly. "I'm sorry, Herr Schultz, but I'm afraid you must, or the scanner won't scan properly."

Schultz realized the truth of that; the scanner worked on a similar principle to sonar, but used shockwaves instead of soundwaves. It built a diagram of the crustal rocks, showing the pattern of the buried strata. It delineated the oil-bearing layer, and showed the limits of oil permeation.

But only if the antennae were placed correctly. If they weren't, the diagram was a fuzzy mess.

Schultz sighed. "Ah, so. I'll do my best, *Herr Doktor,* but I can't guarantee success. Those boulders are a long way from the cliff. I'll be exposed to the full force of the wind."

"I'm sure you'll manage somehow," said Collins. "Look how well you distributed the other antennae!" He meant to sound encouraging; he sounded the reverse.

After several more near accidents, Schultz succeeded in planting the antenna firmly among the boulders. By that time Collins was out of his chair, bellowing obscenities and hopping from foot to foot like a frantic elf.

Suddenly he remembered Katherine's presence. He stopped short. He flushed scarlet. "Oh, Christ," he muttered. "I apologize, Kate. I forgot there was a woman in earshot."

Katherine said mildly, "I've heard worse."

"Have you?"

"Occasionally."

Collins shut his mouth tight. He looked miserably embarrassed.

Katherine half smiled. "Cheer up, Chris. Remember that Dartmoor project where we first met? You never bothered about your language there."

"I was a boy then."

"You were twenty-six. Old enough to father a child."

"What!"

"Didn't you guess? Why else do you think I fled from your research team so precipitously as soon as our job was finished?"

Because of her mother's sudden illness. That had been her story at the time, and Collins had believed it. His face became a study of consternation.

Redwood's voice roared over the radio: "Hey, Doctor, where the blazes are you?"

Hastily Collins leaned toward the transceiver. "Here, Commander." He began again to fire instructions like bullets. Within minutes Katherine was forgotten. And her shattering news.

The pressure gradient steepened. The wind increased. The churning blood-red sky grew darker and darker.

"Yes, Doctor, I've fixed it exactly as you directed," said Tanner, his heavily gauntleted hands braced against the massive shielding which protected the magnetometer.

"Hang on," Collins ordered. He crossed the flight cabin to the area allotted to geological equipment. He flicked switches and glared at the magnetograph as though sheer force of concentration might set its pens in motion. He hurried back to the transceiver. "You can't have done. It isn't working," he said in despair.

"Maybe it's too near the scaphe," Tanner suggested.

"No. It's far enough away for the scaphe's fields not to affect it. Besides, it's not giving wild readings. It's giving no readings at all."

Twenty minutes later it was still giving no readings. The men in the open clustered around it. Four pairs of hands poked, prodded and shook it. The rest of the work was finished.

Lightning began to flicker and dart among the grinding clouds.

"God, if I could only have a look at it myself," wailed Collins.

Redwood said, "You shall. Get into your suit."

Someone hissed.

Davidson said urgently, "Sir, it's too dangerous. He'll be blown off his feet."

"He won't. You and I will hold him upright." Redwood raised his voice: "Katherine, can you hear me?"

She thumbed her transmission button. "Yes, Commander."

"Help Dr. Collins into his suit."

So keen was Collins to get outside that he never even noticed the care with which his erstwhile mistress double-checked every suitseal, knowing that the slightest error on her part would kill him.

Collins floundered across the platform, weighed down more cripplingly than any deep-sea diver. Each step was a battle with the wind. Only the restraining hands of

Redwood and Davidson prevented him from being whirled away.

On Earth, it is a simple procedure to step from the edge of a platform onto the ground. On Venus, it is a complicated and exhausting maneuver.

Collins, teetering unsteadily, turned to face backward. The stiff-jointed suit made kneeling impossible, so he tilted forward, bending at the hips, knees and ankles. His weight was supported, precariously, by Redwood and Davidson. Collins lowered a foot over the edge . . . And stuck, one foot grounded, the other airborne. His fingers strained impotently toward a holding-bar placed in what was supposed to be (but wasn't) easy reach.

"Relax. Let yourself go. We won't let you fall," said Redwood.

"Sort of float backward," Tanner added helpfully from behind him. "Herr Schultz and I are all set to catch you."

Float backward? Impossible. With a convulsive jerk Collins wrenched himself upright. A concrete-solid gust of wind scythed his feet from under him. With a squawk he tumbled off the platform.

Schultz and Tanner seized him, held him vertical while he whooped for breath.

He became aware of Redwood's voice echoing in his helmet: "Don't look up. Don't look up. Look at the ground."

Collins remembered Venus' devastating optical distortions. He kept his eyes down as, aided by the four veterans, he crunched over the sterile pavement of baked stone toward the magnetometer.

Collins could find nothing wrong with it. Not that that meant much; one invisible crack in its shielding, and the atmosphere would shriek inside, wrecking the instrument within beyond repair.

"So the thing's a write-off," said Redwood.

A jagged shaft of lightning arrowed from the cloud-rip to the ground.

"Not necessarily." Collins was loath to admit defeat. "We can't be sure unless we strip it down completely. We can't do that out here."

"We can't do that full stop," said Davidson gruffly. "We haven't time."

Katherine's voice sliced across their speculations. "An aerial eagre is approaching. It's fanning out across the plain, moving at speed. Come back, all of you. Hurry!"

Collins felt himself being turned round with great care and pointed in the scaphe's direction. He looked up.

The scaphe was an amorphous roseate blur. Behind it and around and above, wavering monstrously through the deceiving murk, the cliff loomed from all angles. Its face was dotted with glowing eyes—incandescent mineral outcrops. Its crest curled over their heads like a breaking wave.

Collins froze, transfixed with horror.

"Look at the ground." Redwood's shout was tinny and far off in his suit's transceiver. *"Look at the ground!"*

Somehow Collins made it back to the storage area. So did the others. One by one they passed through the airlock, scrambled out of their suits.

Schultz said with incongruous formality, "We may have to jettison the magnetometer. I regret it most deeply, *Herr Doktor.*"

"Not your fault," grunted Collins.

"At least no one's been killed," said Redwood. "That's more than can be said for our predecessors."

With his mind's eye Collins saw the ravaged complex, saw the visually insane cliff lowering above as though malignantly alive and bursting to crush ruins and scaphe and all under thousands of tons of toppling rock. He shuddered.

One day on Venus is as long as several Earth-months; indeed, Venus' day is longer than its year. Human metabolism is geared to the home-world's twenty-four hour cycle. For efficiency's sake, Redwood's team kept Earth-time while working on the surface.

After supper, the men retired to their sleeping cubicles. Collins and Katherine lingered in the flight cabin one deck below. Collins was testing his remote control instruments to ensure that they were ready for immediate use on the morrow.

He scowled at the printout from the pressure gauge. "This thing's gone mad." He recalled Davidson's efforts to site the gauge out of the wind, and sighed. "Hardly surprising. The thing's scarcely sheltered at all."

"There's an eagre passing," Katherine reminded him drily.

Collins swiveled to look at her. "I know about terrestrial eagres—walls of water which sweep upriver when the tide turns. But an aerial eagre"—he gestured toward the window, blind with flying dust—"what's that?"

"The same, more or less; but for water read air."

"A tidal bore of atmosphere, eh? What causes it?"

"It forms in the lowest part of the troposphere, when certain configurations of heat and density interact with mass air movements arising from the planet's slow rotation." Katherine wrinkled her brows. "I'm afraid that's a grossly oversimplified explanation."

"Never mind. I get the general idea. And this present eagre: where does it come from?"

"A high plateau region. It funneled through a cleft and then surged in a precipitous wave across the plain. By now it's past its peak. The temperature outside should drop dramatically soon—if it hasn't already."

Collins checked the appropriate recorder. "Yep. You're right. The temperature has fallen forty degrees." Without meaning to imply condescension, he added, "Clever girl!"

Katherine bristled.

Collins watched the pen of the seismograph scrawling an erratic trace on the drum. These tremors were a side-effect of the eagre, and of no immediate importance. He noted down the date and time, then turned to the magnetograph. Bloody hell! He'd forgotten that the thing was out of commission.

Katherine turned back to her meteorological instruments, seething with throttled rage. "Clever girl" indeed—as though he were pleasantly astonished to find her capable of doing her job! This boor whom once she had loved was as insensitive as ever. As for her bombshell about the baby, that had misfired ludicrously. This brute had taken not a blind bit of notice. To complete the fiasco, that particular bombshell could not be detonated twice.

She'd been stupid not to wait for a more suitable moment to stage her Grand Revelation. But she might have waited forever; aboard the scaphe, privacy was minimal. Besides, her courage might have deserted her.

Collins bent to stare into the scanner screen. Below it, a row of dials controlled the diagram which represented the oil-field's position. Collins rotated the dials, a fraction at a time; the blurred lines swam into sharper focus.

He straightened. "Bed for me," he said. "After I've run off a copy of this."

"Why bother now? It'll still be there in the morning."

Collins heard the savagery in Katherine's tone, and flinched. "I know it will, b-b-but . . ." To his intense annoyance he began to stammer. He waited, then tried again, ducking that treacherous "but": "I can never sleep well if I leave a job only half done."

Katherine muttered something. It sounded like *More fool you.* She tucked her feet under her chair and concentrated on her instruments.

Collins drew breath for a scathing retort, but his nerve failed. Quivering with indignation, he prepared a flimsy of the scanner diagram. He detached it, filed it neatly with the printouts from his other instruments.

Katherine stood up. The eagre was past; its backwash showed no sign of springing any nasty surprises while she slept. She set the alarm circuits to give automatic warning of serious change, then rapped out brusquely, "I'm off. Good night."

Collins looked into her wide-set eyes. Their luminous darkness was dulled, their animation quenched. Collins saw the weary droop of her shoulders, the pallor of fatigue dimming her tawny skin. He was

gripped by a passionate urge to protect her. He blurted, "Why—?"

"Why what?"

"Nothing." He'd been about to ask, *Why do you hate me so?* He fled from emotion into frigid courtesy. Stiltedly he said, "See you in the morning, Kate." He nodded a polite dismissal.

"Yes," Katherine answered, equally polite, and left.

Collins watched her go, obscurely aware of chances missed.

No day on Venus could shine clear. Next morning, when Redwood's team assembled in the flight cabin, they found the nearest approximation. The lowest level of the troposphere had been scoured free of smog by the eagre. Fugitive gleams of brightness pricked the thick red gloom. Less dust than usual blew in the flame-breath which on Venus passed for air.

"Excellent weather," Katherine announced with satisfaction.

"How long will it last?" asked Redwood.

"Probably for some time."

"How long is 'some time'?"

"Sorry, Commander, I can't be specific."

"Ten hours? Ten minutes?" Redwood probed.

"Oh, several hours."

"Thanks. That's what I wanted to know."

Katherine spotted Collins' grin. Her fingers itched to hit him.

Redwood frowned through the window at the scene of yesterday's labor. Every item of equipment was buried under a heap of grit. He briefed his men on their first task: to clear the area. After that the real work, the deepening of the borehole, could begin.

While Davidson and Schultz wielded high pressure gas hoses outside, Collins studied seismograph traces. He reset scanner dials. He tried to examine magnetograph readings. And cursed under his breath.

Two hours later, he and Tanner were in the scaphe's workshop, rummaging through the dismembered components of the magnetometer. Tanner lifted a loose wire. Collins poked the terminal. "Broken! Of all the . . . The thing must have received a hell of a wallop. Who the devil—?"

Tanner looked up with a cheeky grin. "Not guilty, Doctor, so please don't pounce on *me!* Besides, you should be blessing your luck. The odds were on this thing being irreparable. Instead, we can patch it up quite easily."

Off the platform's edge, the drill was descending into the borehole. Came the moment when oil gushed up, spurting in black sheets from the collar. A flurry of activity, and it was being guided into a waiting container.

Collins scrubbed grease from his hands and wondered whether Tanner, now outside, was managing to position the magnetometer cor-

rectly. Still dubious, he made his way to the flight cabin. All concern for his own affairs vanished when he sighted Redwood's grim expression. "What's wrong, Commander?" he asked.

"We've hit the same snag that the complex's team hit. After a promising start, the oil stopped flowing"—Redwood snapped his fingers—"just like that."

"Do we know why?"

"No." Redwood gestured toward the geological section; since Collins' firework display the day before, it had been nicknamed The Maestro's Corner. Redwood said, "I'm hoping your gear can tell us."

Collins skimmed through the most recent printouts, comparing the fresh data with earlier findings. He checked the magnetograph, and found to his relief that Tanner had done his job well.

As he worked, Collins became aware of Redwood and Katherine hovering behind him, watching his every move, the man emitting an aura of fierce single-mindedness, the woman eager and apprehensive. He grew increasingly restive under their concentrated attention. Especially Katherine's.

"Found anything?" asked Redwood.

Collins hesitated. "Nothing that explains what's happening."

Redwood's eyes narrowed. "So you *have* found something. What?"

Collins detached the magnetograph printout, spread it on the small table beside him, pointed. "Look at those ripples. They're like the ones discovered by my predecessor who was killed." He glanced toward the window, imagining rather than seeing the ruined complex outside; then squinted up at Redwood's face. "Interesting, aren't they?"

"In what way?"

"They're completely at variance with this world's magnetic field."

"What does that mean?"

"I've no idea. Nor had my predecessor. A lot more information needs to be gathered before we can begin even to speculate."

"What bearing do those ripples have on the cessation of the oil-flow?" demanded Redwood, keeping his priorities right.

"None that I know of. The work done previously suggests that they may be peculiar to the oil-rich regions. They seem to be linked somehow with tectonic disturbances, such as the tremors which resulted from the eagre's passage last night. I can't be sure, mind you; the magnetometer wasn't working before." Collins gave a crooked wisp of a grin. "This is largely guesswork. I doubt that it has much relevance to our problem here. Oil-wells don't go on strike because of a magnetic flux."

Redwood squared his shoulders. "Good point. Thank you, Dr. Collins. Katherine, what's the weather doing?"

"Behaving." The woman consulted her instrument panel, and added, "Temporarily. There's another frontal system on the way."

"Which means that before much longer work outside will have to stop. H'm. The chaps out there had better get cracking with the pump while they still can."

The pump was soon in operation. The oil refused to flow. After a while Schultz started wondering aloud whether the stratum of porous rock had run dry. No, Collins told him, the oil was down there all right, and under pressure which should have brought it spouting up like blood from a cut artery.

Dust began to whip among the machines clustered on the platform, clinging to their windward side. Mingled with the dust, silver amid soot, flew incandescent grains of sand. The wind was veering; it was snatching at the dunes which skirted a crater-pitted desert.

Katherine said, "A tornado is forming near the center of the plain. The men should come inside."

Redwood flicked down the transceiver switch. "OK, you fellows. Pack up now."

A chorus of "yessirs" were spoken into suit transceivers. Someone (Collins suspected Davidson) added a heartfelt *basso profundo* grumble: "About time too! I'd give my soul for a cup of tea."

The pump was disconnected and secured. The cap was plugged into the borehole-collar to prevent wind-carried debris from silting up the shaft. Laboriously Tanner, Schultz and Davidson half waded, half swam to the airlock, too spent to speculate about the enigma underground.

Men working at exacting tasks must have adequate rest or their efficiency suffers. Despite his anxiety about the oil's behavior, Redwood ordered a shut-down till the morrow. All automatic alarm circuits were activated. No danger now could catch the crew off guard.

Men working on alien worlds are forced often to make judgments based on insufficient data.

Collins and Katherine once again found themselves alone in the flight cabin. Katherine was observing the development of the tornado and of the army of spinning vortices marching in its wake. This could be done only by means of instruments. The sensors, whose input was processed to build the image on the adapter screen, showed the tornadoes as faint shimmerings in clear air, while through the window nothing could be seen beyond a writhing shawl of dust.

Katherine yawned, rubbed knuckles into eyes itchy with strain, and turned to see what Collins was doing. Seismograph and magnetograph drums were revolving slowly before him, their pens scribbling

drunken spider-tracks across the paper.

Collins watched them, intent. The clean lines of his brow and jaw contrasted oddly with his flat-bridged button of a nose. The sandy hairs on his wrists glinted like bright threads as they caught the light. From time to time he detached a printout, studied it briefly, filed it away. His thin hands moved in a way which suggested tight-strung nervous energy held under erratic control.

That sinewy frame of his concealed an unexpected strength, Katherine recollected. Suddenly every fiber of her body was vividly aware of him.

No, she thought. *Not again. Once was enough. He's poison.*

Collins switched on the scanner screen. He reached for the equipment he needed to prepare a copy of the diagram. As he did so, he glimpsed Katherine's face before she had time to censor her expression. Chilled, he looked down; then up again. "Kate . . ."

"What?"

Collins shook his head. There was something important that he needed to ask, but he couldn't remember what it was. "K-K-Kate, I . . ." This was appalling. He was floundering like a tongue-tied adolescent. He said in a rush, "I had no idea you were working on Venus, not till I arrived here and saw you." That wasn't what he'd meant to say at all.

Katherine smiled without humor. "Did it give you a horrid shock?"

"No, no, not a shock just a—um . . ."

"Pleasant surprise. I'll bet! You know, Chris, where people are concerned, you've always been astonishingly unobservant. For example, do you ever read the scientific journals?"

"Those which have any bearing on my work, yes, certainly."

"Do you keep abreast of research on planetary atmospheres?"

"Of course."

Katherine's dark brows acquired a sardonic tilt. "And you've never once seen my name appended to any articles?"

Collins was stung by her manner. "No, I haven't," he snapped. "The reason is very simple: you've changed your name. I knew you only as Ekaterini Haralambopoulos."

Katherine gave a snort of laughter. "Bravo! But you still can't say it, can you? You don't even stumble, you fall flat."

"What do you expect? It's an impossible name. No one could pronounce such a tongue-twister; at least, no one who wasn't Greek—"

"Precisely. That's why I anglicized it."

That made sense, as Collins could see. Katherine was English in all but blood. Born and reared in London, she was the ambitious daughter of immigrant parents. How she had changed from the

fragile little waif he'd known, all huge dark eyes in a wistful little face! Now she was a sensuously curved woman, independent, intelligent, exciting.

Collins watched the pulse beating below her ear, half hidden by a coil of shining hair; he smelled the elusive scent of the soap she used. A swarm of tactile memories awoke in him; his fingertips could almost feel the downy warmth of her skin. God, how close she was to him—after ten empty years, so close—yet farther than the hub of the galaxy.

And she was the mother of his child?

Collins, who never before had experienced the slightest wish for children, felt a wave of emotion almost suffocating in its intensity. Stammering again, he said, "Kate, those last terrible weeks before our final row—why didn't you tell me you were pregnant?"

"Why should I? Would you have married me?"

"Well . . ."

"Exactly."

Suddenly Collins was twenty-six again and lost in the old, old quarrel with his girl. "There you go again! You won't even let me finish my sentence! Yes, I might have married you."

"Out of pity? Noble self-sacrifice?"

"Damn it, yes!"

"Thank you very much. I appreciate your proposal, late though it is."

Collins stiffened. Gone was his usual elfin look; his lips were drawn back in a snarl which bared his teeth. "I'm not proposing. Nothing would induce me to marry you."

"That's why I didn't tell you I was pregnant," Katherine retorted. "In any case, what makes you so arrogantly assume that I'd have accepted you?"

Collins laughed; the sound was gratingly contemptuous. "At the time you were fishing for a proposal diligently enough. Jesus, how you cheapened yourself!"

Katherine's face paled, becoming sallow and almost ugly. "Did I? Not for long, I'm sure. Because you made your views on marriage very clear. 'No weddings for me, not with anyone, ever,' you said. And Chris: I'm everlastingly grateful that you turned me down. Know why? Because you're a farce in bed. Impotent one night, and the next night like an ape, pawing and slavering and sweating, no finesse, no control—you left me feeling *filthy!*"

Collins was still holding the unfinished copy of the scanner diagram. During the silence which followed, the flimsy began to shake. Collins tried to steady it. At once the trembling sprang to his hand, to his arm, to his whole body.

Collins stood up. Keeping his back to Katherine, he crossed to

the far side of the flight cabin. With icy calm he said, "You'd better get some sleep. We want you fit for work tomorrow."

"You needn't worry," Katherine said. "Our private little . . . vendetta . . . won't affect my skill."

"I'm glad to hear it. All the same, please go."

Katherine hesitated, made for the door.

Collins listened to her footsteps, to the click of the latch, to the faint swish of the runners. He spoke in an exaggeratedly neutral tone: "The baby: what happened to it?"

Katherine answered bleakly, "It's dead. I had it aborted."

Collins' hands clenched, then loosened. He said not another word.

Outside, the last dwindling tornadoes stalked across the corroded plain. They kissed the parched ground, skipped, kissed it again, their lightning-livid mouths sucking up cubic miles of dust.

Dragged by the reeling vortices, boulders walked. Teetering, they plunged into gullies. Hurtling downward, they slammed into obstacles, rebounded. Behind them trailed avalanches of scorched and blackened stones.

Collins slept, to dream of dead children. Among them moved Katherine, metamorphosed into an Earth Mother, her wide eyes brimming with tears.

The shrilling of the alarms woke him. For a moment he lay listening, wondering what they were, trying to fit them into the fading dream.

The scaphe shuddered, a series of gentle jerks followed by a strange fluid slithering. Collins catapulted himself off his bunk. Voices shouted in the passage outside his cubicle. Running footfalls clattered past. Collins yanked on his overall over his pajamas, thrust his feet sockless into his shoes and sprinted after the others.

Tanner came bounding up the emergency stair which led to the lower levels of the scaphe. "I can't get down," he panted. "Some maniac has lowered the safety doors and sealed off everything below the flight cabin."

Redwood poked his head out of the flight cabin doorway. "The maniac is me," he said. "The lower decks will stay sealed off until we've learned what's happened." Like everyone else, he was wearing pajamas. His gray Space Service uniform, snatched up as he left his cubicle, was tossed untidily over the back of the pilot's chair.

Schultz scratched the blond stubble on his unshaven jaw. "The engine-room—"

"The engine-room must wait," Redwood interrupted. "Come here and you'll see why."

The men crowded into the flight cabin. Katherine followed, tying the sash of a thin green dressing-

gown which shimmered to her every movement. Her loosed hair tumbled over her shoulders in an ebony cascade.

Redwood pointed at the adapter screen. Starkly he said, "Look there."

Six pairs of eyes focused on a sea of oil, dark, viscid, shining, scabbed here and there with leprous patches of sand.

"*Gott in Himmel!*" muttered Schultz. "The cap—it's blown out of the borehole's collar as though by an explosion! What inconceivable force could have done that?"

Davidson hurried to the window and peered down. "The platform is totally submerged," he said. "It's impossible. The oil should be flowing downhill away from us. Instead—*Look.*"

Collins headed for The Maestro's Corner. A quick scan showed him that most of his equipment was still functioning normally. "At least the power plant hasn't been put out of action," he said. "Can we lift off with the platform down?"

"*Mein Gott,* no!" Schultz exclaimed, horrified.

"It would catch the wind and capsize us," Davidson explained. "The strain on the engines would be intolerable. Though mind you, if the only alternative were certain death—"

"Quiet, everyone," Redwood interrupted. "Our first job is to find out exactly what the oil's doing. Dr. Collins, check what's going on underground. Heinie, Andy, help him. Katherine, please monitor the weather. You, young Tanner: glue yourself to the control-board and keep close watch on all its screens."

Collins examined the seismograph. If a quake had tilted the plain so that its gradient was reversed, the direction of the oil-flow ceased to be a mystery.

The seismograph's printouts showed no sign of tectonic activity capable of causing their plight.

"Anything we can do?" asked Davidson, who, with Schultz, stood behind him breathing down his neck.

"Not at this moment," said Collins. "Yes there is! Go through—hang on a tick."

"What is it?"

Collins sat frowning at the magnetograph. "That's funny."

Davidson's voice sharpened. "What's funny?"

Collins pointed at the revolving drum. Pens gyrated over it, scoring a lunatic dance. Collins said, "See those ripples, the ones unrelated to this planet's magnetic field? See how they've intensified?"

Davidson and Schultz squinted at the ripples. Schultz asked, "Have they not been there to some degree all along?"

"We don't know. The magnetometer wasn't working at the beginning, remember." Collins bent closer. "It looks almost as though there's a sort of rhythmic pulse, very rapid, and overlaid by echoes

which sometimes cancel and sometimes reinforce it." He paused, aware of growing tension. "I wish to God I knew what's gingering it up. The eagre's passage? Hardly; the tremors sparked off by that event died down long ago."

Katherine spoke inches from his ear: "Could it be our drilling, Chris?"

Collins suppressed a start. He had not noticed her approach. He twisted to include her in his field of vision. Lightly, accidentally, his elbow brushed her hip. Every muscle in his body went taut.

"Well, is it our drilling?" That was Redwood. Temporarily he too had joined the brain trust around the magnetograph.

Collins said gruffly, "I doubt it."

Redwood motioned Davidson and Schultz to stand back. He gripped the geologist's bony shoulder, digging in his fingers like the prongs of a trap. "Listen to me, Doctor. You too, Katherine." His voice was soft, so soft that only Collins and the woman could distinguish the words. "I don't know what nonsense is brewing between you two, and I don't want to be told. I don't care a damn about the health of your sex-life. All that concerns me—quiet, Doctor!—is the safety of this scaphe and its crew. That safety is jeopardized—*quiet!*—when two important members of the team neglect their duties. And your duties get neglected every time you down tools to bristle at each other. So"—Redwood's glare encompassed them both—"this idiocy will stop at once. From now on you'll behave like adults and not like spoiled brats. Understand?"

Redwood gave a final hard squeeze, then let go. He thrust his fingers through the tangled spikes of his uncombed hair. "Right, Doctor." He resumed his normal friendly tone. "We were wondering whether our drilling could affect your magnetograph readings. Well?"

Collins answered, "I don't know, Commander. This kind of magnetic pulse is something new. It still awaits investigation. It's unknown on Earth." His voice shook with fury.

The scaphe lurched. Despite its massive weight, the platform slewed sideways under its mantle of oil. The superstructure groaned. Glancing at the adapter screen, Collins saw the oil heave, convulse, smooth itself again to a slick, thick sheen. An idea sneaked into his mind. He studied the magnetograph, followed the pulse pattern leaping across the drum. Absurd. He looked away, massaging his bruised shoulder. This was not the time to stalk wild fantasies.

Redwood hastened to the pilot's chair. He and Tanner examined the control-board, leaning forward with their heads almost touching. Tanner ran a hand along the row of internal telescan screens. "Look, sir,

the oil has breached the airlock," he said. "It must have concentrated a—a spearhead of unbelievable pressure right on that spot. The suiting-up cabin is flooded. So is the passage outside it. The workshop will be the next to go."

Collins, listening, felt a moth's-wing-flutter of panic. Suppressing it, he checked the scanner. And was pricked by puzzlement. His memory must be playing him false. Unless . . . ?

Collins reached for the scanner flimsies. He spread them on his table and hunched over them, studying the diagrams which showed the dimensions of the oilfield. He compared each to each, and grew cold with horror. Redwood had been right: he, Collins, had allowed his preoccupation with Katherine to distract him lethally.

Davidson touched his arm. "Are you all right? You've gone as white as a ghost."

Collins looked into the older man's eyes—pale blue eyes made even paler by contrast with the seamed brown skin around them. He looked at the match-stick wagging from the corner of the wide thin mouth. He forced a smile. "See what's happened to the oilfield since we started drilling?"

Davidson examined the scanner flimsies. Schultz, staring past his shoulder, drew in his breath with a sharp hiss. "So-o-o!"

Davidson straightened. "Yes, I do see. The field is contracting, centering on us . . ." Abruptly he called to the Commander: "Sir! Come and look at this!"

A couple of heartbeats later Redwood was again among them. Tersely he ordered, "Show me. Quick."

Collins pointed out discrepancies between the diagrams; said: "Notice how the changes are very slight and very slow at first, then gather momentum?"

"H'm. Explain."

"I—I . . ." Collins tailed off, sick with guilt at his failure to spot the discrepancies earlier. Worst of all, that failure was due, not to simple oversight, but to criminal negligence.

Redwood prodded him. "Come on, fellow! What's your explanation?"

"I—" Collins stopped short. Even at a time like this, he couldn't risk making a prize fool of himself. In any case, so wild an idea was bound to be wrong. Even if it weren't, keeping it under wraps would make no difference to their chances of survival. He muttered, "Sorry, I can't explain. Not yet. I need more evidence."

"You won't get it. Our top priority is to escape."

"With a quantity of oil on board." Collins braced himself. "Commander, that oil must not be allowed to drain away. More than that: the utmost care must be taken to preserve it in its pristine condition. Because if we do so, and my

guess proves right, then when that oil is analyzed"—Collins smiled twistedly—"our Earth will receive one hell of a big surprise!"

Where the oil went, there also went the atmosphere. The scaphe was designed to withstand hellishly high temperatures and pressures from outside, but not from within. With every minute that passed the interior walls and safety doors grew weaker, weaker, weaker.

Schultz said formally, "Commander."

Redwood cocked an eyebrow. "Yes?"

"Permission to remind you that, although our surface suits are out of reach in the flooded suiting-up cabin, we keep two spares up here."

"I know that, Heinie."

"May I use one to go outside to try to unbolt the machinery? Once the platform is freed, we can raise it and lift off."

"No, Heinie. The wind would kill you."

Collins glanced at the window. Intermittently the neoglass was whited out by flurries of sand. While they had slept, the wind had veered still further, and had strengthened. A sand-packed carbon dioxide gale was battering out of the desert.

Schultz said, "With respect, sir, we shall *all* be killed if we remain here."

"I'm aware of that," said Redwood. "And I greatly appreciate your offer. The answer's still no. That wind would tear you to pieces in ten seconds flat. Your sacrifice would be in vain." He hesitated. "Besides, if ever we do get airborne, I'll need you to deal with any damage the engines sustain."

Davidson cleared his throat. "I volunteer, sir. I wonder whether I can weight myself down somehow?"

Redwood shook his head. "To cheat the wind, you'd need to weight yourself so heavily that you couldn't move a step."

"If I anchor myself—?"

"Same problem. No mobility, so no hope of doing the job. An ordinary lifeline would be useless; it would snap like string."

Tanner, also volunteering, had a brainwave: "Why not use the oil itself as a windbreak? If we lay flat and tunneled through it—"

"No!" cried out Collins, who was disqualified from the surface venture by lack of experience in working in the open.

Redwood said to Tanner, "I quite agree. With oil covering your faceplate, how would you see where to go and what to do? You'd simply get lost."

Tanner's fingers knotted and unknotted. "There must be *some* way of freeing the platform," he said, trying to conceal desperation.

"There isn't. From the start I've been beating my brains out searching for one." Redwood dragged a

hand down the side of his face. "Our only chance lies in sitting tight until this gale lessens. Katherine! Any idea how long that will be?"

"Days," said the mission's meterologist. "So long as the wind remains in its present quarter, the sandstorm will intensify."

Silence: a tiny and hideously vulnerable oasis of silence in a bellowing inferno.

"There's one possibility," said Katherine.

Redwood's head came up sharply. "What?"

"I've been observing the wind's behavior. It's erratic, but there's an underlying pattern of gusts alternating with lulls. The pattern oscillates. At times the gusting is almost continuous; at other times the lulls predominate. During a prolonged lull-sequence, the men might be able to work outside." Katherine bit her lip. "It would be appallingly dangerous, perhaps impossible. If they were caught by a gust . . ."

"Funeral bells," murmured Davidson.

Redwood said crisply, "Shove your findings into the computer. See if it can predict when the next lull-sequence will start."

The computer reported: INSUFFICIENT DATA.

"So we wait," said Redwood. He reached for his uniform, pulled it on over his pajamas. At once the tired and rumpled middle-aged man was a coolly efficient Space Service officer again. The transformation was startling.

Two hours passed. Three lull-sequences crawled by, unused; they were too short to allow the work outside even to begin.

Sand lashed the scaphe. Sand blinded the window. Crusted with sand, the oil surged sluggishly over the platform, a pallid and glutinous ocean.

Davidson and Tanner suited up, except for their helmets. Those would be fitted on when and if the computer gave the word. Prompted by Redwood, they rehearsed their plan of action.

Redwood glanced from time to time at Collins, and was nudged by doubt. The little geologist looked worried out of his wits. But then who wasn't? Except that Collins' anxiety seemed subtly wrong, as though it were attached to something more than their obvious plight.

In the workshop, the air (no longer being recycled) was acrid with the stench of charred insulation. One of the walls was darkening. Into the center of the dark patch seeped the first faint flush of blackish crimson.

Another hour passed and another too-short lull-sequence. Redwood watched dials, meters, internal telescan screens. He watched Collins. He watched the rippling oil.

The air in the flight cabin grew electric with tension.

Redwood swiveled round, hooked one angular arm over the back of his chair, fixed Collins with a flat hard stare. "Right, Doctor," he said. "You've sat on your private problem long enough. You're going to tell us whatever it is you know."

Collins shook his head unhappily. "I know nothing."

"Whatever you've guessed, then."

"I'd rather not. Guesses could be dangerously misleading."

"I'll be the judge of that."

"But—"

"No more 'buts'! Something's scaring the life out of you. I want to know *what,* and I want to know it *now."* Redwood's voice became a whip-crack: "You're a member of a team, not a one-man show! There will be no more secrets. From this moment you'll share your thoughts with the rest of us. So talk! That's an order!"

Collins made an odd little gesture, of capitulation, of relief, almost of gratitude. He said, "The oil's alive."

"Eh?" squawked Tanner into the resulting astounded silence.

"You've flipped, mate," Davidson said roughly.

"Quiet, you lot!" Redwood held up a hand. "How can it be alive, Dr. Collins? Can you explain?"

"Yes. No." Collins twined his fingers together nervously. "Sorry, I'm muddling you. I don't mean the oil itself is alive, I mean there's a—a living entity using it as a medium of existence."

"Go on," prompted Redwood.

Collins chin-pointed at the adapter screen. "Look at the stuff in action. See how it moves, as though there's some kind of underlying muscular structure? And look at this." He tapped the magnetograph drum. "See the pulse pattern? Doesn't it remind you of the impulse pattern in a terrestrial creature's nervous system? Well, doesn't it?"

"Frankly, no," Redwood told him gently. "It's much too slow."

"Oh yes, of course, I realize that. It's millions of times slower and so weak that one needs an extremely sensitive magnetometer to pick it up at all." Collins gave a wan smile. "Our magnetometer is extremely sensitive. It has to be because Venus' field is so feeble. Damned lucky for us! Otherwise we'd have missed those pulses entirely."

"I regret to disagree," Schultz burst out in a curious blend of apology and belligerence. "Your so startling hypothesis must be wrong. For one thing, much of the time those pulses do not occur."

"Not that we know of, true; the oil-creature appears to have long quiescent periods. By our standards it may not be truly sentient, or even fully organic. We can't expect an alien entity to conform to life as we know it on Earth." Collins pondered. "My guess is that the eagre's passage activated it—the seismic

recorders detected ground tremors at the time. We finished the job by plunging our drill into its vitals."

Redwood grinned. "I'll bet the creature got the shock of its—well, maybe not life exactly. I wonder what dreams we shattered, what blissful visions of a red-hot mineral heaven!"

This witticism drew a burst of laughter from everyone except Collins, who shouted in sudden rage, "Stop it! You're humoring me!"

Redwood's smile flicked off at once. "I'm not," he contradicted. That was the truth; his joke had been contrived—badly, he now saw—to dispel the tension.

Collins' flush faded, leaving him pale—so pale that his faint scattering of freckles stood out like a rash. "Good," he said. "Because you forced me to speak before I was ready. I didn't want to, not without concrete evidence, but you *forced* me. Remember that!"

Redwood kept quiet.

Collins turned to Davidson, the expert. "Tell me, in those samples you've worked on in the past, didn't you find puzzling anomalies?"

Davidson frowned. "Such as what?"

"Different chemical signatures coexisting in the same sample, along with different densities and textures, as though oil from separate regions had been poured into the same container."

Davidson answered cautiously, "Yes. But those results were held to be inconclusive."

"It didn't occur to you that the various kinds of oil had been kept separate by internal membranes?"

"We found no trace of membranes."

"Naturally not," said Collins. "You examined the oil samples in the laboratories of Orbital Station Two. Any membranes adapted to survive the conditions of this world would disintegrate under the Earth-normal combination of coolness and low pressure."

Davidson struck his knee with his clenched fist. He should have thought of that himself. Smarting at the blow to his professional pride, he said, "Right, Doctor, let's start at the beginning. Describe your creature. If you can."

"Very well." Collins searched for words to clothe his still nebulous ideas. "Imagine the oil-field surrounded by a membrane," he said at last. "An *enormous* membrane, very fine to allow osmosis, and divided internally into sacs, each containing oil of a different type."

"Why?" challenged Davidson.

"I don't know."

"Guess. You're grand at that." The jibe was almost a sneer.

Collins' jaw-muscles flickered. "How's this then? The creature excretes different types of oil as by-products of its metabolism. Or it manufactures them for use, like bees make wax and honey. In case you've forgotten, the oil's a fantas-

tic fertilizing agent. That's why we want it for the Moon."

The atmosphere crackled with hostility. Deliberately Redwood chuckled. "Excellent, Doctor! You've solved the mystery of its origin—provided your theory's correct!"

The computer clattered for the fifth time. Katherine whipped round, tore off the tape, read it avidly.

"What does it say?" barked Redwood.

Katherine's shoulders slumped. "Wind velocity will decrease thirty minutes from now. Should remain low for approximately fifteen."

"Hopeless," muttered Redwood. "Far too short. But keep an eye on the computer, won't you? It just might change its mind."

Schultz said, *"Herr Doktor,* forgive me, but Venus is a dead world. Your creature, it strains my credulity."

"I'm not so sure. It travels, remember," Redwood pointed out.

Collins nodded. "Yes, it does. It must flow through interstices in the crust, quite likely absorbing mineral nourishment directly from the rocks. Maybe it can inhabit only the porous layers, or maybe it eats away any rock it touches, leaving behind a—a sort of vast stone sponge."

"Whew!" Tanner gave a soundless whistle and glanced apprehensively at the window. "How does it do it? Move, I mean. What does it use for muscles?"

"Contractile fibers, I suppose. They could form a network in the membranes, a bit like veins in a leaf, but on a"—Collins spread his arms as wide as he was able—"on a colossal scale."

"They'd need to be incredibly strong," said Redwood, conscious that Tanner and Davidson would be braving those fibers if they really did exist, and if the wind diminished.

Collins looked at the adapter screen. He suppressed a shudder. "Oh, they are, they are. As you can see."

Everyone looked, and did indeed see: a sheet of oil, and under it something unthinkably gigantic and powerful, coiling and squirming, hell-bent on their annihilation.

Tanner said in a muffled whisper, "For heaven's sake, Andy and I will be wading *through its flesh!"*

Time to alter the trend of the discussion. Quirking a casual eyebrow, Redwood asked, "How can the creature orient itself so it doesn't go charging off in the wrong direction?"

"It doesn't *charge,"* Collins said in a brittle tone. "As for orientation, its sensory equipment must be utterly different from ours." He eyed the magnetograph. The obscuring echoes were fading out . . . or aligning themselves with the main beat of the pulse. Did this mean that the creature was focus-

ing on the scaphe more accurately, the better to destroy it? Collins continued tautly, "That thing out there obviously has a magnetic sense, and God knows what else beyond our imagination. It may have some means of locating nutrient ores. Certainly it can pinpoint causes of disturbance."

"Such as the drilling complex." Redwood frowned thoughtfully.

"And the research unit."

"But that's four hundred miles away!"

"This creature's *big*," Collins reminded him.

Davidson re-entered the debate. "The research unit was trying to harness magmatic heat as a power source. You think their experiments may have given your creature . . . an itch?"

"It's conceivable, Can't you visualize the thing oozing along crustal faults, scratching the itch, then slithering home?"

Davidson's mouth crinkled. "I can if I must." He glanced at the telescan screen which showed the workshop, and added grimly, "Now it's scratching us."

They all followed his glance. The workshop wall holding back the oil showed a very slight, but ominous, bulge. The charred patch had expanded to engulf the entire wall. The blackish crimson stain had swollen into a giant eye whose pupil was a dully glowing splotch of cherry-red.

Collins looked at Katherine. She would soon be smashed to pulp and frizzled to a crisp. All because he'd bungled his scanner readings. And she would die believing that he hated her.

As much as she hated him.

It is a peculiar feeling to know that one is hated; peculiar, and singularly unpleasant. Collins could have wept over the absurd futility of their dying before he'd had a chance to put matters right.

Redwood broke into the tense silence before fear could crescendo into panic. "I still can't get the hang of this beastie—whose existence, remember, hasn't yet been proved. But if it really is a living entity, then presumably it has a brain, and brains can be destroyed!"

Collins shook his head. "It's so huge that it must have innumerable brains—or rather sub-brains—acting independently or uniting to work as a whole. There's no other way it could correlate the activities of the different parts of its body." He tried to smile. "We could never locate all those sub-brains, and destroying just some would be useless. Worse than useless; all we'd do is infuriate the creature still more."

Schultz strode to the window, glowered through turgid veils of sand; then swung back to speak to them, his voice harsh: "Can we not suffocate this—how do you say—*verfluchtige Teufelsbrut?*"

"Accursed devil's brood," Davidson supplied.

"*Ja, ja,* accursed devil's brood. If it's that gigantic, its oxygen requirements must be tremendous. If we can cut off its supply of—" Schultz stopped dead, eyes widening.

Redwood slapped his thigh. "Oxygen by God! But there's almost no free oxygen on Venus. Even if there were, it wouldn't be available underground. Dr. Collins, there goes your whole wonderful card-house—puff—blown flat by one word!"

"I wish that were true," Collins told him. "You're forgetting the oxides in the rocks and the acids in the atmosphere. The creature could concentrate acids in its system and use them to dissolve rock for energy as well as for food."

Redwood forced himself to relax. Collins could lip-read his stifled imprecation, *damn, damn, damn.*

Tanner said wretchedly, "Anyway, why should a Venusian creature need oxygen in any form? It isn't related to oxygen-breathing Earth-creatures. Why should it follow Earth-life's pattern?"

"Why indeed?" Davidson murmured wrily.

"And besides—"

"Enough." Redwood wanted no more gloomy speculation. "It's time we informed Orbital Station Two of our theory. Your theory rather, Doctor." He smiled acknowledgement and added privately, *In case we don't survive.*

Forestalling further comment, he turned to the control-board. Gone was all trace of his momentary lapse into emotion. He was in command of himself, apparently immune to the horror of their situation.

The computer clattered, making Collins jump violently. Katherine ripped off the tape, read its message aloud: "Wind velocity will decrease twenty minutes from now. Should remain low for approximately one hour."

Redwood gave a thumbs-up sign to Davidson and Tanner. "This is it, chaps. Off you go. Good luck." His voice gave no hint that he knew he was sending them to almost certain death.

Sealed inside their suits, the aging man and the young one clumped out of the flight cabin. Redwood followed their progress on the internal telescan screens, raising each safety door as they approached and dropping it behind them. Now and then he glanced at the screen which showed the workshop. The giant eye on the bulging wall had paled to a fierce orange; it was larger still, and radiating like a miniature sun.

Davidson and Tanner entered the workshop. Beside the melting wall, one final door barred their path. Beyond it massed the oil.

Redwood spoke into the cabin transceiver: "Stand by, you two fellows. I'm about to turn the work-

shop into a makeshift airlock. Remember: as soon as that last door opens, the oil will come slamming in. So grab hold of something and hang on for dear life."

The men in the workshop maneuvered themselves clumsily into position. When they were ready, they told Redwood over their suit transceivers.

Redwood pressed the button which opened the last safety door. Immediately he punched the "close" button, holding both down to lock the door ajar.

The air in the workshop, Earth-air rich in oxygen, had not been extracted. Collins watched the telescan screen in horror. High pressure oil exploded from the gap between door and floor. Spraying over ceiling, walls, and men, it ignited. Davidson and Tanner staggered amid flame-thrower jets of blazing oil, themselves ablaze. A single cry burst over the radio, was cut short sharply.

In one bound Collins was at Katherine's side. Wrenching her out of her chair, he crushed her face against his shoulder and covered her eyes with his hand. "Don't look! Don't look!" he shouted.

The fire gobbled the last scrap of oxygen; guttered out. The workshop became a boiling blackness of smoke and oil and virulent atmosphere.

Redwood hit the transceiver switch, called out: "Andy, Tanner, can you hear me?"

Two shaky responses came back over the radio.

"Are you all right?" asked Redwood.

They were, just, they replied.

"Good. In that case I'll finish raising the door. Stand by."

Collins whispered unbelievingly, "They're alive. But . . . I saw them die. *I saw them die.*"

"No," Redwood told him with unexpected gentleness. "You saw them swathed in flame, but don't forget, the suits we wear on the surface are fireproof. They have to be. The temperature is so high that the whole planet would be one huge fire if the atmosphere contained enough oxygen to sustain combustion."

This was not strictly true; only flammable materials would burn; but in the present circumstances a little poetic license was justified.

Katherine stirred. "You know that already, Chris—about our suits being fireproof. You must do."

Of course he did, Collins recollected; but the shock of the moment had driven it out of his mind. He found that he was clutching Katherine convulsively. He tried to release her. His muscles refused to respond.

Redwood rubbed a hand over his sweat-shiny face, inspected it, wiped it on his trousers. "It isn't easy to watch men burn," he remarked. "Even when you know they're safe. At least from the flames."

Davidson's voice clawed through machine-gun bursts of static: "Commander, our faceplates are covered in oil. We're cleaning them."

Redwood leaned toward the transceiver's mouthpiece. "When you've finished, dismantle the gear on the platform, then jettison it. Don't attempt to salvage anything. Get back inside the scaphe as fast as you can."

As soon as their faceplates were adequately clean, Davidson and Tanner moved forward. The oil tugged at their boots, wrapped around their knees. Slowly, fighting every slippery inch of the way, they waded through the dispersing smoke toward the murky twilight which glimmered beyond the doorway, beyond the ragged hole which once had been an airlock.

Redwood looked at the wall-clock. The lull-sequence had just begun. He looked at the adapter screen. Davidson and Tanner were emerging into its field of view. And they were in trouble—trouble aggravated by their exposure to the still savage blast of the storm.

Redwood depressed the transceiver switch. "You two out there, don't move together. Move one at a time, with the standing man supporting the man who is moving. And lift your feet right out of the stuff for each step."

Davidson's voice reached them through another crackle of static: "Easier said than done, sir. There's a sort of greasy skin over the surface, fragile in some directions but incredibly tough in others. And underneath, where we can't see them, there are obstacles, stringy fibers that keep flexing and contracting, throwing us off balance."

Collins caught his breath. Abruptly he thrust Katherine aside. He made for Redwood, caught him by the shoulders and shook him as hard as he could. "It's alive! It's alive! I knew it! I was right!" he shouted, almost hysterical with excitement.

"You certainly were," Redwood agreed. "Please let go. You're making my teeth rattle."

Collins gasped, "Jesus! My instruments!" He dived for The Maestro's Corner, galvanized by the need to keep track of what was happening underground.

Tanner and Davidson dismantled the pump. Frequently they were forced to wait, clinging to it, while gusts assailed them—minor gusts not fierce enough to hurl them to their deaths.

Finished, they floundered to the next piece of equipment, all but invisible to them through the driving sand. Agonizingly slowly they dismembered it, tumbled it over the edge of the platform.

They struggled grimly to the next item.

Katherine said, "Commander, they have twenty minutes left before this lull-sequence is due to end."

"I know," Redwood told her. "Keep checking with the computer in case the situation changes. If it does, tell me at once."

Tanner and Davidson were tiring fast, and Davidson's age was against him; yet it was Tanner who misjudged the position of the platform's edge, hidden as it was beneath the rising oil-tide. The flight cabin rang to his terrified yell as, in grotesque slow motion, he sank from the watchers' view.

Collins, jolted from immersion in his instruments, spun around. He watched Davidson grope for Tanner, haul him onto the platform, stand him on his feet; then double over as far as his suit allowed, fighting for breath. When Davidson straightened again, his faceplate was black and white: black where oil had smeared it, white where flying sand-grains stuck to the oil and clung tight.

Davidson was now half blinded. Tanner, who had been totally submerged in the viscous muck, was as sightless as a stone. There was no question of their being able to clean their faceplates in the open.

Collins returned to his instruments—those still able to work under the flooding oil. He checked the scanner. The oil-field was contracting almost visibly. He checked the magnetograph. The rhythmic pulse was even more rapid, and the obscuring echoes were gone.

Redwood was saying to Davidson, "Can you manage alone?"

Davidson, already fumbling under the oil for the next bolt, replied breathlessly, "Yes."

Collins interrupted them: "Commander, please tell him to hurry."

Redwood relayed the message.

Davidson answered in anguish, "Sir, I can't go faster."

Collins said, "He *must.*"

Katherine broke in: "Commander, their time is almost up. They should come back inside the scaphe."

Redwood asked her, "Exactly how many minutes have they left?"

"I don't know. The computer can't predict the precise moment when the lull-sequence will end." Her glance flicked to the wall-clock. "*Please* tell them to come back."

That message was lost in a screeching burst of static. Redwood repeated it, shouting.

Davidson bawled back, "There's only one more container to be—"

"Leave it," ordered Redwood. "Get yourself and young Tanner back inside the scaphe. Immediately!"

Davidson gripped Tanner's arm. He guided the younger man onto the storage area. Incandescent sand was piled in a sizzling oil-soaked drift against the hull.

Schultz said quietly to Redwood, "One container still is attached to the platform, which therefore cannot fold up. That means we can't escape."

Redwood said, "I'll wrench the platform free."

"Is that possible?"

"We'll soon find out."

"Ah, so." Schultz rubbed his chin dubiously. "I think I know what you're planning. The engines won't like it, not at all. I keep watch, warn you of trouble, *ja?*"

"Please, Heinie."

Schultz made for the alcove which housed the computer readout station.

Davidson was helping Tanner to scramble over the twisted shards of torn alloy which were all that remained of the airlock.

Collins said urgently, "Tell them to make for the suiting-up cabin. If they strap themselves to the locker rails, they may be fairly safe."

Redwood nodded. Of course. When—if!—he raised the platform, there would be loose equipment tumbling everywhere. Besides, who could guess what the oil might do next—crazy oil, which supported a living entity?

Over the radio rasped Davidson's voice, so hoarse from his efforts that it was barely recognizable: "All set, Commander. We've dug in as securely as we can."

"Good." Redwood reached for the starter keys. "All hands, alert. I'm about to try to raise the platform—"

"No!" cried Collins. "First seal off the workshop so that the oil inside it can't escape!"

Redwood glared at him. "Are you mad? We'll be killed if we take off with a load like that on board!"

"It's vital that we hang on to that sample."

"It's vital that we stay alive. Dr. Collins, one weak internal wall separates the workshop from the engine-room. That wall is already under unacceptable strain. If it ruptures, we can kiss good-bye to our engines, our power plant, our life support systems. Do you want to choke and fry and scream out your life from scalded lungs?"

Collins' glance wavered, then steadied. "Obviously not. But it's a risk we've got to take."

"Now look here—"

"*You* look here! Men have died investigating this world's oil. Equipment worth millions has been wrecked. Yet the bigwigs deemed it important enough to send us to carry on—"

"And we've made a stupendous discovery, granted—"

"But where's our *proof?*" Collins voice skidded up the scale. "In the workshop, that's where it is! And you're proposing to throw it away! Don't you see, if you do, this mission will be a failure! The hard work, the skill, the obliterated lives, the money, the resources, all will be wasted . . ."

Collins broke off. He drew his sleeve across his forehead. More quietly he said, "Look at me, Commander. Do I look like a man who

wants to die? Do you think I want"—his voice caught—"Katherine to die? I know what I'm asking. I'm asking you to fly this scaphe with a time-bomb ticking away in its guts. If that bomb explodes before we reach orbital height, that's our antigravity gone and we shall drop like lead. If it explodes later, we shall die more slowly but just as surely and a damned sight more unpleasantly. Yet still I'm begging you to lower that safety door and trap that oil in the workshop. It's important, Commander. We've got to go home with tangible evidence."

"We have it. Your notes. Our observations."

"They're not *tangible!* We need the actual tissues right there under the noses of the skeptics. Without them, experts will poke holes in our findings. The first flush of enthusiasm will fade. Disbelief will spread. Biologists will advance irrefutable arguments to show how we must have been deluded. We'll end up back on Square One."

Silence. Katherine's face was a mirror displaying fright. Schultz's was a closed mask, concealing everything.

Redwood swore under his breath. He reached for the button panel, said: "You're very eloquent, Doctor. You've made your point. I'll do as you say. But you do realize that we can't change our minds later? There's no way we can dump the oil once we're in flight."

"I understand." Collins gave a fleeting smile. "One final request? Slam that door down quickly, and I do mean *quickly*, then get the scaphe aloft as fast as you can."

Unheard by the men in the flight cabin, the safety door clanged shut. Unseen, the amputated oil seethed in the ruined workshop as though gathering its energies for a final assault.

Redwood turned the starter keys. Far off, engines began to whine. The platform rose a short distance, stopped. Redwood pulled on a lever. The whine crescendoed to a howl. The platform jerked a little higher.

Over the radio, from the suiting-up cabin, came sounds of struggle. Davidson and Tanner were caught in an oily undertow. Swirling and sucking, it ate through their safety straps, swept them from their anchorage on the locker rails.

Collins listened. He looked at the scanner screen. He began to tremble.

Redwood nursed the lever, gentling it from one position to another. He called, "Heinie, how are the engines taking it?"

Schultz grunted, "OK."

On the storage area, a tube of heat-proof alloy tore from its housing. Recoil sent its broken end lashing to and fro like a snapped spring.

Collins said, "Commander, get us away."

"I'm doing my damnedest."

"Not enough. The oil-field is imploding toward us. *Get us away.*"

The sounds from the suiting-up cabin intensified. Tanner and Davidson were fighting for their lives.

Redwood refused to hurry. Sweat dripped from his chin.

The floor of the flight cabin began to vibrate. The howl climbed an octave. The platform lifted, dropped, lifted again erratically, juddering and grinding.

Schultz could be heard muttering in German, the same phrases over and over again.

The howl soared to a high-pitched scream. Katherine covered her ears. The container ripped free. Ponderously it keeled over, slopping oil. A jagged tangle of bent bolts and severed piping heaved toward the sand-solid sky.

The platform crunched home. Oil-slimed and glistening, it formed an outer hull once more. Redwood threw the master switch. Sluggishly the scaphe lumbered up off the ground.

The ground climbed after it.

In a single jump, Collins was out of his seat and peering downward through the window. Below the sand-storm he glimpsed the dim suggestion of a shapeless shadow, shifting and obscured. Into it splashed clots of oil from the base of the scaphe.

Oil? The life-juice of a nightmare monster.

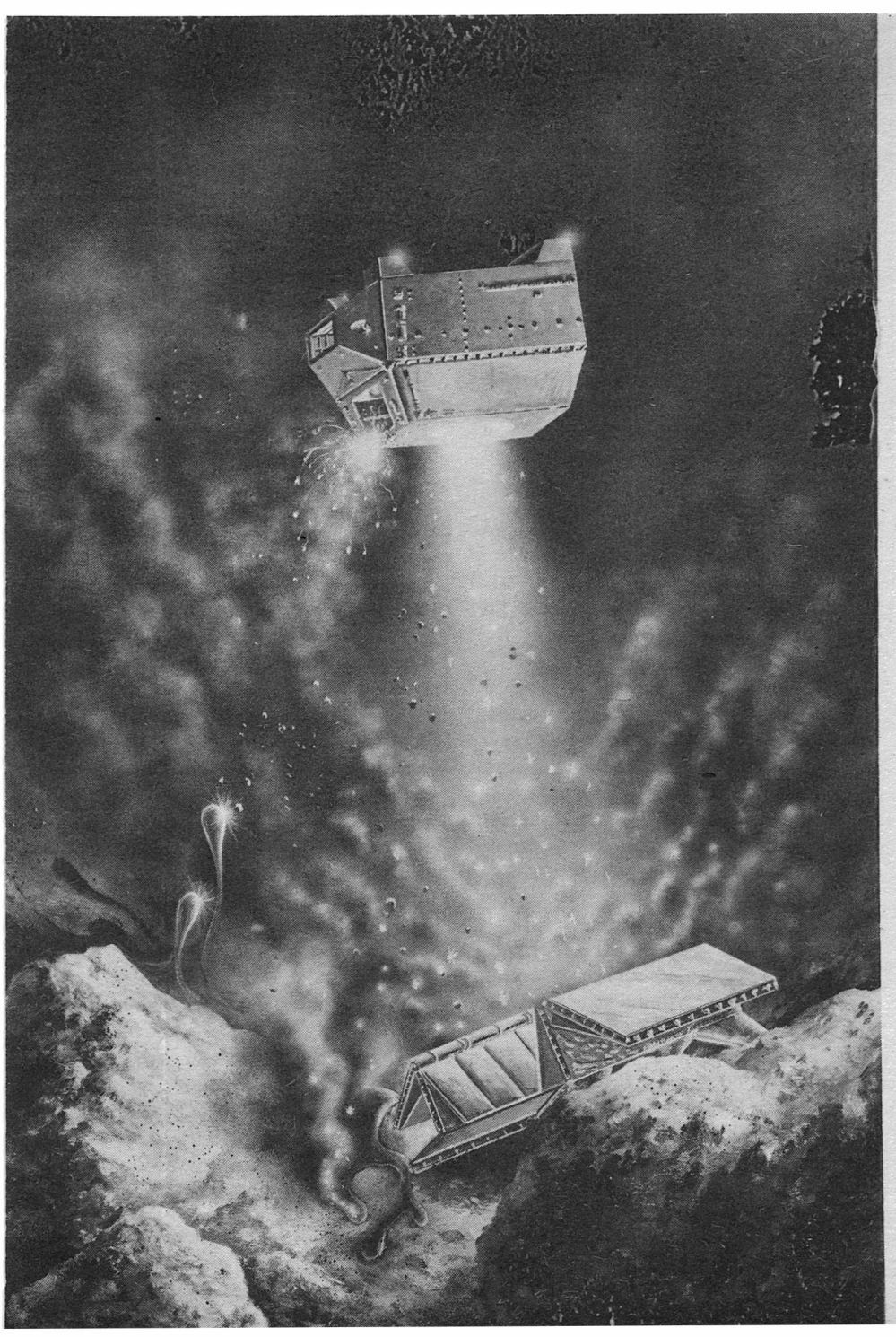
Redwood, watching the adapter screen, saw the scene unobstructed by sand: a scene of oil defying the law of gravity, swelling and bunching, humping into a pyramid from whose apex an extrusion quested after the scaphe like a vast blind snout.

Katherine crept into Collins' embrace. She pressed against his hard, wiry body; felt herself clasped tightly in return. "One thing you were wrong about, Chris," she said, shaken. "'You thought the thing might not be fully sentient. It is. Look at it: rage and agony on superhuman scale!"

The questing snout collapsed. The pyramid dissolved. All that remained was a lake of oil, undulating, draining slowly, slowly down the borehole. The sand-poultice gummed to its back began to buckle and split. One ragged patch oozed fresh dark oil—the site of the amputation.

The human marauders' troubles were not over.

Through sandstorm, through smog, through layer after layer of corrosive cloud, the unwieldy bulk of the scaphe swam upward like an untethered mountain. The sun hung halfway down its slow slide toward its setting point in the east. Huge and rayless it swung in the upper left corner of the adapter screen. Later it loomed through the window, a dingy red stain seeping through yellow acid vapor. Swiftly it brightened: ruby to liquid pearl; pearl to blazing silver; silver to an



iridescent glare—at which point Redwood closed the shutter.

And promptly was asked by Katherine please to open it again.

He did so, warning everyone to be sure to keep out of the sun's direct light.

In the suiting-up cabin, Davidson and Tanner sprawled like broken dolls on the floor: safe, but prostrated by exhaustion.

Schultz said, "Commander, a number of computer circuits are on the blink."

"Can you put them right?"

"Not from here. I'd like to go down to the engine-room."

"That won't help."

"Probably not. All the same I'd be happier down there, seeing for myself. Just in case."

Redwood needed every erg of power his engines could provide. He also wanted a good man to stay alive. He eyed the internal telescan screens. The wall separating workshop from engine-room showed no sinister blackening on the engine-room side. The trapped oil was losing some of its heat.

But none of its pressure.

Schultz said again, *"Commander!"*

Redwood gestured assent. "Very well. But take care!"

Schultz gave a brief grin. His skin would be the one at risk. "I will, sir," he promised, and left. Redwood checked him through the safety doors.

The scaphe mounted the topmost cloud-layer. Palest gray and blinding white, sparked here and there by sunlight into prismatic gleams, the soft wisps of vapor coiled against an indigo backdrop swarming with jewel-vivid stars.

Redwood spoke to Schultz over the intercom: "Found what's wrong, Heinie?"

"Everything's running hot. Much too hot."

"Can you do anything about it?"

"Well . . ."

That meant no.

"I want you out of there," said Redwood. "Come back to the flight cabin."

"Have we reached orbital height?"

"Don't argue. Come."

The cloudscape sank away below the scaphe. Far, far down, tiny and growing ever tinier, a circular rainbow went dipping and wobbling over fluffy white scarps and shadowy canyons.

Schultz rejoined the three in the flight cabin. His face was drawn and bloodless, his clothes sodden with perspiration. He staggered slightly, and nursed a hand burned raw by contact with an overheated catwalk rail.

Redwood said, "Katherine, see to him, then be a love and rustle up some tea. We could all use a cuppa."

In the abandoned engine-room, the air grew increasingly sour, fume-laden, poisonous. In the imperiled wall, chemical bonds were

loosening, joints under stress were distorting, overstrained alloys were changing their character.

Katherine dressed Schultz's burns. Nearby, Collins stood poised over the first aid kit; he passed the woman what she needed.

"Nearly finished," Katherine told Schultz soothingly. "Just one finger more. Can you straighten it?"

"I'm going to faint," said Schultz.

She pushed his head between his knees.

Redwood sent an SOS to Orbital Station Two. "We're likely to need an emergency tow," he said. "What was that? . . . No, sorry, I can't give you a more precise fix on our position. My navigator is unavailable."

Schultz began to recover. He shrugged off Katherine's grip, raised his square blond head, braced his chunky shoulders. Ashamed of showing weakness, he apologized.

"That's all right," said Katherine, and resumed work on his hand. "Chris, the scissors please. *Almost* finished."

The horizon curved more and more strongly as Venus fell away from them.

Schultz smiled his thanks at Katherine and Collins; adjusted the sling looped around his neck and wrist.

Katherine packed away the first aid kit she had used. Normally she was not squeamish, but the engineer's hand had been an ugly mess; she felt sick with reaction.

Two decks below the strained wall burst.

Vertigo rippled through Collins. He grabbed the table's edge as his feet drifted off the floor. The first aid kit rose, hovered six inches from his nose, tilting slowly, floating free.

They were weightless.

"That's it," said Redwood, prodding the now dead controls. "No more engines. No more power supply. No more gravity neutralization. No more life support." He pulled a red-painted handle once, twice. "No more emergency circuits—they're kaput as well. So no more cozy chats with Station Two. OK, you three, safety-harness on except when you need to move about. Katherine, stow that first aid box before it brains someone."

Schultz repeated his earlier question, urgently: "Have we reached a safe orbital height?"

Redwood turned around, met the German's eyes. "No, we haven't. So cross your fingers, Heinie, and pray to God that the rescue craft find us before we turn into a meteorite."

Five revolutions later the scaphe's orbit was decaying. The air in the flight cabin was growing foul but, thanks to the scaphe's massive exterior shielding, not unduly cold.

Torn between hope and despair, everyone watched as, again and again, the terminator crawled across the expanding planet, paring it to a spheroid, a half-moon shape, a crescent, a glittering curved line. Five times, as total darkness engulfed Venus, they saw a hoop appear—a vast hoop of greenish light separating the solid black of matter from the star-shot black of space.

The hoop was the atmosphere, excited into shimmering luminosity by the radiation of the eclipsed sun.

The air grew fouler still, and cooler. Deep in shock, Schultz huddled in the blanket which Katherine had wrapped around him. He was shivering in convulsive spasms.

Redwood said, "Heinie, I think you should take an analgesic."

Schultz shook his head decisively. "Thank you, no. If I am to die, I prefer to do so with my wits unblunted."

Redwood was silent, thinking, then eased down in his harness—and was suddenly the image of a man on holiday: lounging languidly, all angles and sharp points, one knuckly hand clasped loosely around the ankle crossed over his knee.

"Fair enough," he said in a conversational tone. "Me, now, I'm hopping mad at the prospect of dying while I'm still agog with curiosity. Dr. Collins, let's hear more about our friend down below. Its life-cycle, for instance. How does it reproduce? My mind boggles at the idea of a thing that size coupling with an equally colossal mate!"

Redwood's calculated crudeness provoked laughter—the raucous, out-of-proportion laughter which accompanies the release of tension.

"I doubt very much that the oil-dweller reproduces sexually," Collins said when the noise subsided.

"How then?" asked Redwood.

"Probably by budding or dividing."

"H'm. And the infant migrates to pastures new, filching some of the parental oil-field to set up house—Mama permitting?"

"Probably," said Collins with a grin.

"Dividing," mused Katherine. "That means that the separated section contains muscle-fibers, nerve-fibers, oil-filled sacs, and presumably at least one sub-brain." She stared at Collins; her face grew vivid with dismay. "Suppose the section we've imprisoned contains a sub-brain? It'll be still alive. And active. And murderous."

"No," said Collins at once. "The cold will have killed it."

"How can you be sure?"

Collins didn't reply.

The mood of levity engendered by Redwood melted like a snowflake in a kiln.

Collins hunched in his chair, at a loss where to look. He dared not meet his companions' eyes; they might read the desperation in his own. He tinkered with his in-

struments. Dead, all dead. He drew a sheaf of printouts from a drawer under his table, ruffled it, put it back. He delved for the scanner flimsies, examined them without method or real interest. He simply needed something—anything—to do.

Redwood said, "Those scanner diagrams: am I right in thinking that they show exactly *when* the oil-field started to contract?"

Collins froze into a picture of guilt. "Yes."

"Let me see."

Minutes later Redwood was pawing through them. Katherine unclipped her harness and joined him, followed by Schultz trailing his blanket and hugging his burned hand to his chest. Anchoring themselves to cleats on the control-board, they pored over those telltale diagrams, discussing the discrepancies.

Collins listened, outwardly calm, inwardly in torment. Sooner or later one of them was bound to ask, "How come you failed to sound a warning the moment the discrepancies appeared?" What answer could he make?

Redwood stated, "One thing's clear: the oil-field started contracting, imperceptibly at first, as soon as we started drilling."

There: the Commander had spotted Collins' negligence. His words proved it . . . didn't they? Collins waited, sweating.

Schultz nodded. "*Ja.* And the contraction speeded up at a rate almost exponential. Amazing, not so?"

"Yes indeed." Redwood glanced at Collins. "What do you think, Doctor?"

"Um, I—I agree." Collins studied the flimsies, feigning intense concentration. He could feel the Commander's penetrating gaze on his face. He thought, *He does know. Oh God.*

Of course Redwood knew. He was no fool. Earlier he'd reprimanded Collins and Katherine for their dangerous absorption in each other. He'd known all along, but (a shrewd guess) he wouldn't tell. In his view, official censure was unneeded; Collins' conscience would inflict the harsher punishment.

Others, less charitable, who spotted Collins' negligence later, might take a different stand.

Later? Face it, thought Collins; there wasn't going to be a "later." Their imminent re-entry into the atmosphere would turn them all into a streak of fire.

The sun glared for the sixth time through the window, swiftly climbing the sky as the scaphe hurtled down its ever tightening spiral toward the white ball glistening below, so pure, so ethereal, so lethal.

For the sixth time, darkness devoured Venus—darkness made glorious by the immense, vibrant, greenish hoop of atmosphere-refracted solar radiation.

The hoop reeled crazily as the scaphe gave a sudden lurch. Weight

returned, making everyone stagger.

Redwood was the first to recover. "We're saved! We're saved!" he shouted, grinning fit to split his face in half, euphoric with relief.

The scaphe's catastrophic downward glide was ended. Rescue craft were buoying its crippled mass, snaring it in their gravity fields, lifting it toward the bright star that was Orbital Station Two.

Schultz swung his good hand against Collins' back, a hefty whack which all but knocked the smaller man off his feet for the second time in as many minutes.

Katherine wailed, "Those two trapped below: we don't even know whether they're still alive, but if they are they'll have felt that lurch, and they'll be terrified, and there's no way we can tell them all's well . . ." She dissolved in tears.

One Earth-week had passed.

Collins drank the last of his coffee, parked his cup on the arm of his chair, settled himself comfortably. For the last time he was seated among Redwood's erstwhile team in the briefing-room of Orbital Station Two. He had just finished expounding the past week's findings.

"So you were proved right. The oil-dweller definitely is a living organism." Redwood beamed. "Congratulations!"

"Thank you," said Collins, trying not to look smug.

"We've certainly had an interesting time," mused Davidson. He and Tanner had been rescued from the suiting-up cabin, unharmed except for bruises and pulled muscles. They had been shielded by their suits from the atmosphere, from vacuum, from the effects of the failure of the scaphe's life support systems.

The day after their rescue, an airlock had been improvised to open into the workshop. Collins had passed through it, in charge of a group comprising Davidson and those few scientists who had evaded death in the wrecked surface installations. Wearing heavy-duty surface suits, Collins and his helpers had worked fourteen hours a day inside the ruined area of the scaphe, examining the oil-dweller's amputated tissues *in situ* in order to protect them from explosive decompression—a fate which had destroyed any tissue fragments present in the samples obtained by earlier missions.

It had been a thoroughly unpleasant, claustrophobic and exhausting job. Thankful that it was finished. Collins said, "We've gone as far as we can by ourselves. Now it's the biologists' turn, poor mugs."

Davidson grinned around the brand-new match-stick clamped between his teeth. "And the nearest 'poor mugs' are on Earth. Careful, Doctor—your coffee-cup! That's the second time it's almost taken wing."

"Is it?" said Collins vaguely, his mind on his impending return to Europe. There would be much explaining to do, plus a little explaining away. Those scanner diagrams! He would need to hammer home how fortunate it was that the team hadn't retreated aloft at the first sign of trouble. Instead, they'd bravely stuck it out, thereby obtaining irrefutable proof that Venus was a living planet. Yes, that was the line to plug.

Collins relaxed. He was a dedicated scientist, too dedicated to entertain for a single instant the idea of slanting the evidence, even if he could have got away with it. But he was also human. He liked acclaim, not blame. He intended to protect his reputation.

"I shall be most sorry to leave here," Schultz said glumly. He also was destined for Europe. For hospital, to be exact; his burned hand needed treatment beyond the sick-bay facilities of Orbital Station Two.

"You'll be back before long, I expect," Collins offered comfortingly. He glanced out of the briefing-room window. He could see, slicing across the tar-black sky, the blunt silvery nose of the Earth-Venus shuttle. In it he and the German would shortly be traveling, accompanied by the oil sample which even now was being pumped from the scaphe into a high pressure container attached to the shuttle's stern.

Redwood wriggled down in his chair (the largest in the room) until he was lazing luxuriously, long legs asprawl. "It still staggers me that such a hell-hole can harbor life," he remarked, jabbing a thumb toward the floor. "Just think of the implications!"

"Not so sure I want to," Tanner said with a cheeky grin.

"What, a bright young lad like you, doesn't want to? Shame! You should be bursting with way-out ideas!"

"I am, but they aren't fit for general consumption."

"Rubbish. Out with them! We're all ears."

"Well, sir, research on the surface promises to be difficult in future, even more so than at present." Tanner dropped his bantering tone. Soberly he went on, "That oil-creature is wise to us. It knows we're its enemy, probably the only one it's got—unless you count tectonic events, quakes, volcanic eruptions and the like."

"Whoa, stop!" interrupted Redwood. "What makes you think that the creature lacks organic enemies? No life-form exists in isolation. Our beastie must have evolved from increasingly primitive ancestors, each of which will have spawned a family of diverging forms. Eh, Dr. Collins?"

"Oh yes, undoubtedly," Collins agreed. "The oil-dweller's mere existence presupposes an infrastructure of living things, some

of which may well be inimical to it. Micro-organisms, for example. Mind you, no trace of such things has been found to date, but now that we know what to look for . . ." Collins waved an enthusiastic hand and knocked his coffee-cup to the floor. "Bloody hell! Beg pardon, Kate. As I was saying"—he rescued the coffee-cup—"now that we know what to look for, the most fascinating finds should start whistling in from all directions. Good God, an *entire world* is spread there below us, begging to be explored! It could prove to be a seething cauldron of life-forms, possibly all subsurface, certainly all utterly different from anything on Earth."

Katherine broke in vehemently, "The oil-dwellers must be protected."

"What?"

"Protection: they're going to need it badly. Man wants Venus' oil, and what Man wants Man takes. That means the ultimate destruction of the oil-dwellers' habitat and the extermination of the oil-dwellers themselves."

"Surely not!" Collins protested. "Once it becomes known that life exists on Venus—"

"The Conservationists will demand that the planet be closed to exploitation. Banners will be waved. Fists too, probably. By the time the dust settles, the oil-dwellers will be extinct." Katherine was quivering with the intensity of her emotions. To her, since the destruction of the child in her womb, all life had become sacred.

"Nonsense," snorted Collins. "Public opinion would topple any government that tried to—"

"Oh Chris, don't be so naive! Since when did idealists win out over government policy?"

"Screw idealists, I'm talking about the man in the street. Ordinary people would never allow—"

"Ordinary people won't get any say in the matter," snapped Katherine. "Even if they did, what makes you think they'd care a hoot what happens on an alien world? Half of them don't even care what happens next door."

Collins' jaw set stubbornly. "Balls. When something fires their imaginations—"

"My dear Chris, most of them haven't GOT imaginations. Most of them—"

"Will you please shut up and let me finish my—"

"—are interested chiefly in their health, their children, their livelihood, their food, their pleasures. The egg-heads' antics out in space mean nothing to them. As for grisly alien monstrosities, if those get lost in the shuffle, good riddance! That's the philosophy of the bulk of mankind."

"No, no, *no!* It is *not!* Jesus, but you've grown cynical—"

"I'm not cynical. I'm realistic," Katherine retorted, and changed her ground. "Besides, human af-

fairs tend to develop a momentum all their own. Once under way, they can't be defected—particularly multi-billion prestige projects like the Moon. Haven't you noticed that?"

"Well, yes—yes, of course! But even so, no thinking person would permit—"

"Who says people *think?* Look at you! Spluttering with rage in your ivory tower, blissfully ignorant of human nature—"

"I'm not spluttering!" spluttered Collins, furious.

"No? Then you're doing a splendid imitation."

Redwood unfolded his lanky frame from his chair. "Come, chaps," he said to the other men. "Let's leave this pair to squabble in private, eh?"

Collins and Katherine were startled into silence. They had forgotten that they had an audience. Katherine was the first to recover. Flushing, she said, "No, please, we've finished, we—"

Redwood bit back a grin. "Finished? It sounded to me more like you were just getting nicely started. I'd hate our presence to inhibit you." He winked broadly at the others. "Out, you lot." He shepherded the men to the door.

When they were alone, Collins and Katherine stared at each other. Katherine looked rueful, Collins acutely embarrassed.

Katherine said, "I'm sorry, Chris. I got carried away."

Collins was caught by the beauty of her eyes. A bright deep brown they were, speckled with flecks of amber. He had never noticed those flecks before, nor the dark rings encircling the irises, nor the way the blackly shining pupils reflected brilliant points of light.

His gaze slipped downward, lingered on the vee of pale tan skin framed by the collar of her blue workshirt, halted altogether on her breasts. The sharp buds of her nipples were faintly visible under the heavy cloth.

She was damnably attractive. And only just beyond his reach. One step, and he could touch her, fondle her, embrace her. Nervously Collins glanced at the door . . . then backed away, stuffing his hands into his pockets out of temptation.

Katherine chuckled mischievously. "Please stop looking so pet-

rified. I'm not going to assault you."

Collins exploded into laughter. "Oh, Kate!" he said when he was able. "If you only knew how close it had come to happening the other way around!"

She looked astonished, then interested, then happy. "Er . . . don't take me wrong, but . . . why didn't you?"

Collins hesitated, then said in a rush of candor, "Because I know darned well that you can't stand the sight of me."

"What makes you think that?"

"Isn't it true?"

"No."

Collins' attention was fixed on Katherine Harrer to the exclusion of all else. Venus, scaphe, oil, Redwood and his men: Collins had forgotten them to wallow in sentimental might-have-beens. He thought, *Katherine Collins; that's her real name. Ekaterini Collins.*

Impulsively he blurted, "Is it too late? I mean, when you return to Europe, may we meet?"

Katherine paused. She wouldn't be returning to Europe, not if she could avoid it. Her place was here, in orbit around Venus, doing everything in her power to save its gigantic denizens from the rapacious hands of her own kind.

"Kate!"

The raw emotion in Collins' voice surprised her. She studied the elfin face with its incongruous button nose and its well-shaped brow furrowed at this moment by anxiety. She met the intense eyes. There rose in her a vivid need to hug this man, to comfort him, to assure him that he would never starve for love.

Katherine muffled the impulse. "I don't know, Chris," she sighed. "You and I so often bring out the devil in each other. Besides, it could be a very long time before I'm back on Earth. You'll forget me."

"Never!"

Katherine smiled wrily. "That's a big word."

"I mean it!"

"I'm sure you do. Tell you what: if, when I finally return, you still feel the same, send me a message."

"Where?" asked Collins.

"The Extraterrestrial Sciences Academy in Paris. I'm a member."

He wouldn't do it, she reflected. He might intend to, but somehow he would never find a suitable moment.

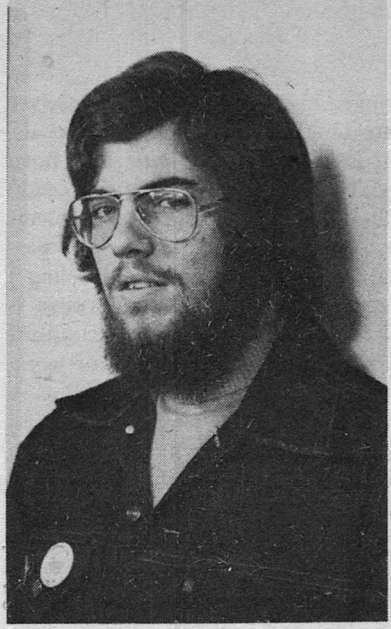
Collins moved briskly forward. He took Katherine in his arms, found her soft lips with his own and kissed her soundly. It was meant to be a brief little peck, indicative of future intentions, but it lengthened. And lengthened. And lengthened.

Eventually he broke the clinch. He grinned at her, misinterpreting her look of quirky humor. "I *will* get in touch," he told her with confidence. "That's a promise!"

One he wouldn't keep. ■

COVER ARTIST: RICK STERNBACH

This month's cover painting, for Brenda Pearce's "Crazy Oil," is the work of Rick Sternbach, a fast-rising young (almost twenty-four) science fiction artist who makes his home in (count them) New Haven, Stamford, New York, Boston, Washington, and Minneapolis—the last address in his capacity as Chief Technical Illustrator for Space Merchants, Ltd. Rick's first science fiction cover was for the October 1973 Analog.
—The Editor



CHARLES DUELFER

Venus is one of those places in the Solar System which looks incredibly beautiful from the outside. But under the clouds, as we know, it is a hellhole.

The atmosphere of Venus is so crushingly dense that, were it clear, it would cause optical distortions unheard of on Earth. The surface temperature is over 900°F, and it is not uncommon for winds to sear the surface at 200 mph.

How could I paint a landscape this alien?

As with any cover, the picture needed visual impact. First, I warped the surface—in keeping with recent scientific speculation about the refractivity of the gases there—leaving the impression of standing in a bowl. Because the dominant colors are red and or-

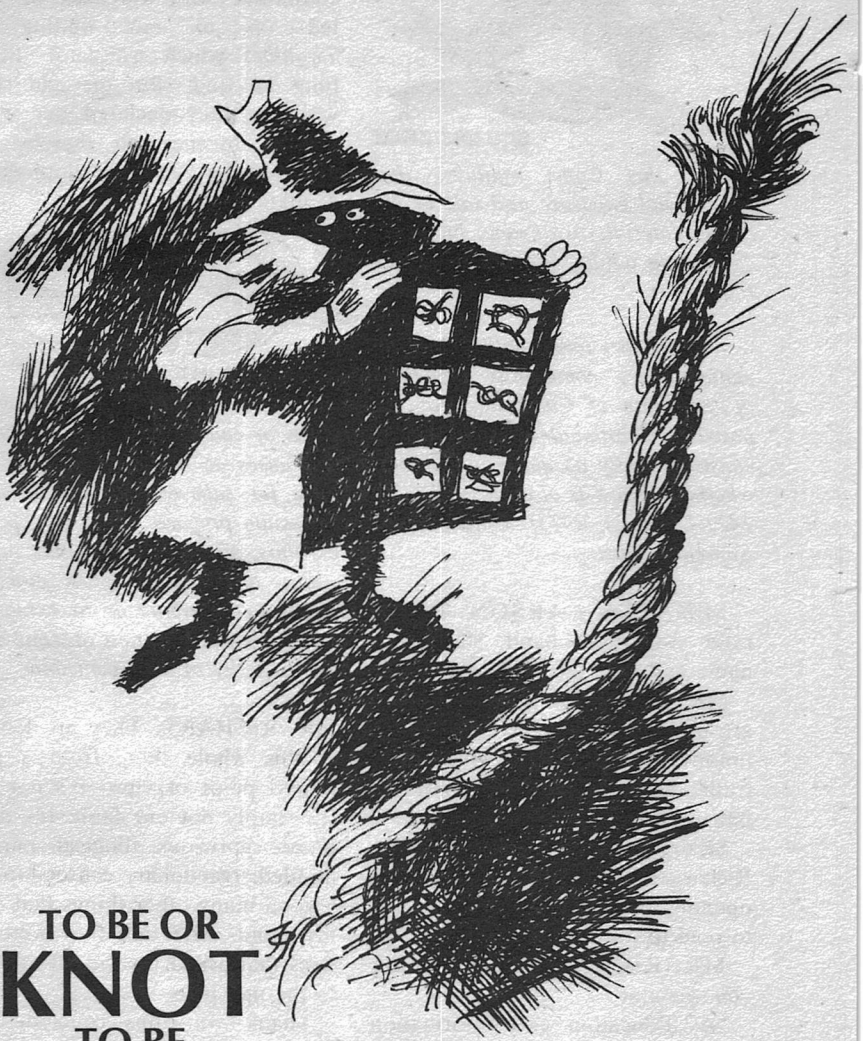
ange, my viewers find themselves surrounded by walls of hot coals. After sitting down with Ben Bova and Analog's art director, Herbert Stoltz, and discussing the problems of fitting the scene to Analog's particular format, the overall feeling I was aiming for was that Venus is *hot,* and obviously not a comfortable place for men to live or work, even when they are protected, as in the story, in pressure suits and an armored bathyscaphe. Both Ben and Herb, upon seeing the original sketch, made snide comments about my interpretation of the bathyscaphe, calling it a "flying dump truck." After all, it was described as a "cuboid" and in some cases I can only paint what the author writes. If it reads like a dump truck it's going to be painted like a dump truck. Nonetheless, the result was satisfactory all around.

Contrary to expectation I put aside the airbrush, the instrument which normally is my major tool and with which I have created and destroyed entire worlds, stars, and galaxies at the flick of a lever. I employed it toward the end to spray down large areas of color and specific lighting effects, such as the ship's exhaust trail and background haze, but the rest of the piece involved varying brush techniques for rendering the bathyscaphe and rocky surface.

The medium was designer's gouache (pronounced "gwash"), a water-based paint similar to tempera or poster paints but more finely ground; it can be reworked once dry. Acrylics, on the other hand, which I fear will gum up my nice little airbrush, cannot be reworked when dry (you must cover old with new), but can be melted with an organic solvent, xylene. I am told that xylene, however, tends to dissolve your liver as well. I will stay away from it, thank you.

The fortunate thing for me about living in New Haven, Connecticut, was that I could get into New York on very short notice when asked to do this kind of assignment. This also makes it easy to revise the painting. I spent quite some time discussing brightness and color modifications with Herb and returned a few days later with the changes made. That's how the brush is pushed. In case the readers are not aware of it, the original commission is talked about, a few rough sketches evaluated, and the final board is toyed with before it is sent off to the printers. The reason I bring this sequence up at all is that, very honestly, as one who has recently come into the field, I find working on actual covers and other professional assignments of enormous value as an educational process which art students rarely get until they are "out there."

I thought I'd also leave the readers something from another decade. If you'll look in the lower left-hand corner of the cover . . . that's right. It's a jar of Tang. ■

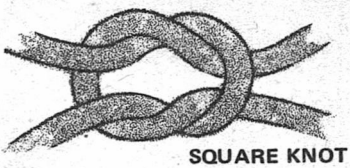


TO BE OR KNOT TO BE

When you try to hold the line,
you often tie yourself down.

ALECS BAIRD

JACK GAUGHAN



SQUARE KNOT

Today, this Court reaffirms that commercial exposure and sale of obscene materials to anyone, including consenting adults, is subject to state regulation.

. . . the Court today holds that "the contemporary community standards of the State of California," as opposed to "national standards," are constitutionally adequate to establish whether a work is obscene. –No. 71-1422 (June 21, 1973). United States Supreme Court.

SENATOR CARSON: Please raise your right hand, state your name and take the oath.

MR. RICHART: I, Albert Richart, do solemnly swear that the testimony I am about to give is the truth, the whole truth and nothing but the truth.

SENATOR CARSON: Now, Mr. Richart, I believe you have a short opening statement you would like to read to the committee.

MR. RICHART: Yes. Thank you, Senator.

"As Education and Information Officer of the spacecraft *Mark Twain,* one of my duties was to act as liaison with the governments, if any, of alien life forms we found.

"I do not want to belabor this committee with a rehash of what led up to our finding the *Twautbes*–which translates 'Beginning To End.' But the end result was that they declared our whole planet obscene and thereby also declared the whole development of Mankind null and void . . ."

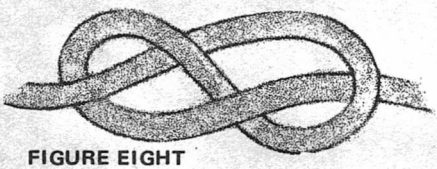


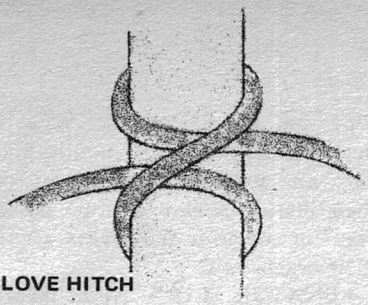
FIGURE EIGHT

(a) Every person *who* knowingly: *sends or causes to be sent, or brings or causes to be brought, into this state for sale or distribution or in this state prepares, publishes, prints, exhibits,* distributes, *or offers to distribute or has in his possession with intent to distribute or to exhibit or offer to distribute, any* obscene matter, *is guilty of a misdemeanor . . .*

MR. RICHART: They are looking at this whole thing from a prejudiced point of view. It's not fair. It's simply not our fault. It's dictatorial, capricious, illogical, narrow-minded, reactionary censorship and a good many other things that cross my mind. After all, they were the ones that asked for the information in the first place.

Thank you, this concludes my opening statement.

SENATOR CARSON: Tell me, Mr. Richart, your craft's trade exploration had not been going as well as hoped. Why?



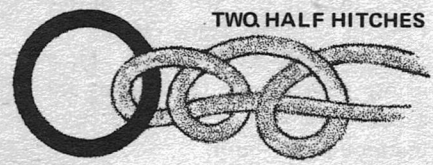
CLOVE HITCH

(c) "Person" means any individual, partnership, firm, association, corporation, or other legal entity.
(d) "Distribute" means to transfer possession of, whether with or without consideration.
(e) "Knowingly" means having knowledge that the matter is obscene.

MR. RICHART: Well, Mr. Chairman, I think that the actual figures on that would be more accurate if they came from the Controller's Office. But I'll do my best.

We had taken the *Mark Twain* puddle-jumping around Section A8-9Rr, c7. As you know, I'm sure, trade exploration—like pure scientific research—is sometimes a chancy business. It doesn't always pay off, but when it does, it pays off very well.

TWO HALF HITCHES



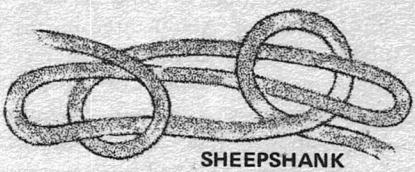
(b) "Matter" means any book, magazine, newspaper or other printed material or any picture, drawing, photograph, motion picture or other pictorial or written representation or material or any statue or other figure or any recording, transcription or mechanical, chemical or electrical reproduction or any other articles, equipment, machines or materials.

SENATOR FIELDS: Just what was it that you were trying to peddle that got us into all this hot water, my boy?

MR. RICHART: As I'm sure you can appreciate, Senator, we never know what we are going to run into. Sometimes it's nothing more than mirrors, beads and trinkets for the natives. Other times it's transportation, science, minerals, foodstuff, communications. Almost anything useful to us for something useful to them. We seldom get minerals any more—more often science, communications—raw knowledge. Really, it's an advanced form of barter.

SENATOR FIELDS: And now it appears you're trading in obscenities. Is that your testimony?

MR. RICHART: No, sir. What I mean is that they think so, but we don't.



SHEEPSHANK

When the Court declared that obscenity is not a form of expression protected by the First Amendment,

no distinction was made as to the medium of expression.

SENATOR FIELDS: Explain that, if you will, please.

MR. RICHART: They explained it to us, sir—using our own terms. The result was that they tried us in their courts, using our laws—our own Constitution—the rule of law we say we live under.

SENATOR GOBEL: I don't think I'm stupid, but I'm not following this at all.

MR. RICHART: It all had to do with what they were like—physically, I mean.

SENATOR BENNY: Well?

SENATOR ALLEN: This needs more explaining, I hate to play straight man to all this, but I'm still in the dark. Light a candle and lead the way.

MR. RICHART: I'll try, sir. You have seen the tapes and pictures we've brought back?

SENATOR ALLEN: Yes.

MR. RICHART: The dominant form of life in this whole section of the Galaxy has the physical shape of rope. By rope, I mean the heavy line that is used to hold a large ship to the pier. About three inches in diameter and about ten in circumference. The length of the average Twautbes is around seventy or seventy-five feet. As the *Mark Twain*'s doctor testified earlier, the sense organs and body structure are considerably different than ours. They not only look like a piece of rope, but act like it too. What I mean is that their eyes, mouths and ears are set into the grooves of their bodies. A line of rope has a "lay" or coil to it and that is where their organs are.

SENATOR MARX: All of them?

MR. RICHART: All of what, sir?

SENATOR MARX: All of their organs.

MR. RICHART: I guess so. I'm not a doctor, but it looked like it to me. They could hear, see, speak after a fashion, were sensitive to touch, tasted things, ate things, had sex—and weren't at all private about that. What other senses they may or may not have had, I don't know. You would have to ask an expert about that.

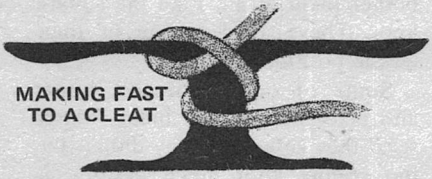
SENATOR SKELTON: This still doesn't get down to brass tacks. What was it that you were peddling that got this whole planet into trouble? What did you do to get the entire Earth declared obscene?

MR. RICHART: With all due respect, Senator, I cannot accept that it was really my fault—any more than it was the fault of the Captain or of the Trade Officer.

SENATOR GLEASON: Then whose fault was it? I'm looking for a hero or a villain. Let's quit beating around the bush.

MR. RICHART: I've been trying to explain that for some time now, sir. They live on a series of flat worlds, live outdoors, have no written language—but rather have pho-

tographic multi-generation race memories. They didn't need foodstuff or agriculture techniques. So we did what we often do under those conditions. We gave them twenty-four hours of random access to our Library of Congress.



. . . But this generalization, like so many others, is qualified by the book's content. As with pictures, films, paintings, drawings and engravings, both oral utterance and the printed word have First Amendment protection until they collide with the long-settled position of this Court that obscenity is not protected by the Constitution.

SENATOR WILSON: For what in return?

MR. RICHART: For a thorough background in their Interplanetary Communications System.

SENATOR COSBY: Sounds like a bad trade-off.

MR. RICHART: Senator, we didn't think so at the time. They are in every sense of the word intelligent: i.e., they put names to things, they are able to both anticipate and reflect on the consequences of their existence and their actions. They also appreciate the part and value time plays in the ebb and flow of life's patterns.

You see, they have colonized whole star systems, while having no spacecraft of their own. They traded their telepathic communication ability for transportation and then proceeded to talk all the newly-colonized planets into forming a confederation with themselves as Titular Head. All of this was done without wars, without violence—and they still controlled the communications.

Yes, Senator, understanding the technical foundations and the motives behind them looked like something very worth while to us, sir—at the time.

SENATOR RICKLES: But not worth getting this entire Earth declared obscene, along with my mother on Miami Beach, don't forget. You got my mother declared obscene, too.

SENATOR CARSON: Young man, if we could get back to the subject at hand. We were discussing the Library of Congress Micro-mini-computerization and what that has to do with our present sorry state of affairs. Please continue.

MR. RICHART: They were curious about the fact that our home planet has so much water. As you know, most worlds have far less. One thing that fascinated them was that we used to have old-fashioned sailing ships plying the seven seas and engaged in trade. Not unlike our present-day activities of inter-

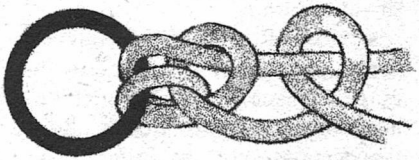
planetary trade. "Nature of the species," they called it, and they seem to be right. Shipping led to sailing and sailing led to Marlinspike Seamanship.

SENATOR BERLE: Come around again. I don't believe I have that one in my files.

MR. RICHART: Marlinspike Seamanship—rope and rope tying, sir. They think it's obscene and to their satisfaction they proved it.

SENATOR BUNKER: Dis here discussion is gettin' out of hand. You mean to tell me dat rope tyin' is sexy.

FISHERMAN'S BEND



Obscene material in book form is not entitled to First Amendment protection . . . A state may control commerce in such a book, even distribution to consenting adults, to avoid the deleterious consequences it can reasonably conclude (conclusive proof is not required) results from the continuing circulation of obscene literature.

MR. RICHART: No, sir, but they are shaped like ropes and they have their own sexual habits—not unlike the tying of several of our knots. They seem very straight-laced—if prolific—about the whole thing.

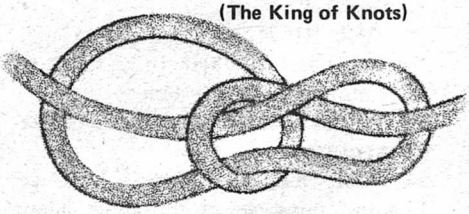
They're a bisexual species just like we are and it takes two to tie the knot—so to speak.

To look at the positive side first, one thing that was well within their frame of reference was the tying of *two* ropes together. That didn't bother them at all. Like the square knot. They called it one of their classic positions.

Some of our decorative knots and macrame amused them. "Party sex," they called it. They didn't like the granny knot much because it tends to get all jammed up, and to use their own words, "had the danger of excessive permanence." They knew about it, but didn't like it because they breed like rabbits and number in the tens of billions in several planets.

SENATOR PARR: Would you please tell this Committee, Mr. Richart, what the bottom line is. Briefly, please!

BOWLINE
(The King of Knots)



On appeal . . . it concluded that evidence of a "national" standard of obscenity was not required. It also decided that the State does not always have to present "expert" evidence that the book lacked "redeeming social value," and that, "in light

. . . of circumstances surrounding the sale" and the nature of the book itself, there was sufficient evidence to sustain the petitioner's conviction. Finally, the State considered petitioner's argument that the book was not "obscene" as a matter of constitutional law. Pointing out that the petitioner was arguing, in part, that all books were constitutionally protected in an absolute sense, it rejected this thesis. On independent review, "it . . . appeals to the prurient interest in sex and is beyond the customary limits of candor within the State of California." It held that the book was not protected by the First Amendment. We Agree.

MR. RICHART: In a phrase—two ropes of Twautbes is sex in the normal sense of the word. One is self-abuse or masturbation and it's not only illegal, but also obscene and they have declared both our species and culture to be guilty of it. We are out of bounds to each other, and if we don't "shape up we can ship out" and find ourselves restricted to our own Solar System. They can put us in cultural quarantine. The result is that we can have our trade markets shut off and we will be treated like mini-art book peddlers—like obscene lepers.

SENATOR CARSON: By what standards?

MR. RICHART: By our own, sir! Any publication, such as "Sailor's Knots" by Cyrus Day, the "Navy Blue Jacket Manual" and "Chapman's Piloting. Seamanship and Small Boat Handling," all have knot illustrations and directions in them and are therefore obscene because they are for sale and we are engaged in commerce with them as part of our library.

The long and the short of it is that we are peddling what they have judged to be obscenities and they have used our court system to do it.

SENATOR CAVETT: Our own courts? How and why?

MR. RICHART: Yes, sir. They applied the Local Community Standards clause to mean their own little corner of the Universe.

The "why" part is harder. I don't know except to say that the idea of one rope or Twautbes tying itself into knots and having sex by itself is "beyond the customary limits of candor."

SENATOR RICKLES: Let me see if I have this straight: "Any use or discussion of or illustration of a single rope to tie a knot is obscene because it is interpreted by this species as a form of self-abuse due to their shapes and sexual habits."

MR. RICHART: Yes, sir. And, I'd like to point out that this discussion meets those standards as well. We have been discussing the trading of information, and more than that, we have discussed knot-tying and illustrated them. These proceedings—by our own legal standards—are obscene. Senators, witnesses, testimony and illustrations.

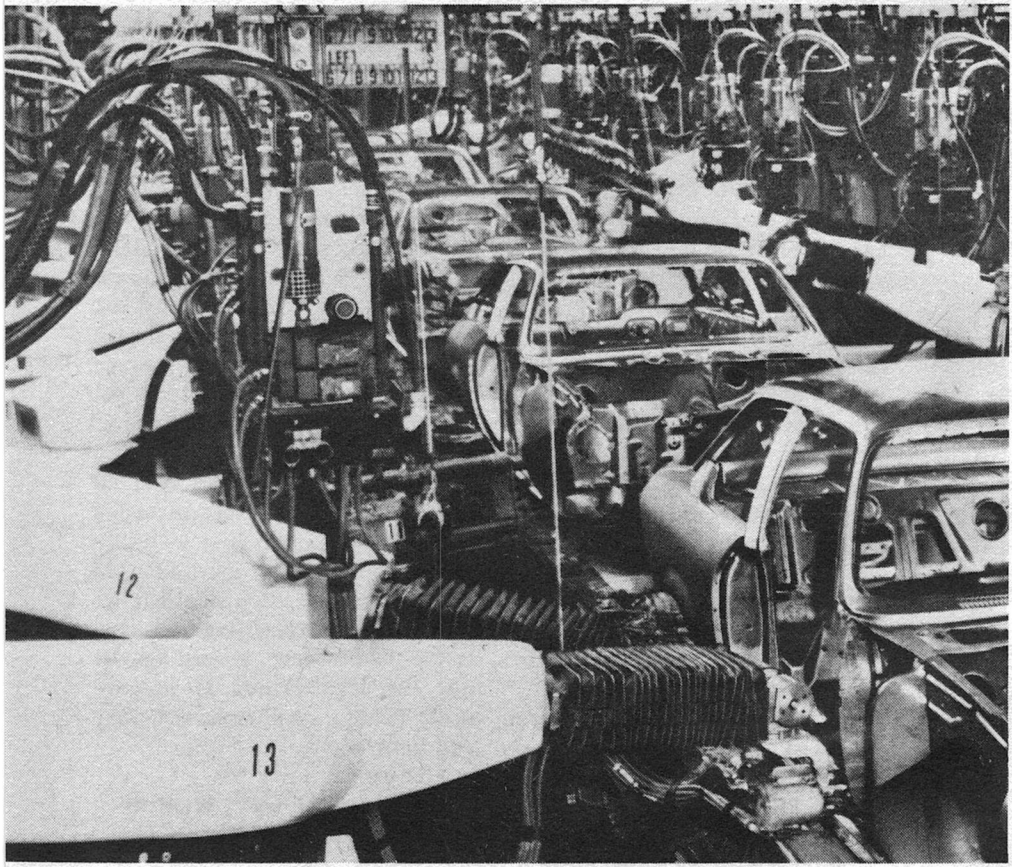
All obscene.

SENATOR BENNY: Well! ■

THE ECONOMICS OF THE ROBOT REVOLUTION

Advances in technology create a need for advances in social, political, and economic thinking. Past history has shown that new ideas along these lines are always denounced as revolutionary and utopian—and are always too conservative!

JAMES S. ALBUS

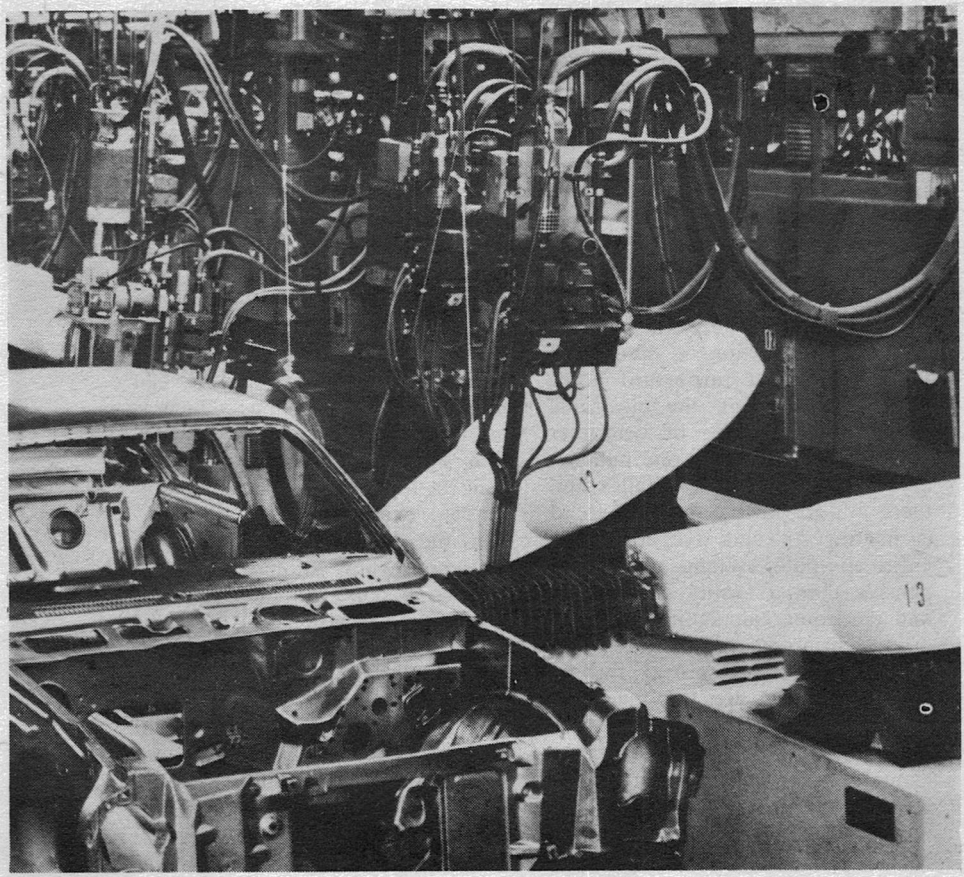


Unimate robots spot-welding on the Vega assembly line.

The human race now stands on the brink of a new industrial revolution—a robot revolution—which will at least equal, if not far exceed, the first industrial revolution in its impact on mankind.

Most of the technology already exists for building robots capable of performing much of the productive work in today's economy. What additional technology is needed could be developed by the expenditure of a relatively modest amount of research monies.

The principal barriers to a robot-based economy are no longer technical; they are economic, social, and political. Robot industries will create enormous amounts of wealth which is translatable into economic and political power. Until some equitable and socially acceptable method can be found for distributing this wealth and controlling the power which it represents, the full potential of robot



HELEN GARTHWAIT, UNIMATION, INC.

technology cannot be released to serve the needs of mankind.

Primitive industrial robots are already in use in many factory environments relieving people from work which is hazardous or boring. Presently these machines are limited in their skills and are still too expensive for widespread use. However, the addition of a few simple touch and visual sensors in conjunction with advanced methods of computer control will soon make industrial robots adept at loading and unloading machine tools, assembling parts into final products and packaging and handling goods for market. Furthermore, a number of economic events are working together which within a few years will reduce the cost of this technology to the point where robots will be economical for home and garden use as well as factory and warehouse applications.

First of all, there have been spectacular reductions in the cost of the single most important component of a robot, the electronic computer. The price of computer power has dropped by one half every year for over two decades and there is no evidence that this trend is nearing an end. Already some entire computer systems are less expensive than a family automobile, and electronic calculators cost little more than a tank of gasoline.

Of more fundamental importance, however, are the manufacturing processes which have led to these remarkable cost reductions. Computer-aided-design and computer-aided-manufacturing techniques are two of the principal reasons the computer industry has been able to cut costs so effectively. Most of the electronic circuits used in computers are designed and built with computer assistance. It is not at all uncommon to see a computer being used to control the very machinery by which the computer itself was manufactured.

The manufacture of computers by other computers is a regenerative, almost reproductive, process which causes costs to spiral downward while complexity and reliability are increased. The complete process is somewhat reminiscent of a living organism. The genetic code is represented by information stored on tape or disk files defining operational procedures for the manufacture of yet unborn machines.

The fact that machines have very nearly reached the capacity for self-reproduction has economic implications which are profound and unprecedented. If one machine can produce another machine which is just like itself but less expensive, then the second generation machine can produce a third generation, less expensive still.

In the future this principle of self-reproduction should apply to the manufacture of industrial robots just as it now does for computers. If robots can operate machine tools, then they can build other robots. Thus, the cost of robots and computers alike should fall exponentially. Eventually, entire robot factories should cost little more than the price of the raw ma-

terials from which they are constructed. This, of course, implies that anything manufactured in such factories would be very inexpensive indeed. Completely automatic factories and entirely computer-controlled industries should be capable of creating material wealth in such fantastic abundance at such low prices that the mind simply boggles at the possibilities.

A conscious decision to proceed with the creation of largely automatic industries controlled by computers and operated by industrial robots has not been made. Indeed, it cannot be made until two fundamental economic and political questions are satisfactorily answered.

First, if robots do most of the economically productive work, how will people receive income? Secondly, if robots are to create most of the material wealth in our society, who will own them and control the powerful economic and political force they will represent?

Ours is presumably a capitalist society, i.e., a society based on the economic concept that private ownership of wealth-producing capital is a legitimate source of personal income. From the very beginning this was a nation of property owners. Washington, Jefferson, Franklin, Madison, Adams, Hamilton, indeed the entire list of men who signed the Declaration of Independence and framed the Constitution were owners of wealth-producing property. The central premise of Jeffersonian democracy was that ownership of land, and thereby ownership of the means of production, should be widely distributed among the electorate in order for democratic government to function effectively. In the early American colonies this was largely the case.

Unfortunately, however, over the past two centuries the ownership of wealth-producing property has gradually become concentrated in the hands of a very few. Small farmers no longer make up any significant fraction of the population. Less than five percent of the population owns a controlling interest of all corporate assets in the United States. Ninety-five percent of the population receives over seventy-eight percent of their income either from wages and salaries or from welfare.

The overwhelming majority of Americans, even in the middle and upper income brackets, are simply employees, dependent from pay period to pay period on wage or salary checks for their income. Thus, America in actual fact is not a capitalist society at all, it is an employee society.

There is no wonder the work ethic is pervasive and that unemployment is a dark specter. There is no wonder that industrial robots, automatic factories, and computerized offices are a threat to our social and economic well being. We are a nation of employees. We derive our income from what we *do,* not from what we *own.* We are not capitalists, we are wage earners and in a very real sense "wage slaves."

This situation not only impedes the development of more efficient industrial methods, including robot

factories, which could easily eliminate both poverty and pollution, but it also causes many pressing social problems. The need for society to share its wealth equitably has generated enormous pressures to create and maintain jobs because that is virtually the only legitimate source of income. As a result our economy is full of make-work projects, featherbedding, planned obsolescence, mass advertising of useless trivial products, and wasteful use of natural resources and human talent. All of this is done in the name of creating or preserving jobs. Yet even these measures have not prevented serious unemployment from persisting in many segments of the economy.

There are a number of reasons why it is difficult to eliminate unemployment in the existing economic system. To begin with, there are (and will always be) many individuals who are simply not qualified, either physically, mentally, or temperamentally for the type of wage competition which is imposed by a technological-industrial economy. If legitimate alternative sources of livelihood are not provided, these people will inevitably be forced into dependence on charity and public welfare.

Furthermore, the requirement that wealth be distributed almost exclusively through wages and salaries results in most income being concentrated in the capital-intensive sector of the economy. This forces unskilled persons out of non-capital-intensive jobs such as family farming, personal service jobs, and the handcrafts. Yet every major city has ghettos already filled with people from similar backgrounds who cannot find employment in high technology industries. Domestic help, the neighborhood grocery store, and the door-to-door vegetable wagon have become almost extinct, not because there is no one looking for a job, and certainly not because people do not enjoy such work. The problem is simply that such employment does not provide an income competitive with capital intensive jobs. Thus, many pleasant niceties disappear from our lives and the unemployment statistics continue to increase. The Gross National Product, of course, advances every year, but one sometimes wonders whether we are really getting richer in any fundamental sense.

The irony of this situation is that it could rather easily be remedied if we took our own capitalistic rhetoric seriously. If we were in fact a nation of capitalists deriving the majority of our personal income from the ownership of capital rather than from wages and salaries, then the benefits of productivity increases could be distributed primarily through dividends rather than through wages. If the distribution of capital ownership were widespread, as suggested by the Jeffersonian concept, then the distribution of dividends would be equitable also. Everyone would benefit from productivity increases, and not just workers in selected industries. Unfortunately, such is not the case.

Instead, we remain committed to wages and salaries as our primary

mechanism for income distribution. We cling dogmatically to the work ethic and the labor theory of value despite the transparent fact that the overwhelming percentage of productivity increases are not attributable to labor at all. People do not work any harder now than they did three hundred years ago, and they are not inherently any more intelligent. Increased productivity has almost always been due to modernized equipment, increased knowledge, and improved process technology. Yet we distribute the benefits of productivity increases through wages and salaries as though human labor were the primary source of wealth. The truth is that labor has become a relatively small and rapidly diminishing factor in the production of goods and services.

Failure to recognize this reality by distributing income through some mechanism other than wages and salaries has forced the cost of labor so artificially high that many jobs have had to be discontinued simply because they are not worth the salary they command. Thus, in spite of the enormous amount of make-work, planned obsolescence, waste, and artificially stimulated mass consumption, it has become impossible to create enough jobs to prevent a large and growing percentage of the population from being left out of the principal income distribution channels altogether.

The Puritan work ethic once served America well. Dedication to the principle that every person should pull his own weight through hard work made it possible for a modern industrial nation to rise from a primitive wilderness in less than three centuries. Likewise, the labor theory of value brought enormous benefits to the average worker. It provided a logical rationale for organized labor's demands that the wealth created by modern industry be distributed to the workers. Unfortunately, cherished ideas cultivated over centuries live on long after they cease to be true or even useful. Human labor has long since ceased to be the most important ingredient in the industrial process; indeed, in many industries human workers are the principal cause of production defects. Today the first industrial revolution is complete. The labor theory of value and the work ethic are no longer useful concepts, and in fact, they may now constitute the most important impediment to the implementation of technological advances which could eliminate both poverty and pollution not only in the United States but throughout the entire world.

We are on the threshold of an age of robots and automatic factories. If we could admit to ourselves the reality that machines can run industries just as well, if not better than people, then we could devise an income distribution system based on something other than employment. We would then have an economy where machines do most of the work, and people reap the dividends.

Before pursuing this line of thought any further, it must be emphasized that there will always be

some work requiring human effort even in the most automated society. Furthermore, there will probably always be a large number of individuals who enjoy regular employment. Certainly there will always be those who desire opportunities for success and achievement offered by the competition of career employment. Thus, the distribution of some income through wages and salaries will be necessary and desirable even when most of the goods and services are produced by automatic factories and robots.

Nevertheless, it is quite possible to have a hybrid economic system where a basic minimum income would accrue to everyone out of the profits from automatic industries. At the same time, anyone who wished to work could supplement their basic income with a salary. There is no reason that wages and salaries should not coexist nicely with public dividends from automatic industries in an income distribution system of the future.

How could such a system be practical? What new institutions would be necessary to implement the distribution of income through public dividends? The mechanisms outlined in the following paragraphs are one possible approach to how such a system could be organized within the framework of our present constitutional government and free enterprise economy.

The National Mutual Fund

A semi-private investment corporation, the National Mutual Fund (NMF) could be formed. Like any mutual fund the NMF would earn a profit by investing money in stocks. The NMF, however, would differ from an ordinary mutual fund in four important respects.

First of all, it would be all-inclusive in scope. Every citizen would be a shareholder by virtue of his or her citizenship.

Second, the NMF would not obtain its investment funds directly from its shareholders, but instead it would borrow the necessary investment capital from the Federal Reserve Bank. Each year the NMF would be authorized by an act of Congress to borrow a specified amount for its investment operations.

Third, the NMF would concentrate its investments in high technology, automated industries and in the modernization of technologically backward industries. Specifically, the NMF would attempt to promote the development of robots and automatic factories and would provide supplemental worker's compensation and retraining incentives where these would be necessary or useful in accomplishing its goals.

Fourth, the NMF would distribute the profits from its investments directly to the public on a biweekly basis. Every adult citizen over the age of 18 years would receive NMF dividend payments in an equal amount.

The uniform distribution of dividends is an important feature of the NMF. It is crucial to emphasize that NMF public payments would *not* be welfare or charity based on need. They would be dividends paid to the shareholders of a

profit-making institution. As in any corporation, each share of stock should receive an equal share of the dividends declared. Furthermore, equal payments irrespective of all other sources of income would avoid the creation of disincentives to personal achievement which is inevitable with any system of graduated distribution. No one would lose NMF benefits as a result of getting a better-paying job. Finally, equal payments to everyone, rich and poor alike, would tend to unite the entire country behind efforts to make the NMF successful as a profit-making institution.

The NMF would, of course, wield enormous economic and political power as it implemented its investment policies. It therefore should be a politically responsive organization. As in any corporation, the NMF would be subject to legislative control by the Congress and to the judicial powers of the courts. But the ultimate control of any organization with so much power should be with the people directly. Thus, the NMF would be administered by a publicly-elected board of governors. There would be nine NMF governors elected to staggered six-year terms. In most respects the NMF would be similar to any private corporation controlled by a board of directors elected by the stockholders. The principal difference would be that every citizen would in effect own one share of voting stock in the NMF, whereas private corporations typically have fewer stockholders and uneven distribution of shares.

The National Mutual Fund would in no way be a form of government control over private industry, nor would NMF ownership be tantamount to nationalization of industry. In the first place, the NMF would be a semi-private, profit-oriented investment corporation, not a government institution. Furthermore, the NMF would participate in control of an industry only through the purchase of corporate stock voluntarily offered for sale by the industry itself.

NMF ownership would not diminish the impetus of the profit motive in the least. Quite to the contrary, the NMF governors would be under considerable pressure to invest only in highly profitable industries in order to maximize the amount of dividends paid to the public. NMF-owned industries would thus be just as sensitive to the need for efficiency and long-term profitability as privately owned industries and perhaps even more so.

Public participation in the election of NMF governors would not only create incentives for industrial efficiency, but would also provide a forum for public debate on corporate policy. The average citizen would have a direct voice in the fundamental decision of businesses and industries under NMF control. In this sense, then, the NMF would convey to every individual citizen the rights and prerogatives of ownership. The NMF would in this way be a means of achieving the democratization of industry in much the same way in which representative government has been a

means of achieving the democratization of government. The NMF would in effect create a Jeffersonian democracy in a modern post-industrial state.

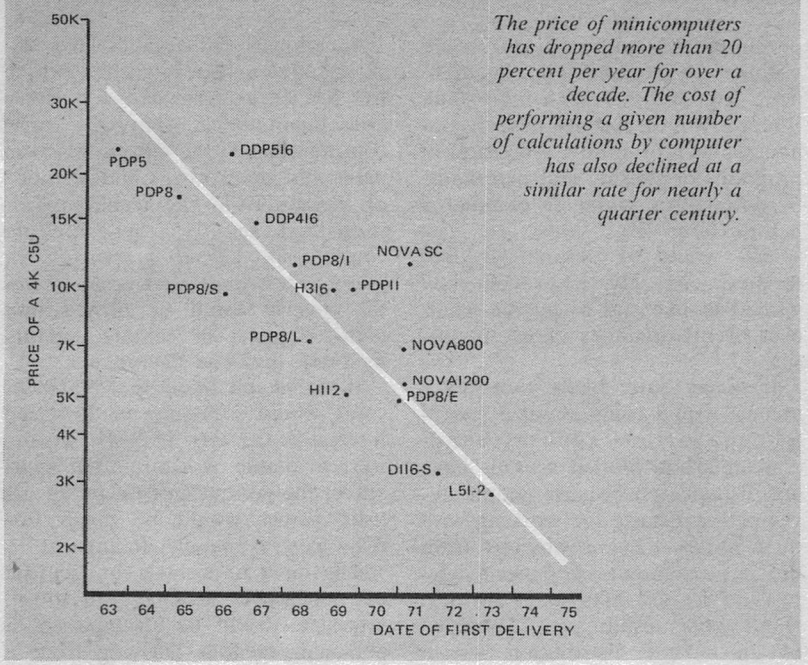
It is suggested that the National Mutual Fund be begun on a pilot study scale with a borrowing authority for the first year of operation limited to ten million dollars. If all went well, this authority would be expanded by a factor of roughly three every year for about thirteen years, or until the NMF investment rate approximately equalled the total private investment rate from all other sources. If such a program were begun in 1975, it is estimated that by the turn of the century, the public dividend payments to each citizen would be between six and twelve thousand dollars per year per person in 1970 dollars.

To some this may not seem like a lot of money. However, for a family of two adults it represents an income of twelve to twenty-four thousand dollars completely independent of whatever else they may earn from job employment and/or private investments. Furthermore, this is only what could be achieved within twenty-five years. An additional quarter century of NMF operation might easily quadruple this amount.

The effect of eventually doubling the nation's investment rate through a borrowing institution like the NMF would tend to be inflationary in the short term. Over the long run, investments in modernization and in new high technology processes and machines such as computers and robots are always deflationary, because such investments increase productivity, improve the quality and reliability of goods and services, and reduce costs. However, until new plants go into production, and until new machines begin to operate at full capacity, money spent on investments finds its way into the pockets of consumers and creates inflationary demand.

Thus, in conjunction with (but institutionally separate from) the National Mutual Fund, it is suggested that Demand Regulation Policy (DRP) be implemented in order to maintain price stability. The DRP would prevent inflation by the mandatory conversion of a portion of individual personal income into DRP savings bonds. DRP savings would be withheld by the same methods presently used in withholding income taxes and social security taxes. DRP savings bonds would earn interest and would be redeemable within five years. The amount of DRP withholdings would fluctuate monthly and would depend on the best available economic indicators for predicting inflation. In periods of high inflationary pressures, DRP withholdings would be increased to curb consumer demand. In less inflationary times, DRP withholdings would be reduced or eliminated, and under sluggish economic conditions, DRP savings bonds would be redeemed prematurely in order to stimulate consumer demand.

This Demand Regulation Policy would prevent excessive demand



The price of minicomputers has dropped more than 20 percent per year for over a decade. The cost of performing a given number of calculations by computer has also declined at a similar rate for nearly a quarter century.

during periods of high NMF investment spending. Savings would be withheld in approximately the amount of NMF investments. Of course once NMF investments began to pay off, the redemption of DRP savings bonds would release pent-up demand so as to absorb the increased productive output from industries modernized by NMF investments.

The National Mutual Fund and the Demand Regulation Policy would revitalize market competition in the corporate free enterprise system. The increased availability of investment capital, especially for the development of new technology, would make small entrepreneurial corporations flourish. The advantage of simply being big would largely disappear because substantial financial resources would be readily available to any business with practical ideas for profitable ventures. The NMF thus would stimulate market competition, and thereby decrease the need for government subsidies and controls. In the process it would increase the quantity and quality of goods and services available at reasonable prices.

The effect of the National Mutual Fund on individuals would be even more dramatic and far-reaching than that on industry. Once NMF public dividends rose above a few thousand dollars per year per

person, every adult citizen would become an economically independent and self-sufficient individual. Welfare would become entirely unnecessary and many government programs of subsidy and paternalistic do-goodism could be eliminated altogether. Everyone in the society would be economically free to live virtually wherever they wished to live and to pursue whatever occupation they chose to pursue.

It seems quite likely that NMF income would bring about a revival of occupations such as handcraftsmanship. Skilled artisans have not disappeared because people developed a distaste for working with their hands. This is obvious from the large number of persons who pursue handcrafts as a hobby. Handcraftsmanship was destroyed by an income distribution system which subsidized capital-intensive labor by profits from machine-created goods but did not do the same for hand labor. The NMF would distribute machine-created wealth to everyone, handcraftsmen as well as machine operators. Thus, persons inclined toward the hand trades would once again be free to pursue their interests because of a secure income from NMF payments.

Family farming is another occupation which would probably exhibit a strong resurgence. The small farmer was driven almost to extinction by the industrialization of farming. NMF supplemental income would make it economical once more for a single family to own and operate a small farm.

Sociologists for decades have deplored the urban migration which has led to overcrowded city slums and depopulated depressed rural communities. If the citizens of rural areas and small towns had a source of income from the technological-industrial sectors, these people could easily be self-supporting. In many cases, depressed areas of rural poverty could be turned into idyllic regions of remote serenity by NMF dividend payments.

It also seems likely that NMF income would stimulate an increased interest in the arts. If NMF income were available as a minimum guarantee, the serious pursuit of an artistic career would be much less risky from a financial standpoint.

The most important contribution of the NMF to the individual, however, would be an increase in personal freedom deriving from a substantial and secure source of independent income. In a society where the enormous wealth-creating potential of robot industries was fully realized the NMF would guarantee to every citizen an equitable and inalienable share of the economic power. Political freedom for the individual would thus be virtually assured. NMF income would give everyone the security to express his or her political views fully without fear of economic reprisal.

Culturally individualistic communities would undoubtedly develop as persons become financially able to select their living quarters on the basis of personal taste rather than because of economic need to be near centers of employment. Today

it is difficult for culturally or religiously dissident groups to assert their independence from the homogeneity imposed by the wage competition of the technological industrial world. Only a few tightly organized subcultures such as the Pennsylvania Amish have been successful. NMF income from robot industries would make it possible for any group of individuals, no matter how unconventional their ideas, to establish themselves as an economically viable community.

The NMF would make it possible for even primitive tribal cultures to exist within a technologically advanced country. Income from the industrialized sector would be paid by the NMF to Indians on reservations and to other persons interested in living in non-industrialized cultures. This would make it possible for wilderness areas to be maintained intact so that primitive life styles could be preserved uncontaminated by contact with cities and factories.

A substantial independent income would give to the individual the financial power to resist unwanted economic and political pressures. Even small groups would have sufficient economic leverage to defy coercion either from big government or powerful private interests. Citizens of rural communities who wished to preserve the peaceful character of their neighborhoods would be able to resist enticements of real estate developers and the encroachment of factories and refineries. Workers would have the financial reserves to enable them to leave their jobs and search for more satisfying employment. Individuals would no longer be forced to join mass movements such as labor unions in order to protect their rights. A secure source of independent income would make individuals able to protect themselves without sacrificing their own individuality. This is a concept of personal freedom which goes far beyond any previous ideal.

In all the thousands of centuries prior to the first industrial revolution the human race existed near the brink of survival and every major civilization was based on some form of slavery or serfdom. A mere two centuries after the introduction of steam power into the industrial process the grandsons and granddaughters of slaves live in a manner which often surpasses the wildest utopian fantasies of former generations.

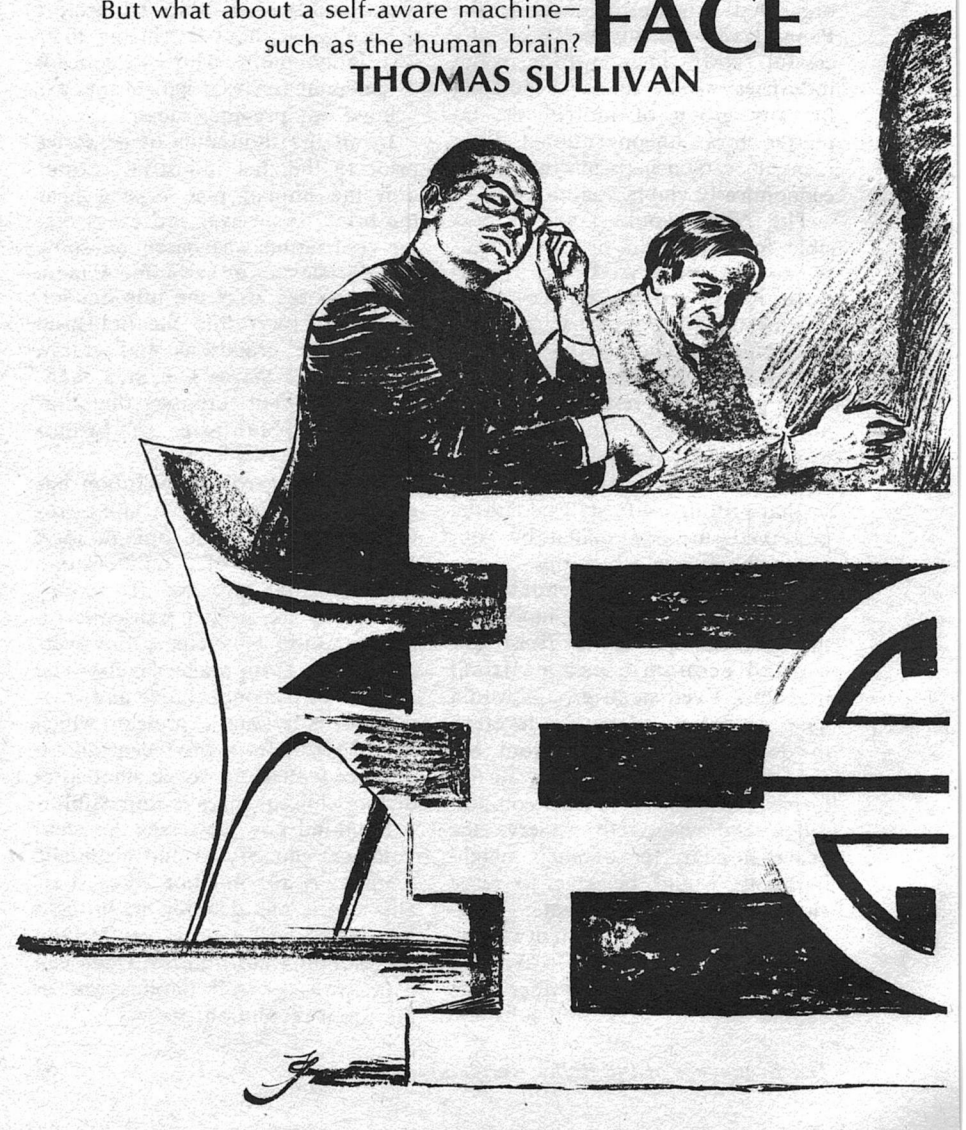
The coming robot revolution has the potential for an even more profound impact on the human race. The introduction of computers into the industrial process, if accomplished by the proper economic reforms, would emancipate the average citizen from wage-slavery. The latitude of personal choice and freedom for individual expression which would result from this event are so unprecedented in scope that predicting consequences is impossible.

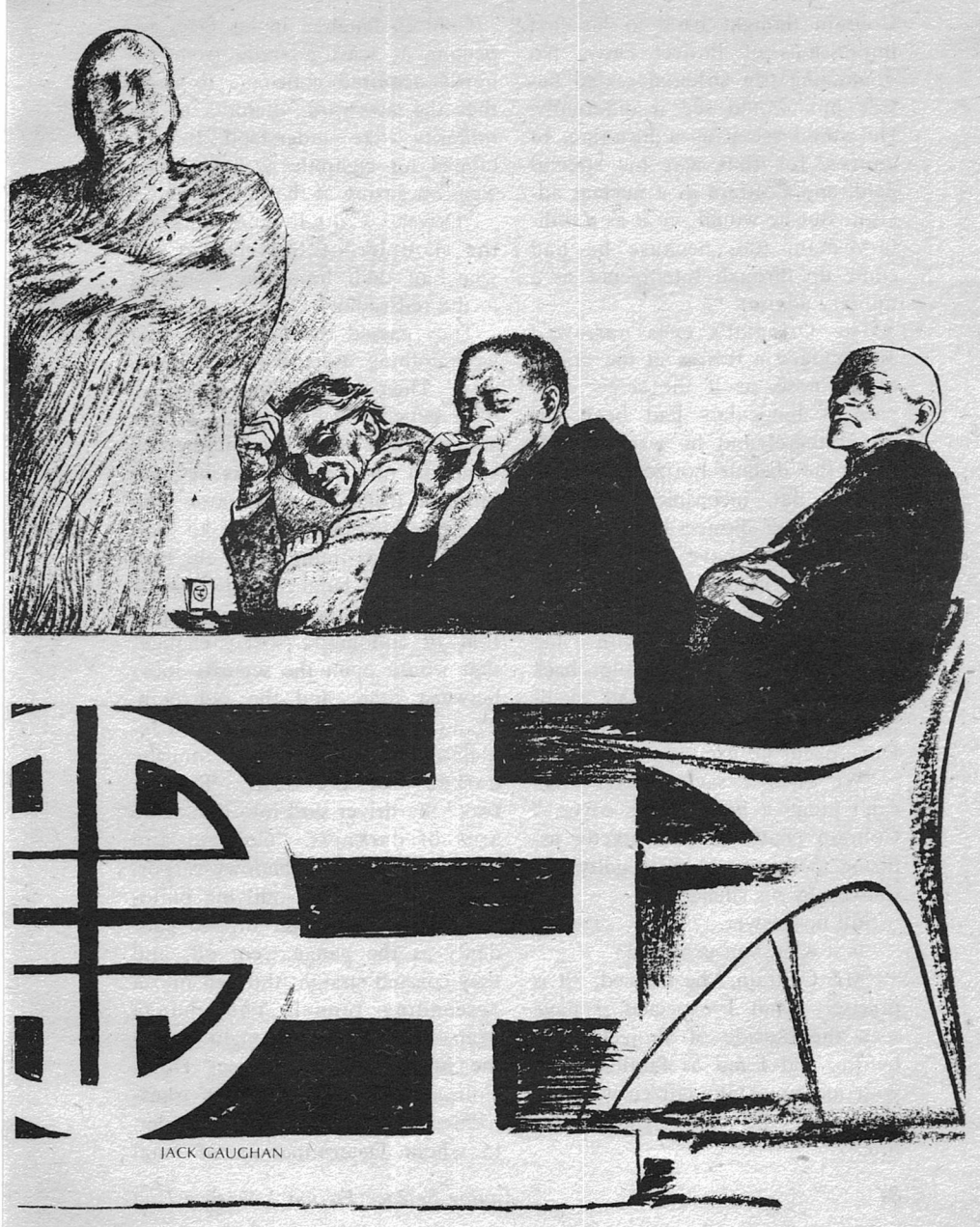
Mankind now possesses the technological capacity to end economic scarcity. A robot labor force literally awaits our decision to bring it into being. All that is yet lacking are economic institutions which can cope with the full implications of the robot revolution. ■

THE SIXTH FACE

Machines can be programmed.
But what about a self-aware machine—
such as the human brain?

THOMAS SULLIVAN





JACK GAUGHAN

Coltrain thought back to his first impressions of Project Dove. No doubt, the trig Oriental seated beside him would see it differently. He would see it as a historian, of course, for that was his special field, and Coltrain as a nuclear advisor. But he would see it as a military man, too, because he had come up through Intelligence as a military advisor.

The Oriental's eyes narrowed and nudged a furrow at the bridge of his nose, as if the screw of a pair of binoculars had been adjusted there, and he was focusing upon the distant horizon where a row of flat, inconspicuous buildings squatted—Project Dove.

"Not much above ground," Coltrain commented.

His companion prodded the tip of his cigarette into life with a tap of a finger and drew his lips back tightly over a row of small, shell-like teeth as if to say, "Project Dove needs no excusing."

"We have a saying here: 'You can't judge a book by its cover,' " Coltrain chattered on, secretly aspiring to the mandarin dignity Liu showed by his silence.

Still no answer.

"Is it what you expected?"

"Mr. Coltrain," he minced, "it is precisely what I expected. I have seen the outside of Project Dove before, and I am as familiar with your idioms as any citizen who has lived here the better part of his life."

Coltrain laughed in his face, expecting at least a smile from his newly acquired colleague to show that the awkward attempts at familiarity were understood. But he tapped his cigarette as before and went on gazing at the horizon.

"Driver," Coltrain said, touching the shoulder of the man at the wheel of their limousine, "straight to the red-room."

They passed the first guard post with nothing more than a friendly wave. Then the chauffeur flipped a dash switch which activated a little gauge at his side. The number 30 appeared on the gauge as he took his foot from the accelerator, and the speedometer adjusted to that speed. Almost immediately the tires hit the metal balance strips on the road, and they began the combination of automatic speed changes that would open the security locks between them and the red-room. "Your name, please?" a smooth female monotone whispered from the darkness of the dash. "Ranson two," the driver said into that same area of darkness, "Coltrain and Liu." Up ahead, a shadowy carport loomed on the first outlying building. The speedometer dipped suddenly as the gauge went off, and they coasted straight through into a descending tunnel. The change from day into night brought with it the atmosphere of Project Dove. Coltrain found his thoughts transformed from those of an outsider, to whom Determination Of Vital

Engagements was as stuffy as it sounded, to those of the inner circle, who found in Project Dove the awesome responsibility of projecting the future. Though their work was twenty years ahead, recent world events were conforming to the grim pattern indicated by the early stages of the mock war being fought behind the walls of Project Dove.

"Good morning, sir," a young officer bade him as he opened the car door, and again to Mr. Liu, "Good morning, sir."

They followed him through the heavy doors to the security room where their fingerprints were instantly recorded and checked on a Photostat device, then down the corridor to a full-length set of panels between which they were required to stand individually. It was explained to Liu that it was merely a security precaution, a screening like an X-ray designed to obliterate any film, exposed or not, which might be carried to or from the red-room. They proceeded on. A briefing was due this particular morning; Liu must meet them all, and they must meet Liu.

Dr. Udall, chief coordinator of Project Dove, did the honors, introducing them one by one outside the red-room. "Retired General Thorpe," he began, and stiff-backed, harmless-looking old Thorpe tensed his neck at Liu and passed into the red-room. ". . . Dr. Arthur, expert on Asian affairs." The bearer of that title stepped forward to greet the new member. ". . . General Lim, formerly of the Nationalist Chinese Army," Udall said with special politeness, adding with equal ceremony, "Mr. Tikhonov defected from the Soviets during the Stalin era. Our air power strategist is Colonel Breck, Mr. Liu, and of course you know Mr. Coltrain."

The steel doors closed behind them, and they stood in the ominous quiet of the red-room. Its dead acoustics forever amazed Coltrain. A spoken word or a dropped pencil seemed to land with a thud on the ear. Likewise, the volume of a voice varied with the slightest turn of a head, because sound was immediately swallowed by the walls, ceiling and carpet. No words ever outlived their utterance in that room; and certainly none were repeated outside its walls.

"Sit down, sit down, gentlemen," Udall wheezed, "in front of the map will do." They sat in the rich, upholstered chairs indicated. "I'll begin by explaining the map, Mr. Liu. You see here the red and white markings of the Asian and Allied forces respectively. You, of course, are a part of the Asian forces. At the opposite end of Project Dove is a similar building containing a white-room for the Allied forces. What you're permitted to know of them, their weaponry and potential, is recorded on microfilm in this room . . . you see

the screen over there. As you've probably noticed, the date on the electric calendar is June 10, 1990. At any given time we may adjust that date either forward or backward, depending on re-evaluations of Allied or Asian potential based on information from our agents. You may, from time to time, be called upon to solve a different, more current problem. But you'll always be engaged in this day-by-day war indicated here. Your strategy and movements will be submitted to a coordinator at the end of each session. On the following morning you'll receive a report on the number of casualties, et cetera . . . You realize, of course, that you're not the only 'think tank' established by the government outside of private enterprise to work on this project. There's a little . . . *esprit de corps*, shall we way? You understand. And you have access to more classified information than any other single group of strategists in the country. Mr. Liu, you have virtually all the military information available to this country in your hands; that, together with the expertise on Asian affairs here in this room, will mold the defenses of the free world."

Coltrain felt as though the national anthem were playing. He couldn't say what Liu felt; he looked like a security risk, sitting there sucking his cigarette with passionate kisses, as if it were opium. Liu had no questions, and Udall bade them good-day. They had hardly begun to speak when they heard the familiar sound, like the drawing aside of a curtain, of the pneumatic tube. Dr. Arthur went over to it and withdrew a long metal cylinder. From this he took a sheaf of papers.

"We've lost Canton," he said after a moment of study. "The whites have deployed ground forces and moved in conventional weapons."

"What about the outpost?" General Thorpe demanded impatiently. "That's what we wanted, isn't it?"

"They moved it," said Arthur.

"Moved it? Where? What do you mean 'moved it'?"

"It's gone. The territory is unoccupied."

"They're going to contaminate it!" snapped Thorpe.

"Like scorched earth," Liu contributed softly.

"They want us to move in so they can contaminate it!" Thorpe insisted.

"Perhaps it was done to consolidate Canton," suggested Lim with an air of humility. "A sacrifice—"

"No, no, they want to sacrifice us, don't you see?" Thorpe cut him off. "They wouldn't open up that much territory. They're clearing it for a slaughter."

"This . . . this cemetery you say they are clearing," Lim began again, "how do they intend to cross it once it is contaminated?"

"That's hardly important!" Thorpe pressed. "Once we're in,

they don't even have to contaminate it. If they have, in fact, a nuclear skimmer, we'll be roasted with one pass. What do you say, Coltrain? Still think they have it?"

"Yes," he answered bluntly, though he didn't want to argue with him.

"Perhaps," Lim said.

At this point, Tikhonov asked to see the evaluation; he took the sheaf from Arthur and placed it on a viewer which threw a detailed map on the screen. The point at issue was a minor one, relative to the concept involved, but it would serve as a test case for larger operations. Colonel Breck at once took sides with Thorpe, and it seemed that Arthur, Tikhonov and Lim were slowly won over. So the morning went, a typical one, if one could speak so blandly of Project Dove.

At noon Coltrain made another overture to Liu. "For security reasons, we are encouraged to make our business colleagues our social friends," he said clumsily. Liu smiled, but there was nothing social in it. Besides, he had already made friends with Tikhonov, it seemed. Coltrain saw the two of them, Tikhonov's steely head and Liu's own short-cropped skull, bowed forward in staccato conversation, as if they were speaking in the chopped syllables of Liu's former tongue. After lunch, Liu approached Coltrain and confessed in businesslike manner that he had been rude and wished, indeed, to make his closer acquaintance. He invited him to his home. He was all business—the invitation was for the evening.

Coltrain found the house as introspective as Liu. Set back from the road behind towering trees, extensive arbors surrounded it on the other three sides. From all appearances, Liu was the settled and studious scholar of Oriental history his security record indicated. Inside, however, Coltrain met the first traces of a man not indicated on that report. If it had been incense alone he smelled in the plush foyer, it would have seemed quite natural, but there was the unmistakable odor of a laboratory. Liu immediately explained he was himself an amateur scientist and invited him, as a fellow scientist, to visit his work-room—this before Coltrain had handed him his hat or accepted a drink. He was all business, this Liu.

They passed through several rooms to a paneled, locked door. He had animals, Liu explained as he unfastened the lock, and enough LSD to give an army hallucinations. "Lysergic acid diethylamide," he augmented with enthusiasm, "and mescaline, if controlled, have the potential to rehabilitate any personality." Coltrain understood him to mean by this that he hoped to control the temporary hallucinations brought about by either drug, but he made no immediate explanation. "I am interested in illu-

sions in general," he explained vaguely, "what causes them, how long they last, and if they can be controlled."

"A laudable enterprise," Coltrain told him, wrinkling his brow at the strange assortment of surgical and chemical apparatus in the workroom.

Along the opposite wall were the caged animals—rhesus monkeys, six of them. In the middle of the room was a surgical table of a sort, complete with straps and recording machines. Along the near wall were row upon row of test-tubes containing various residues, a number of cultures growing on filter paper, and a centrifuge. Next to him, and of professional interest to Coltrain, were three Erlenmeyer flasks on ring stands, labeled *glutathione, ceruloplasmin* and *taraxein.* He was familiar enough with taraxein to know it was a blue precipitate formed at one stage in the isolation of the second substance, ceruloplasmin; but what here was labeled taraxein was a viscous fluid of the color of hemoglobin. Liu was concerned with his rhesus monkeys, however, and Coltrain followed him to the cages where he began to point out what he said was the personality of each animal.

"I have induced these," he said, and repeated again when Coltrain did not reply, "I have induced these."

"With LSD and mescaline?"

"No," he said in a way that meant he wanted to be asked but did not intend to explain. "I can produce all sorts of hallucinations. Some of them are quite enjoyable."

"You mean to produce?"

"To experience!" For the first time Coltrain heard him laugh, warmly, politely. "They're harmless. Really, I'll show you, if you like."

"No thank you."

"No? Please don't be afraid. It's a way of relaxing, like watching television. I often take them by myself, or with guests, or with my wife. And you haven't met my wife yet, Mr. Coltrain. I've been quite rude all along. But, then, it is part of a scholar's world to be preoccupied, as I'm sure you know from your own work."

"I haven't been preoccupied with anything for a long time. It's been one advisory position after another."

"I know, I know." He smiled. "Shall we meet Mrs. Liu?"

She looked very much like Liu. But Orientals always seemed to Coltrain to have that symmetry, even to where living together brought a kind of uniform manner and expression. She offered him tea and then dinner, which was more Oriental than was their custom, she confessed later in the living room.

"Have you been with Project Dove long?" Liu asked when she had left them.

"A year," Coltrain said. "There's been quite a turnover in member-

ship—at least as far as the red-room is concerned. I understand the white-room is basically the same group it was fifteen years ago. General Thorpe is the only original on our side."

"He will retire this year."

"I hadn't heard."

"Yes, it was mentioned to me by Dr. Udall when I first came."

"I wonder who'll replace him, another general?"

Liu shrugged and smiled.

"Probably another general," Coltrain repeated.

"He will undoubtedly be difficult to replace, but that won't be our problem. Would you care to see more of my experiments, Mr. Coltrain? I don't want to bore you."

"Not at all."

"I have films of some of my experiments."

He led the way back to the work-room. In the interim of their absence, someone had set up a screen and projector. The cages, too, were covered. Coltrain couldn't imagine why. But then the lights were off and the projector was whirring in his ear like a dentist's drill.

"These are early films," Liu narrated. "Disorganized . . . uncontrolled. You see the animal as she is . . . now the shot . . . watch carefully. The film has been speeded up . . . quite panic-stricken, what is known among the derelicts of your younger generation as a 'bad trip.' Now you'll see the same animal terrified of her water dish. I do not know what she was afraid of. Changes in her body chemistry can be read and classified only as fear or desire. With humans, of course, it is a different thing. The fears and desires can be communicated, the hallucinations identified. . ."

Coltrain looked to the cages, as if to find that rhesus whose trauma he had just witnessed, but there was no sign of life behind the covers.

"She is not there," Liu said, divining his thoughts. "She died as a result of the experience you have just seen. Do you know that her body chemistry was altered in the experiment—permanently? I have tried it over and over—with modifications, I do not like to harm animals, Mr. Coltrain—and always the chemistry was altered."

"Body chemistry changes with every mood. How do you know it was permanent?"

They were watching more of the same experiments.

"Because my other subjects did not die," he answered, as if that explained it. "You will see now one which did not die, Mr. Coltrain."

"Why don't you call me Charles?"

". . . can you see the change? Watch how she behaves toward the others."

He watched patiently as a docile macaque which had previously

shown withdrawal symptoms and extreme anxiety uncurled herself and ambled slowly to the side of the cage. A second monkey clung to the other side. The first rhesus extended its paws through the bars, softly probing. Then suddenly, as if it had decided something, the little beast performed one of the cruelest acts Coltrain had ever seen. The abrupt and ghastly result brought him upright in his chair, heart pounding and breathless. The victim's head was jerked mercilessly through the bars and gouged. The poor, blind creature fell back in a limp heap. The camera quickly resought the deliverer of her wounds.

"—an unfortunate consequence," Liu was saying, "again, an early experiment . . . uncontrolled."

Coltrain looked once more to the cages. There was something all too human about that villain, something premeditated and incompatible with monkeys . . .

"Yes, she is here," Liu said. "But the others know enough to keep away from her. And the change is permanent. You've seen the clumsiest of my results. If you will be so kind as to watch now, I will show you a more timid effect."

Frame after frame chattered through the projector offering nothing to approach that violent scene. Coltrain became bored and sleepy watching what seemed to be an endless display of monkey business, none of which had any special meaning to him; nor could he distinguish what Liu said were the various "induced personalities" of the subjects. Somewhere along the line a sound track was added, somnambulistic hummings that teased and droned in his ears while the endless reel wound transmogrifications of reality and dreams into his thoughts . . . first color, then black and white . . . measured flickerings of light . . . and wheels, winding, winding, winding—"I'm being hypnotized!" he suddenly exclaimed, struggling to his feet.

Liu looked paler than ever in the light of the projector, but he laughed reassuringly. "You see, I am interested in hallucinations. You are only seeing some of the devices I use on the animals—and humans, too; yes, it is quite safe—to put them in the right frame of mind for their blood tests. It is a part of my experiments. My wife and I have fully undergone all phases."

"Blood tests?"

"Body chemistry, Mr. Coltrain. You know?" He seemed a little aggravated. "You said it yourself, you produce the chemicals to suit your mood, and vice versa. It is like a map, only the signs are vague and must be projected—interpolated, I believe you math men would say—so that I am able to predict the extremes."

"Extremes?"

"Of personality. But I must have

samples of blood under varying conditions. If you like, I could tell you a great deal about yourself from a blood test."

"No thank you," he replied, half asleep from the visual aids in Liu's hallucinatory repertoire.

"Really, Mr. Coltrain, for a scientist you are showing a great deal of superstition. I would think you would find it therapeutic, interesting from a scientific point of view. It could mean a significant breakthrough in psychotherapy some day. And besides, it is rather impersonal, not at all an imposition on your privacy."

He couldn't shake the fog from his head. "Maybe, some day."

"Now would be ideal, while you are in this . . . recognizable mood. Of course, if you are afraid—"

"Just a blood test?"

Before it was over, he had given him no less than three samples of blood, one while yet groggy, another after re-watching the rhesus stab her miniature partisans into the eyes of her victim, and a final one during what Liu judged to be a "resting state."

"You must be very tired, and perhaps a little unnerved from the blood tests," he observed, "will you do my wife and I the honor of being our guest for the night? It is very late."

Coltrain looked at the clock on the laboratory wall. It was, indeed, late.

"I sleep very little," Liu said. "I will have some results for you in the morning, if you will stay. My wife will fix your breakfast, and we will leave for Project Dove from here. It would please her. She has little to do since the children have grown."

Coltrain slept badly. It was not the strange atmosphere of the household, nor the tension of increased security surveillance because of a new member at Project Dove that gave him fitful nightmares. He desperately wanted to sleep, but he wandered through the mirrored corridors of semi-consciousness watching shadows and listening after echoes. Some time during the night he felt as though he were roused and taken downstairs. Even conscious he was suspicious of Liu, but in the limbo of his dreams Liu was already tried and condemned as some sort of espionage agent; and in those dreams he fancied he found him downstairs in the company of Tikhonov, Arthur, Lim and Colonel Breck. They were chastising Liu as he sat before them. It was cold and dark where he was, and he was lying down again. He could see them through the open doorway. The light that passed into the dark room fell partly on the wall clock—the laboratory wall clock. As he realized this, there came a low chattering at his side. Something furry brushed his ankle, and a shadow vaulted over him. A monkey was loose, he thought. The specter of

the evil rhesus in the film loomed sharp and real to his sleep-laden mind. He got up to find his way out, but just then Tikhonov appeared silhouetted in the doorway and eclipsed his hopes by closing that door.

"Gentlemen, we have Canton again," Dr. Arthur was saying. Coltrain looked across to Liu there in the red-room, who showed no signs of having spent a restless night.

"And the outpost?" was General Thorpe's rigid demand.

"The outpost is back," said Dr. Arthur, handing the sheaf to Tikhonov.

Coltrain had a headache. The substance of his dreams, come to life there in the "think tank," gnawed tirelessly through his eyes into his brain. The same faces—Breck's, Lim's, Arthur's, Tikhonov's, Liu's and . . . but it was not General Thorpe he had seen the night before, still, someone's . . . someone else later. Those faces had not left him for twenty-four hours. And now, in the same little half circle he seemed to remember from the night before, he faced another ten-hour shift with them.

"Doesn't that fit?" Thorpe was saying. There was another face that belonged there, Coltrain thought, the sixth face seen in his dreams. "We take Canton and right away it's back. They need that outpost, it's their ace in the hole. We should take it!"

"It would be a waste of time," Lim insisted.

"Let me remind you, General Lim," Thorpe began with shaking fist, "let me remind you, we've already wasted five days! Five days! Seven hundred casualties, not to mention the possibility of a diversionary tactic. I say to hell with Canton! Take the outpost, then when we take Canton it remains inaccessible."

"We could use straight air power on the outpost," observed Breck, "take the beachhead at Macao and sweep up to the North."

"Chiangmen is under fire now," Arthur reminded him. "You can't 'sweep' through there."

Tikhonov coughed. It was the prelude to all his comments, and they listened, for he seldom spoke. "Gentlemen, I see no value in chasing so mobile an outpost. However, I agree that it could be of great significance, particularly if it is meant to clear an avenue for nuclear strafing. Mr. Coltrain, you will have to give us an opinion on that. I suggest, therefore, that we ourselves contaminate that area." There was a motionless silence, no one wanted to make a dead-man's territory so near a major seaport as Canton. "I realize what this means," Tikhonov went on, "but it is a long war, and we've already ceded to the enemy more value than we ourselves received from Canton. Remember, gentlemen, this is an all-out Asian war. We are the

Asians! This isn't a border skirmish, by 1990 the world will be slicing the pie for the last time. Sophisticated warfare precludes any other choice in the matter. Territory is territory, contaminated or not. Decontamination will have to wait until possession is determined. We are the ones with too many people! We are the ones with too few resources! We are the ones who must expand and must win this war!"

"—and every nuclear step brings us closer to the last!" Thorpe shouted.

"We had a saying in Russia," Tikhonov went on mildly, " 'hunger is an evil guest.' Soon hunger and famine will put our backs to the wall. Do you imagine for one minute that the Asian forces of the 1990's will bluff at this point?"

"If 'hunger is an evil guest,' then perhaps we should consider the value of the territory involved with respect to the rice crop," said Dr. Arthur.

"Right!" Thorpe echoed.

"Gentlemen," Tikhonov took up, a little harried this time, "we agreed in principle that the strategy involved the ultimate in territorial rights. This is no test case, no dog fight—"

"We could settle this whole thing if everyone agrees that the territory will be contaminated, either by them or us," Breck interrupted.

"That's Mr. Coltrain's area," Tikhonov observed.

"The outpost could well be the vector or fission point of nuclear strafing," Coltrain said. "It's situated right, the territory is suited to it."

"That's incidental to their motive," said Thorpe.

"It was you who suggested it yesterday," Lim reminded him.

"The question is how much do we want to risk today," said Arthur.

"Historically speaking," Liu interrupted softly, "the Asian people have never accepted defeat in spirit. Economic sacrifices are of small importance."

It was Breck who finally consolidated everyone in the idea that the territory would be contaminated, and that they in the red-room risked nothing in taking the initiative. Thorpe remained the only dissenter. Coltrain could not shake the apparition of a face in place of his, a mysterious somebody who belonged in his stead. His dissenting voice only seemed to underscore his isolation from the group. Coltrain's head was aching very badly, and he had to excuse himself. It was then that he saw again the sixth face, a fleeting glimpse there in the washroom. The stranger walked out the door as if he would not chase him, would not stop him. And he didn't. After all, on what pretense could he stop him? He was only a face in a dream. Yet, Coltrain knew it was the beginning of a long association.

Liu continued telling him about his blood at lunch. He had told him only that he was capable of considerable change, that morning. "The amounts of certain precipitates that occur in your changes," he said, "mean that your personality can be altered substantially."

"So I have large amounts of these precipitates in my blood."

"Not large amounts," he corrected, "small. It is significant because it shows you have a low tolerance for them. Large amounts would cause the personality alteration I am talking about. Of course, it is not that simple. There is a nerve complex running to your brain, a sort of emotional thermostat. Some of these fibers must be deadened. It is impossible surgically, but again, with the right chemicals introduced into the blood, the nerves are in fact deadened. If they are repeated at short intervals, the change becomes permanent in a matter of days."

"You've actually done this?"

"Yes."

"On humans?"

"On animals, Mr. Coltrain."

"But you can't predict the new personality," Coltrain said with confidence.

"You can program it. If you understand its nature, you can give it a set of circumstances to suit its personality. It is a very curious thing. You have a whole new emotional tone and no reasons or experiences for it. At this point, suggestion is wholly received. It is as if you had a pile of ashes and were faced with inventing the fire that caused them."

Coltrain never thought to ask him how a monkey could be programmed, or how an animal was prone to suggestion. His headache continued all day. Twice he was forced to leave the red-room, and on the last occasion he saw the sixth face again. He watched him for several minutes. The stranger seemed unaware of him, acting with utter imperviousness, for they were in the washroom, and he removed a syringe from his pocket, took off his coat, rolled up his sleeve and gave himself an injection. Maybe he was diabetic, Coltrain thought. What happened after that was a blur. His headache got so bad he went home and fell asleep.

The next morning General Thorpe failed to arrive at the red-room. By noon security conceded he had disappeared. Security officers interviewed Coltrain for the better part of the day. He learned more from them than they learned from him. Thorpe had left with the others as usual from Project Dove the night before and was driven to his private home where he lived with a solitary housekeeper. She had gone to bed early, leaving him in his study, and no one had seen him since. All the questioning and excitement was not helping his

headache, which was worse than ever by nightfall.

They took their places in the "think tank" as usual the following morning. No one made any reference to the General's disappearance; each understood the suspicion that veiled them all. Coltrain muttered an excuse about his headache to account for his frequent trips to the washroom. Though they viewed the results of the previous two days' actions from the white forces with some suspicions (it seemed likely no major strategy or new weapons would be revealed until Thorpe's fate was discovered), they went ahead with their mock war. And it was strange, Coltrain thought, but without Thorpe there was very little dissension.

He saw the sixth face often after that. It became a natural part of his life, though he could never shake the apprehension that rose in its presence, as it had risen in his dreams. It seemed nebulous, unreal. Just what the stranger's role in Project Dove was, he could never be sure, but he was accepted in silence by the others, and this was a cue Coltrain thought he should take. Three times they met in the washroom, and each time the stranger took another injection. Once he winced with apparent pain, nodding his head palsiedly. On another occasion, they left Project Dove in the same security car. Coltrain watched him in the rear-view mirror. The stranger said nothing but smiled rather smugly, Coltrain thought. He was wholly fascinated by him and unable to break the shell of silence and acceptance that guarded him. In the red-room—the stranger had begun to sit in two mornings after Thorpe disappeared—Coltrain watched him sitting quietly, always quietly, in the mirrored panel by the pneumatic tube. And then midway through a particular session, when the sixth face kept appearing and disappearing with throbbing regularity, Tikhonov leaned close and whispered to Coltrain: "Why don't you speak to Doctor Liu about those headaches?"

"*Doctor* Liu!" he exclaimed. It was the first time he had heard Liu called "Doctor." Liu himself looked up at his outburst.

"Yes," Tikhonov went on coolly, "he has an enviable reputation among psychologists working with psychotic behavior. He may know something of your headaches."

Coltrain stared hard at the Russian, and for the first time saw through his mask. He was toying with him. They all were. Somehow . . . somehow, enemy agents! All, enemy agents—not Asian forces in 1990 but Asian forces now! Tikhonov, Arthur, Lim, Liu, Breck and—and that sixth face.

"—are you ill?" Liu was asking.

"I believe Mr. Coltrain has come to the brink of revelation," Arthur announced nasally.

"He knows," Breck grunted.

"Are you ill?" Liu repeated.

"Just . . . just a headache," he said shakily, trying to identify those swimming faces again. The sixth seemed to have disappeared.

"I have a sedative," Liu said. "Will you allow me to administer it?" He had a syringe in his hand, a bottle with a rubber seal in the other.

"No," Coltrain said. "No shot."

"You don't seem quite yourself, Mr. Coltrain," Liu went on. "Perhaps we should make the decision for you."

Coltrain felt basted in his own chill sweat, as if his flesh were melting and lessening the tangibility of his body, but he gathered the fuel for his last voluntary act with a searing breath and sprang for the white button across the room. A compendium of hopes and frustrations together with his remaining strength formed a vector at the tip of his outstretched finger; but he blundered into Tikhonov, spun around past Lim, who caught the full impetus of a rolling punch on the nose, and into the arms of Colonel Breck some ten feet from the alarm button.

"Relax, Mr. Coltrain," Liu said. "You run the risk of having a broken syringe in you—an unpleasant and dangerous experience, I assure you."

The others struggled with him until his coat was off and his naked forearm exposed. The vein in the crook of his elbow swelled as he strained, presenting a pulsing, tender target for that needle . . .

He came to in the twilight of Liu's living room. Opposite, in a wicker chair, was Mrs. Liu, and in that little lady's hands was a German Luger. When she saw him awake, she got up and backed into the doorway set in a circular frame. Immediately her husband's voice came through inviting Coltrain to enter. He had seen this inner room before, in dreams. The council gathered there was familiar, too, as in the dreams (which he now took to have been drugged reality). The five from the red-room remained seated as he entered. There was no sixth face among them, but a life-size statue presided at the head of the table. It bore a slight resemblance to Liu with its smooth, slightly defined features; the body was undefined, as if cast in one solid piece.

"I see you are admiring our little work of art," Liu addressed him with his unwearying politeness. "Do you recognize it?"

He kept silent.

"How are your headaches, Coltrain?" Lim asked.

There was a general hush while they waited for his answer.

"To hell with him!" Breck exclaimed after that. "I say to hell with him. If he was going to change, he would've changed by now."

"Are you sure, Dr. Liu?" Arthur

asked in more reasonable tones.

"I am sure."

Breck shook his head.

"What do you say, Ivan?" Arthur asked Tikhonov.

Tikhonov rubbed his chin thoughtfully, then rolled a forefinger to the bridge of his nose. He looked at Coltrain as if he should say something to resolve what was to him an enigma.

"Have you been here before?" Liu asked.

"Yes."

"You remember. Good. Do you know why you were here?"

"No. I thought it was a dream."

"He's out!" Breck shouted. "You can't do to people what you do to monkeys!"

"What happened in your dream?" Liu went on patiently.

"I was in your lab," he said slowly, trying desperately to establish what his answers should be.

"That's all?"

What could it mean? Should he be in or out of whatever Breck was referring to? "That's all," he said.

Liu sighed. "We tried to give you a second personality, Mr. Coltrain. Your blood tests, injections, programming on the night you stayed here, all of that—it was part of your permanent hallucination, induced schizophrenia—"

Schizophrenia! It rang a bell. Taraxein was a precipitate used in inducing schizophrenia, only it was supposed to wear off in a couple of hours.

". . . only it seems yours is not permanent," Liu was saying. "You still have the headaches, you see. They are supposed to subside when the transformation is complete. We gave you a final shot a little while ago, and here you are, wincing and blinking with pain."

"What did you do with General Thorpe? Was he a guinea pig too?"

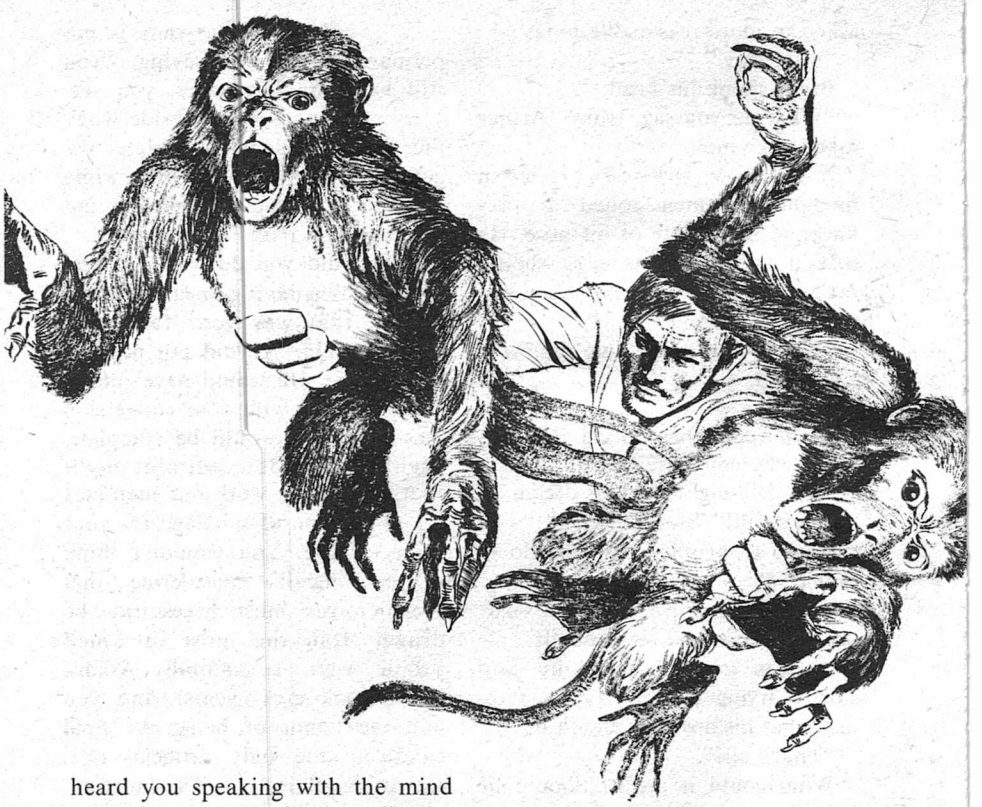
"Ah, that was your fault, my dear Coltrain. We did not need to kill Thorpe. He would have retired this year, and with your conversion our infiltration would be complete. Eight years, Mr. Coltrain; eight years it took to work our members into a position of sabotage for your Project Dove. You wouldn't think it so difficult, considering that Asian forces must necessarily be drawn from the most informed people, who are naturally Asians, but it took eight years! And you had the honor of being the final candidate—the only artificial one. But you've failed . . . I've failed."

"You'll join General Thorpe," Tikhonov decreed.

"I don't understand," Coltrain murmured, pointlessly stalling. "How did I cause General Thorpe's disappearance?"

"Death!" Tikhonov corrected impatiently. "He saw you in your disorganized state—"

"A transition," Liu hastened to explain. "At times you were not yourself. The drugs and the programming were working, and Thorpe observed something wrong,



heard you speaking with the mind of your programmed personality."

Coltrain understood what his mind could not recall. His schizophrenic brother remained a faceless presence when he tried to picture him. He felt his pockets. The syringe had to be kept in the washroom where the big mirror was, since it was not in his pockets, because he knew now that he was the sixth face.

"Enough," said Tikhonov. "We are agreed the experiment failed."

"Intelligence will find Thorpe," Coltrain bullied, "and they'll find me."

Liu laughed sibilantly. "Why should they, when you yourself have been in his presence nearly ten minutes and as yet have not recognized him?"

Coltrain turned horrified once again to the statue. "Thorpe," he whispered weakly.

"A piece of statuary for my garden," Liu interposed, "simple, innocent, his body will remain

forever encased, soon to be transported to a lesser embassy in Washington. And yours, too," he added curtly. "It is the same embassy to which you were to report, had your personality changed. You were programmed for it. Do you remember? 'The dove is in the statue,' you were to say. It was suggested to you under drugs only yesterday. No?" He studied him intently, a little sadly, concluding: "We have indeed failed."

Coltrain's head was aching badly. He felt as he had in the red-room gathering his senses for that mad plunge to the white button. But there wasn't even a white button here; only the laboratory. The door behind him was blocked, but Liu's work-room remained accessible. He maneuvered with disarming slowness to the statue, as if rapt with dumb terror. A feeling like a cloud eclipsing the sun told him when Thorpe's entombed body passed between him and the Luger in Mrs. Liu's hand. At that moment he sprang for the lab door, sidestepped inside and locked it. There wa a telephone on the wall next to the doorframe. He yanked the receiver loose and frantically dialed Udall's number. Through the tumult a foot away he heard Liu's—"He's got the phone!"

"Come on, Udall . . . answer . . . answer—"

"Hello," Project Dove's coordinator interrupted his wish on the seventh ring.

"Udall, this is Coltrain!"

"What . . . Coltrain?" Udall yawned sleepily.

"Listen, for God's sake, Liu's got—" He stopped. There was something aggrandizing about the emptiness of a dead line.

He pressed his back to the panels, letting the blows reverberate through his frame, the threats snarl around his ears. They would have it down in a minute, double bolts and all. He closed his eyes to absorb the giddiness, and when he opened them he seemed to drift forward with euphoric lightness a few yards to where the cages were. He closed them again. The opal-eyed little rhesus fiends were staring at him with bared teeth. Too bad they couldn't help, they were so much like the brutes at his back.

His eyes exploded open, and this time they were lucid with intent. Inspired by a sudden plan, he dodged among the tables, seizing Liu's leather gloves for working with the animals and poking down the row of cages until, not one, but two of the drugged rhesus monkeys launched insane attacks. Their quick stabbing thrusts through the bars made his flesh crawl. One of them must be the blinder of the maimed creature in the film. He let each in turn futilely hook his glove with clawing spasms as he slid the metal bars and turned the catch. Something in that prehensile contact, so remote to his shielded touch, seemed almost childishly

soft, like a little boy tugging its father's arm; but the fleeting ineptness was scourged from his senses by whip-like shrills and an abrasive staccato chatter. The pounding on the door accelerated their frenzy just as he grabbed them. They seemed all too willing, as if they had grabbed him instead, curling over his leather fists with a tooth and nail voraciousness that bathed his hands in sweat. He felt weighted by their squirming hate, swinging them awkwardly forward with him to the door like animated boxing gloves.

Moments later, Tikhonov, Arthur and Breck tumbled straight forward through the shattered door, the latter two rolling clear at the last possible instant, the former having his brow laid open to the bone. Coltrain rushed past into Lim and Liu with his cargo of snarling fury. The furry extension of his right hand swung into the author of its condition. He wasn't sure, but it seemed she caught Liu in both eyes, as she had caught her companion in the film. His left hand flung its burden at Lim, but Coltrain was already through the doorway to freedom before he heard him scream. Somehow he got through the darkened living room to the foyer, threw open the door and escaped into the cold, blue night.

The arbors to his right and left seemed to stir.

"Halt!" someone shouted. "Halt, or I'll shoot!"

The emissaries of that warning whistled above him as he ran. His fate was sealed, surrender or die. But if he surrendered he would die anyway. Being shot appealed to him more than entombment in a statue, so he kept running. Footsteps pounded behind him, gaining. There was a triple staccato tread and an ominous pause as something flew through the air, and he came crashing down with two arms around his legs. He lay panting and shivering. A warm flush flowed under the icy sweat of his brow, making the earth rock gently. He saw the cold, pale moon dripping down the barrel of a cold, pale revolver. His head was aching as it had never ached before.

It was still throbbing in the morning. He sat in Udall's private office, soaking up the warm assurance of freedom.

". . . so I used the hotline to scramble cruising police cars," Udall was saying. "The nearest one probably got to you in under five minutes."

"If you'd waited one more ring to answer that phone, you wouldn't hae gotten even half a message."

"You seemed to have your escape well in hand anyway—"

"But not Liu and his traitors. What about that embassy they mentioned?"

" 'Fraid we can't do anything there. Not that it matters. We assume all embassies in the Commu-

nist bloc aid and abet espionage."

"Like ours?"

Udall turned away without answering.

"What I still can't figure is why Liu's induced schizophrenia didn't work on me," Coltrain said.

"I'm afraid we've used you badly," Udall said, facing him. "You see, we've had you subject to a posthypnotic signal for over a year." He paused for the revelation to take effect before continuing. "You were drugged, made susceptible to suggestion, then awakened with only subliminal consciousness of what happened. We needed an espionage stopgap. Can you understand that? Somebody we could tap for the truth if things got suspicious in the red-room."

"So you pegged me as the number-one security risk," Coltrain said angrily.

"Not at all. We just wanted a check against total infiltration. It could've been anyone. Anyway, it was probably your subconscious role that blocked Liu's schizophrenia inducement."

"But as an espionage stopgap it was a flop."

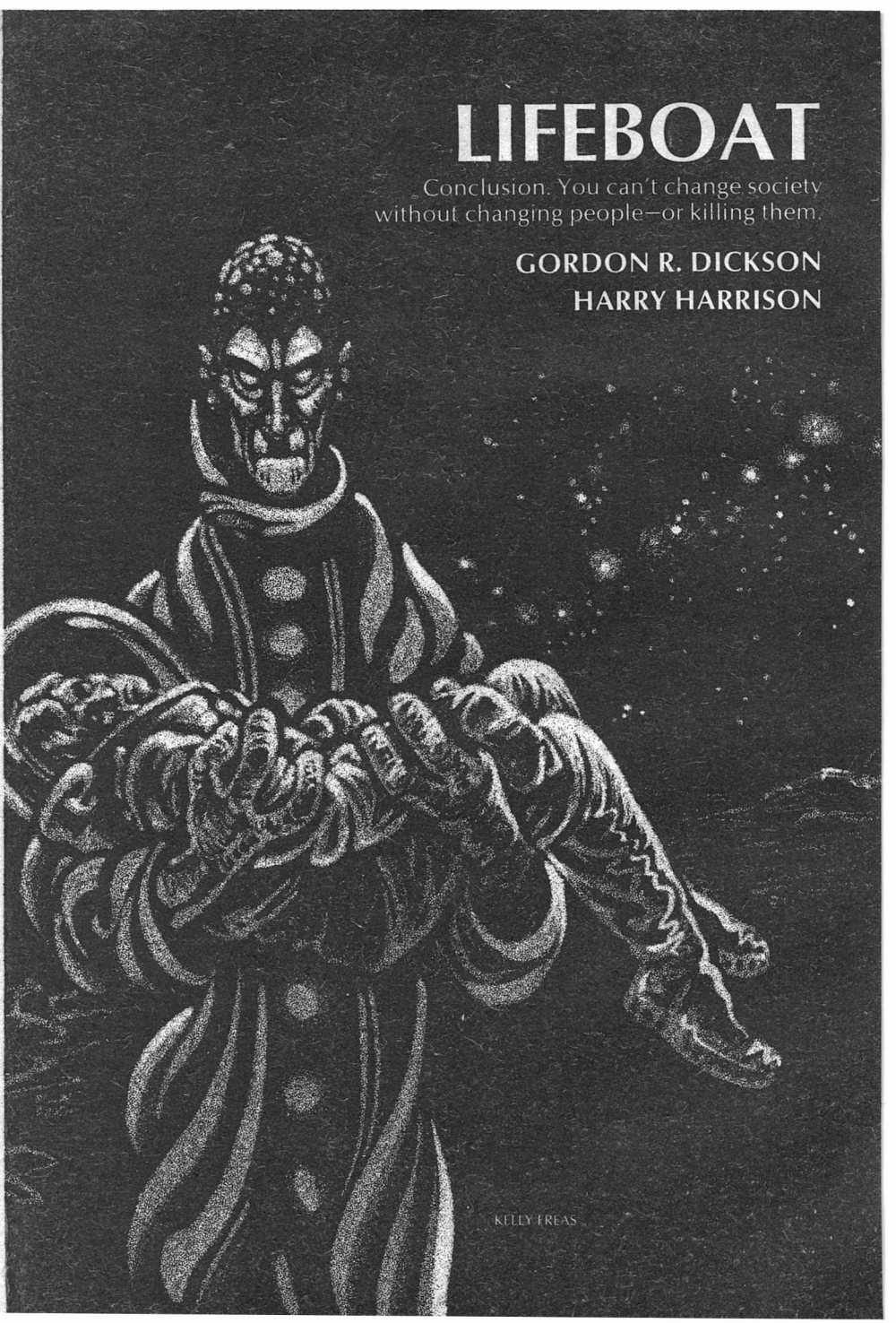
"We read you with a posthypnotic signal after Thorpe disappeared. You just didn't know anything then . . . apparently."

Apparently. That was an important word, even if Udall didn't know it. It occurred to Coltrain that it might've been his emerging second self, the one Liu was creating, that had kept even his suspicions from surfacing in the posthypnotic reading. Maybe they had checked each other. It was an unresolved end, like the embassy in Washington that was still viable for foreign agents whether in white-rooms or red-rooms, or anywhere else.

He was being reassigned, Udall told him then—to the white-room. It was quite a shock. A week off and then to the white-room and the Allied forces. He took himself and his throbbing head downtown to a little bar. Even security did not know about this, he fancied. He could drown his headache sip by sip in the drowsy depths of an amber drink. But Liu and his schizophrenic rhesus monkeys seemed to be swimming in that first glass. Liu was gone, he suddenly realized, and all at once his headache was gone too. It was gone! He couldn't have been more surprised if he looked down and found an arm missing. All that time, and now it was gone! He thought about the whole business—Udall and Thorpe and Coltrain. And the other six—Lim and Liu, Breck, Tikhonov, Arthur and himself.

There was a number he had to call in Washington. He went to the private booth in the corner. It took all the change he had, and the operator had trouble with the area code, but then it came through.

"The dove is in the statue," he said. ■


LIFEBOAT
Conclusion. You can't change society without changing people—or killing them.
GORDON R. DICKSON
HARRY HARRISON
KELLY FREAS

SYNOPSIS

A large passenger spaceship owned and operated by the Albenareth, an alien race which makes a religion out of going into space and which has become the supplier of interstellar transportation for the human race traveling between Earth and its Colony Worlds, is wrecked by a mysterious explosion. The only individuals to reach a lifeboat and escape are two Albenareth and eight humans. The two aliens are the Albenareth Captain, and the Albenareth Engineer. The humans include Giles Ashad of Steel, *an Adelman (one of the aristocratic management class), plus a handful of arbites (members of the human working class).*

The three female arbites are an older woman named Biset, a capable-looking younger girl called Mara, and a second girl named Di, who is married to Frenco, one of the male arbites. The three other male arbites are an older calculations man named Groce, an arbite named Esteven whose work-area is music, and a manual-laboring arbite named Hem.

The Albenarthian lifeboat is a small craft with a primitive closed ecological system: the sanitary conveniences attach to the nutrient tank which feeds the ib *vine, a plant which both regenerates the atmosphere aboard the lifeboat and produces fruit to supply the passengers with liquid and solid nourishment.*

The lifeboat has no permanent compartments. But there are temporary partitions which the humans erect to divide the body of the ship roughly into three sections, not counting the Control Section up front, which has its own special pull-down screen. It is behind this screen that the Captain and Engineer spend most of their time.

Giles, as the only Adelman aboard, automatically takes command of the other humans. He calms the arbites, sees that they set up the partitions and pull their cots from the flooring of the lifeboat. Then he goes forward to talk with the two Albenareth in their own language. In all these things he has drawn upon the unlimited education which has been his right as one of the Adelborn (as opposed to the arbites, who are given only a limited education, for which each must sign a forty-year work contract). Giles speaks to the Captain, discovering she is female (the Engineer is male) and he decides to keep this knowledge a secret from the arbites because of their superstitions about the danger of the Albenarthian female when she is sexually excited.

The Captain, whose courtesy title is "Rayumung" (as the Engineer's courtesy title is "Munghanf") tells Giles that her honor demands that she continue with the lifeboat on the starship's original course to the planet Belben—even though Giles points out that there may be a much nearer human colony. He has, in fact, a small mining world in mind, called 20B-40, less than half as distant from them as Belben. But the Captain refuses to consider it.

Giles has his own reasons for wanting to go to 20B-40. He carries a warrant for the arrest of Paul Oca, another Adelman. Paul is the founder of the Oca Front, a philosophical-liberal society of which Giles is a member. Paul, however, has become more and more radical, finally advocating that the Adelborn's unlimited education be made available to the arbites immediately.

Now Paul is being hunted by the World Police. He has escaped from Earth to a Colony World, plainly with the aid of some revolutionary arbite group. Consequently, the Oca Front (which advocates a more gradual relaxation of education restrictions and of the rigid Adelborn-Arbite system) also is searching for him in the person of Giles, whose job must be to assassinate his old friend so that the arbites cannot make use of him as a leader in a radical revolt against the existing system. Giles has information that Paul is on 20B-40; and is following that information although he hates

the job as assassin. Still, the sense of duty trained into him, he knows, will compel him to go through with it when the time comes, just as the same sense of duty makes him an instinctive protector and guardian of the arbites aboard, when the Captain suggests that one of them be destroyed to produce a more desirable number aboard the lifeboat.

Giles, having failed to talk the Captain into changing course, finds them all faced with a repair that must be made outside the lifeboat. The Engineer will do the actual work, but the Captain and Giles must help from inside the ship. The spacesuit the Engineer must wear is old and probably unsafe—in fact, most of the Albenareth spacecraft are aged and in bad repair, reflecting a cultural problem producing decay toward a dead end among the alien race. The Engineer is probably going to his death, but he considers it holy to die in space.

The Captain and Giles put protective ties around the limbs of the spacesuit. While Giles is practicing his part of the job, he is approached by Biset, who reveals that she is a World Police spy and warns him to beware of Mara, whom Biset believes to belong to the notorious Black Thursday *arbite revolutionary group. The Engineer goes out and makes the repair; but when Giles, at the Captain's direction, manages to get the Engineer back inside, it is clear that his spacesuit has failed and that he is dying. The Captain takes the Engineer into the back section of the lifeboat and warns all the humans to stay out.*

Giles, exhausted, falls asleep on his cot—as do the other humans. They are awakened by a woman's screams; and Giles, leading the way into the back of the lifeboat, finds the area spattered with dark alien blood and the Engineer's body already fed into the nutrient tank that supports the ib *vine. Di dangles unconscious from the Captain's long, powerful, three-fingered hands. The Captain hands the girl to Giles, and stalks forward to the Control Section, refusing to explain what Di was doing there and what she has seen to make her scream so.*

Nor does Di remember. She is emotionally disturbed following this experience and will not let any of the men near her.

Hem is now sleeping on a cot in the front section, which Giles formerly had to himself. Giles finds the big laborer crying silently to himself, and discovers that Hem is miserable without his barracks-mates. Looked down upon by the other arbites, Hem has been suffering acutely; subconsciously he has come to identify himself with Giles, who is the only one aboard anywhere near the physical equal of his mates. And, of course, any friendship between him and an Adelborn is consciously unthinkable.

Giles soothes the big laborer and returns to the problem of getting the Captain to change course.

Two days later a fight erupts between Groce and Esteven. Esteven wants a page from an ancient mathematics book Groce has had in his family for generations; but when Giles intervenes and Esteven learns that the paper pages of the book have been plastic-impregnated, his interest in it disappears.

Mara calls Giles aside to show him some withered leaves and spoiled fruit on the ib *vine. Giles takes these to the Captain. But the Captain is indifferent. Giles accuses her of not expecting to reach Belben, herself. Unexpectedly, she agrees, and for the first time admits she is now pregnant by the dying Engineer in the last few moments of the Engineer's life. Her child has been deliberately conceived in order to create a new life without the dishonor that now binds her; someone who can successfully carry on the search for whoever destroyed her ship and caused her to lose her honor.*

Having told Giles this, she closes her eyes and refuses to discuss the matter further.

Later, Giles is awakened from sleep by an odd noise. He discovers the Captain throttling Esteven, who has tried to get at the Captain's navigational book. Like Groce's book, the alien's navigational book harkens back to a time of paper pages. Giles, by accusing the Captain of destroying property—meaning Esteven—she does not own, makes the alien release the man. Later Giles talks to Mara, and almost feels that he is beginning to make friends with her when he passes on the word that Biset suspects her of possibly belonging to the Black Thursday Revolutionists. For some reason, however, this warning erects an invisible barrier between them. They part, and a little later Biset approaches Giles to warn him that he's been giving Mara more license than he should. Giles starts to explain, then erupts in fury at himself for condescending to do so to an arbite. He orders Biset out, goes directly to Mara, and under cover of the sound of music from Esteven's recorder, warns her that Biset may accuse her of having planted the bomb which blew up the spaceship. She asks him how he can be sure it was a bomb that destroyed the ship and Giles tells her he was the one who planted it.

His intention had not been to blow up the ship, but to cause enough damage to make it turn aside to 20B-40 for repairs. Apparently, however, the Albenareth craft was so old that the damage done was enough to destroy it.

They continue on course for Belben. By the tenth day the ib *vine is threatening to fail in its job of providing enough fruit to keep them alive. Giles discusses the situation with Mara and confides in her about the Captain's condition. Mara asks him why he, Giles (who like all Adelborn has piloted his own space yacht around the Solar System) cannot take over and pilot the lifeboat*

to 20B-40; and Giles tries to explain the greater problems of interstellar piloting.

A little later, Giles is wakened by Esteven, who demands paper. Giles is about to oblige him with a souvenir—a sixty-year-old banknote—when he realizes the man is a tonky-head, addicted to a drug which can only safely be absorbed by the human system if accompanied by cellulose. This was the reason for Esteven's attempt to get his hands on a page of Groce's book.

Giles refuses Esteven the banknote, and walks away from him. A few moments later, however, Esteven, wailing, charges the Control Section. He has plainly taken the drug without the protective cellulose and is now out of his head, coming after the navigational book.

Hem stuns the addict with a blow from his fist—but not before Esteven, who has broken off the rusted metal handle of the ib *fruit-press, strikes Giles a blow on the head.*

Staggering, Giles manages to hold off unconsciousness until he succeeds in arguing the Captain out of killing Esteven. Then he lapses into unconsciousness.

When he comes to again, five days have passed. The lifeboat is now almost at the farthest point at which it can alter course for 20B-40.

He goes to the Captain and makes her a final offer. If the Captain will change course to 20B-40, Giles gives his word to identify for the Captain the human who is guilty of sabotaging her ship. In fact, he promises to turn that human over to her, to do with as she will, once they are on 20B-40.

The Albenareth are aware that the word of an Adelborn, once given, is never broken. The Captain accepts Giles' offer, and begins the first of two alterations in course that will change their direction to 20B-40.

Part Three

11

Sixteenth day—17:09 hours

"I don't want," said Giles, "any of you to think the situation isn't still serious, because it is. We have twenty-seven days yet, minimum, to survive on board this lifeboat; and the *ib* vine, as you know, has been putting out less and less fruit, for reasons the Captain doesn't understand any more than we do. Something seems to be poisoning it. I'm not sure but what the Captain thinks that it's us—we humans—that are the poisonous element. But the important thing is we're facing a situation with less and less fruit. Now, we can do without the food for twenty-seven days if we have to—but that fruit juice is our only source of water. So keep that thought in your minds and try to get used to using as little liquid as possible."

Giles had gathered the arbites—including Esteven, who was by now

somewhat recovered—into the middle section of the lifeboat to brief them. He had just finished telling them the truth about the Captain's sex and much of what had gone on between the Captain and himself in his efforts to get the course of the boat changed to 20B-40. They had listened in silence, except for a general murmur of excitement when he had explained that they might be getting to planetfall earlier than had been expected. But generally, they had reacted less than he had expected.

He was being forced to the conclusion that they had never really appreciated the danger of the situation they were in. If not, perhaps they did not understand, now. It was a thought that gnawed at Giles as he looked about at them.

"You've followed what I said, have you?" he demanded sharply. "You realize what we're up against? It's going to be a real test of willpower and physical determination to survive. You've got to keep your spirits up and your exertions down. Now, you understand that, and the seriousness of the situation, even with this course change?"

There was a pause and then a mild murmur of agreement from them, interrupted by a small but curious noise from the front of the lifeboat, where the Captain was out of sight behind the control area screen. It had been a sound almost like that of an Albenareth clearing her throat—almost as if the Captain had been listening to him from the bow, and now was politely signaling her desire to say something.

Giles looked toward the front. So did all the rest, but the noise was not repeated.

"What was that?" asked Mara.

"I don't know," Giles said. "It's about time for the Captain to be making the second course change to put us on target for 20B-40. Perhaps something's come up . . ."

He got to his feet.

"Stay here," he said to them and went forward.

He reached the edge of the screen and stepped around it. The Albenareth navigation book had been rotated upon its stand so that its pages faced the closest command chair. In that chair, the Captain sat, arms on the arm supports, back stiffly upright against the back of the chair, her eyes closed.

"Captain Rayumung?" said Giles in Albenareth. *"Is there something of consequence? Some problem?"*

There was no answer from the alien figure. No movement, no response of any kind.

"What is it, Captain? What's wrong?" Giles demanded.

There was still no answer. The Captain's mouth was slightly open, her breathing light, and her body utterly motionless. Giles reached out and gently lifted one of the dark eyelids. The pupil was rolled up out of sight.

"What is it?" he heard the voice

of Mara at his elbow, and turned. Against his order, they had all followed him forward and they stood now in a semi-circle, gazing at the Captain.

"She's unconscious," Giles answered. "I don't know why. Look at her, Mara. See if you can find any reason."

Mara pushed past him and felt for a pulse in the Captain's long wrist. After a moment, she abandoned that effort and lifted an eyelid as Giles had done. Then she ran her hands over the Captain's body, feeling here and there until her fingers came to rest at last on the back of the Albenareth neck, just below the bone of the round skull.

"I've found it," Mara said. "A pulse. Has anyone got a chrono? No? Groce, can't you give me a second count, somehow, from that compute of yours?"

"Of course," said Groce. He punched controls on the compute and began counting out loud as he watched its display screen. "One . . . two . . . three . . ."

Mara let him count to thirty before she let go of the Captain's neck.

"All right," she said, "You can stop." She turned to Giles. "She's alive, Adelman. But I can hardly believe it. Her heartbeat's only about sixteen counts per minute. Do you know if their pulses are naturally that much slower than ours?"

"I don't know." Giles shook his head. "But I doubt they can be that slow. They don't live any longer than we do; and they're warm-blooded and just as active. A heartbeat that low, from a normal resting pulse rate of around seventy, as in humans . . ." He searched his memory but couldn't come up with any exact comparisons. "At any rate, it sounds like the Captain's in a coma—or a state of hibernation, or something like that."

It was Biset who put into words the question that was in all their minds.

"Did the second change in course get made before she folded up?" Biset asked. "What do you think, Honor, sir?"

"I profoundly hope so," said Giles.

He looked around the control board, but to his human eye it held no information that would answer Biset's question.

"I'll study these control consoles," he said, "and see what I can figure out. There's no reason for us to assume the worst until we know for sure. The Captain particularly wanted to—" he checked himself. He had not told the arbites, of course, of his offer to give up the one responsible for the bomb, once the lifeboat made planetfall on the mining world. "She had her own strong reasons for wanting to get to 20B-40. This coma, or whatever it is, may be a natural state with Al-

benareth, at a certain period, when one of them is carrying young. She would have known the collapse was coming and made sure she made the second course correction before letting herself fold up like this."

"And if she couldn't help it?" Mara asked.

"I'm sure she could," Giles said stiffly. "Find a cot for her and put her on it. Go on!" he snapped at them, angered by their hesitation. "She won't poison you if you touch her."

Goaded by his voice, Hem, Groce, Mara and Biset picked up the limp alien body and carried it away. Giles went back to examining the control area.

Ignoring the fact that he did not understand much of the instrumentation, he examined what there was to examine, item by item. It was all alien, but none of it was totally unfamiliar. Many of the items were counterparts of what he had seen in the control area of his own and other space yachts, other instruments were understandable in terms of his limited knowledge concerning interstellar navigation. Still others—like the viewscreen—were obvious appurtenances for this kind of craft. Regardless of how familiar each item was, however, he gave it the same minute examination he'd have given it if he had never seen anything resembling it before.

He drew a blank.

Not only was there no sign of anything amiss—there was no clear evidence whether the Captain had made the second course change or not before lapsing into her present state of unconsciousness.

He was about to turn away and give up for the moment while he attacked the problem from the angle of pure speculation and rationalization, when the navigation book caught his eye.

If he could only understand the information contained in it, he thought, he could probably zero in on the answers he needed. It was impossible for him to actually understand it, of course—not merely because of the alien mathematics involved, but from the viewpoint of the whole system of navigation of which it was a part. But he glanced at the pages of the book, anyway. Each page was a double column of short lines of what could best be described as squiggles—the sort of apparently meaningless marks which Arabic seems to be to untutored Western eyes.

Then he saw the raw edge of torn paper between the two open pages, in the spread spine of the book.

He stopped and bent his head to look more closely.

There was no doubt of it. A page had been torn out of the book. Why would the Captain—

Esteven!

"Esteven!" roared Giles. "Come up here!"

There was a moment, and then

Esteven appeared, pressed along—*hustled along* would perhaps be a better phrase, Giles thought—by the others. Giles let them crowd the man up to him; then he turned and pointed at the book.

"Esteven—" he began.

Esteven burst into tears, falling on his knees. He clutched Giles around the knees and clung to him. He was obviously trying to explain himself, but the explosion of his emotion made him impossible to understand.

"I called for Esteven," Giles said. "Did I ask for the rest of you?"

Embarrassed, they backed off and disappeared through the opening in the first screen. He kept staring after them until they were all hidden from his gaze; then he reached down and lifted Esteven to his feet.

"Now tell me," he whispered. "When did you tear a page out of this book? While I was unconscious?"

"No . . . no . . ." sobbed Esteven. "It was before . . . long before. Back before the pru . . . the Captain caught me the first time. Believe me"—Esteven grasped Giles' arm frantically—"I'm not lying. I wouldn't lie to you. You saved my life, three times. First by not letting the Captain kill me the two times she was going to, and then by helping me kick the tonk. I never believed anyone cared whether I lived or died. But you cared—and you didn't even know me, except that I was on this lifeboat with you. I'd do anything for you. Believe me—I only took one page, a long time ago. Just one page . . ."

"All right," said Giles, embarrassed by the man's naked display of emotion but moved by him, nonetheless. "I believe you. Now, go back with the others; and don't tell them what I talked to you about. Don't tell them you ever took a page. Understand?"

"Thanks . . . thank you, Honor, sir . . ." Esteven backed away, turned and went.

Giles turned back to the book. There was a cold feeling in him. He thumbed through the pages preceding and following the one that had been torn out, trying to see if he could find any marks that could represent page numbers. There were no such marks; but in spite of that, his suspicion grew and grew until they were so close to certainty that he was half-prepared when Mara spoke unexpectedly behind him.

"So, that's why the Captain collapsed," Mara said, quietly, as if the information was not a matter of life or death, but only something from which casual conversation was made. "She turned to the page needed to make the second course correction and found that Esteven had already eaten it."

He turned sharply.

"Don't assume—" he began, but she cut him off. For such a small

girl, it was wonderful how she always appeared to be able to meet his eye on a dead level.

"We're not fools or innocents, Adelman," she said. "Please don't try to treat us as if we were."

He looked at her soberly.

"All right," he said. "You're very probably right. Esteven stole a page from this navigation book sometime before the Captain ever suspected him. And it may be that the page he took and ingested was the specific page that the Captain needed to make the second course change."

"Which means," she said, "that the second course change was never made; and, far from being headed for 20B-40, we aren't even headed for Belben. We're headed for nowhere."

"Yes," he said. "I think that's likely." He stared at her. "You take the news very well. In fact, Mara, you amaze me. You're standing up to most of the disasters of this voyage better than any of the arbite men aboard. The only one who comes close to you in that way is Biset—and she's a woman, too."

"Women have always been the stronger sex, Adelman," Mara said. "Hadn't you heard that?"

"Yes, of course. But you're—" he caught himself, but she finished the thought for him.

"We're arbite women? That doesn't make it less likely—it makes it more. When the men of an oppressed group are beaten down, that tends to make the women stronger, not weaker. Necessity makes them stronger."

He nodded, slowly.

"Sometime, when this is all over," he said, "perhaps we can argue about that. But right now neither one of us ought to be wasting strength on argument."

"What are we saving our strength for?"

"For . . ." he smiled, as grimly as she had smiled at him on occasion. "Mara, you may have given up. I haven't."

Her manner softened suddenly.

"Good," she said. "I knew you wouldn't. Then you actually will take over the piloting, and make the second course change to get us to 20B-40?"

"Take over the piloting?" Her casual assumption that he could, almost took his breath away. "I've tried to explain how that isn't possible."

"What else is there to do?" she asked. "If you haven't given up it's because you still think we can get to 20B-40. And if we're going to get there, who else is going to manage it?"

He laughed. It was a laugh so full of irony that it surprised even him. Whether it surprised Mara, he could not tell. He swung back around to look once more at the alien controls.

"All right!" he said. "Leave me alone for a while. Leave me alone here to study things; and if there's

a miracle capable of being worked, I'll try it!"

12

Twentieth day—20:45 hours

"All right, Groce," said Giles. "I want you to sit there and listen to me. And I mean, *listen.* If you don't understand what I mean, tell me. Interrupt whatever I'm saying and tell me right away. This isn't a situation where you can—"

He checked himself, as he had come to do so much lately. He had been about to warn Groce that this was not the kind of work situation encountered on Earth where it was safe to pretend understanding when understanding was actually not there. Now, some new sensitivity stopped him.

"This isn't," repeated Giles, "a situation where we can take the chance that you and I don't understand each other. You follow me?"

Groce nodded. The man's face hardly differed from its usual expression; but Giles felt a sense of excitement rising almost like steam from the small body in the command chair next to his.

"All right," said Giles. "Now, I do know the broad outlines of what needs to be done. First, we have to establish where we are—what our position is as a moving point along the line of our course. Then we have to establish the position of the destination we want—again as a moving point along the line of its course; and from this, work out the direction and angle of change we want in our present course to take it toward that destination."

To Giles' surprise, Groce nodded. "Sounds simple," said the arbite.

"That's probably because I'm making it sound simple," said Giles, "so I can explain it. The fact is that it isn't that simple at all. For the Captain it was. She took observations with the equipment here, or a figure from her book, to locate her ultimate destination, then referred to the book in other ways I don't know anything about, in order to translate that information into heading and correction factors. I can make observations with the equipment—I can do that much. I can also set a heading and correction factor into the drive control. But the gap lies in what the book would have told the Captain. How do I derive correction figures from the position figures I get by observation?"

"Why the correction?" Groce asked.

"Because this lifeboat's powered by a warp drive, like the Albenareth spaceship was," Giles said. "You can't feel it, but about once every eleven minutes the drive is kicking us into warp space and back out again. We cover immense distances of normal space every millisecond that we're in warp, but we don't keep moving there more than a few milliseconds because in

warp our motion's got only an eighty percent possibility of being correct. You understand? We're going in the right direction only about eighty percent of the time. Given the proper correction factor, the lifeboat's computer would keep recalculating our path back on target for our destination and putting us on it. But even with this, if you could see us from the outside, it'd look like we were wobbling through space in a very erratic manner. Unless we can establish a correction factor, we'll have to stop and recalculate our position by hand, every time we go in and out of warp—several hundred times every ship's day—until we're inside the solar system of our destination planet. And it'll take us a thousand years to get there—a thousand years we haven't got."

Groce shook his head with continued and determined optimism.

"This compute of mine, and me," he said, "can give you any constant you need, if I've got the rest of the elements of the problem. How do we start?"

"We start," said Giles, grimly, "with me trying to apply interplanetary navigation to interstellar space. Basically, what we're up against is a problem in solid geometry, only with moving instead of fixed points . . ."

He continued explaining. It was a curious situation. Essentially, before they could come to grips with their problem, they had to educate each other. Groce, Giles found, was number-minded rather than space-minded.

Giles had to search and struggle for ways of presenting that problem to Groce in math terms the arbite could understand and use.

"Look," said Giles, "visualize cutting a triangle out of cardboard, or something of that nature, and holding two points of it with thumb and finger."

He held up his thumb and middle finger to illustrate. Groce nodded, frowning.

"The point—the angle that you aren't touching is free to rotate in a circle," Giles went on. "You understand?"

Groce nodded.

"All right," said Giles. "Assume the two angles your fingers are touching represent known positions. Then your position—the angle you aren't touching—lies somewhere on that circle; and to pin it down to an exact location, you take a third known point and measure the angle between it and either of the first two."

"Ah!" said Groce, his face lighting. His fingers danced over the keys of his compute, in self-congratulation at his own understanding, as a musician might play with his instruments in a like situation.

"The first three points," Giles went on, "need to be unique in appearance, outside the Galaxy, and a comfortable distance from the Galactic plane—you remember my

explaining to you what the Galactic plane was?"

"Yes," said Groce.

"All right, then. Three such suitable points might be S. Doradus, the nucleus of the Andromeda Galaxy, and the nucleus of the Whirlpool Nebula—that's M51 in Canes Venatici—"

"I don't—" Groce began.

"That's right," said Giles, "you don't know anything about these names I'm mentioning. Don't let it bother you. The point is that they're outside the Galaxy, out of the Galactic plane, and recognizable from anywhere *in* our Galaxy. The point I want you to understand is how we use them to determine our position."

"I understand that," said Groce, vigorously.

"Good," said Giles. "Then I'll go on. Now, using those reference points I just mentioned will just give us a general location in our Galaxy, so general it very nearly includes the Solar System, Earth, Belben and 20B-40 all at once. In practice, after getting our general position with these points from outside the Galaxy, we'd have to consult star charts and pick three bright, known stars closer to us and refigure to get a more precise location. But, as it happens in this case, we don't need to do that. I studied the stellar neighborhood of our original route to Belben and I know roughly where we are in a general area."

Groce nodded. Evidently, it did not occur to him to ask why Giles should have gone to the trouble of studying the star maps and other necessary space navigational material.

"I also know the position of 20B-40, in reference to the area of space it inhabits, and the larger stars of its neighborhood," Giles went on. "So the only thing we need to discover is our own position right now, as precisely as possible, and the angle from that to 20B-40. We've only made one course change at the Captain's hands since we left the original route to Belben, and I'm betting that this involved a single phase shift. Consequently we shouldn't be more than one phase shift off our original line of travel and still in a stellar neighborhood where I can recognize the larger stars and other light sources visible in the screen there—" He pointed. "In fact," he said, "I do recognize them. So calculating our present position should be relatively simple. I can use the control section of this lifeboat well enough to take angle readings on the three stars I've pointed out; and that gives us our location, from which we can figure the angle from our present direction of movement to 20B-40. Then we're ready to make a correctional phase shift."

"What about what you talked about earlier?" asked Groce. "Everything you've mentioned so far is simple. I could run the calculations

on something like that in my sleep. But what about that correctional factor you mentioned? Didn't you say we had only an eighty percent chance of moving correctly through warp space even after we shift the lifeboat on a correct course?"

"That's it," said Giles. He sat back with a heavy exhalation of breath. "That's the real problem. The correction factor represents a tendency for the vessel to drift in warp space. The drift is different with every vessel and each separate course it takes. The Captain got it from her book. Somehow we've got to work it out for ourselves—the particular adjustment figure that applies to this lifeboat and the unique course that exists from where we are at this moment to our destination of 20B-40."

"How?"

Giles sighed again. "The only way I can think of," he said. "We've got to calculate our course, then shift and recalculate our new position, to see how far off we are when we come out of shift. We keep that up, shift after shift, until we accumulate enough data on the error per shift to guess at a constant correction factor. In other words, something that the lifeboat would do automatically, every few minutes or so, we're going to have to do by hand, over and over again, until we learn enough to estimate a correction factor."

Groce scratched his head.

"Well, Honor, sir," he said, "we might as well get started, I suppose?"

They got started. Theoretically, Giles had told himself, it was just a matter of doing the necessary work, sticking to it until enough data could be accumulated. Sooner or later they would have it done. Then would come the unsure part—the guessing at a correction factor, and with it worry. But up until that point he expected things would go with fair smoothness.

But they did not. For one thing, the *ib* vine had been becoming steadily less productive all the while, and this was now becoming a factor that influenced everyone aboard.

The tiny food ration per person that the vine produced seemed adequate—no one had any real appetite. But the amount of juice the pulp produced was now noticeably less than what they all would have preferred, even those who at first had found the juice sickly-sweet and unsatisfying. Thirst ruled everything. There were always at least three or four of them awake at all times now, keeping a jealous watch on the fruit picked and on the juice container. Their skins were tight and shiny, their mouths always dry. They looked at each other with suspicion.

To complicate matters, there was the Captain, still lying on the cot where they had put her, breathing so slowly it was hard to tell if she breathed at all, neither alive nor

dead—but able to swallow automatically the daily ration of juice Giles insisted the alien be given along with everyone else. Mutterings about the waste of that ration of juice rose among the others and finally forced Giles to leave his calculations and face them all down.

". . .But why?" Di wailed. "She's not even human. And she's the one who got us in this fix! Anyway, she's probably already as good as dead—"

"She's alive!" snapped Giles. His own thirst had brought him close to the end of his tight-leashed temper. "If we refuse an Albenareth care in a situation like this it'll give the Albenareth an excuse to refuse care to humans if the situation is ever reversed and it's the Albenareth who've got the chance to keep the juice, or whatever's needed, for themselves. We've got a responsibility to treat this alien just exactly the way we'd want ourselves treated if it was the other way around."

"Damn the responsibility!" muttered a male voice. Giles looked about quickly and met the sullen eyes of Frenco, Groce, and Esteven. Only Hem returned his gaze without hint of mutiny.

"We won't damn responsibility or anything else," Giles said slowly, looking from face to face at each one of them in turn, "while I'm here. Is that clear?"

They made no sound. They were not yet ready to defy him face to face, but from then on, he made a point of breaking off work and watching when it came time for one of the others to lift the alien head and hold a partially-filled cup of the precious juice to the unconscious lips. Twice he caught one of the men going through the motions with an empty cup. After that he gave himself the added task of actually bringing the juice to the Captain and getting it down her throat.

Meanwhile, even the calculations in which he and Groce were engaged did not go well. Under the nagging discomfort of his continual thirst, Giles blamed himself for not being more clear-headed when the first of the obviously wrong results showed up. But he reminded himself that Groce's compute was, after all, immune to thirst. He painstakingly recalculated with the other man's help, found a difference he was too weary to check out, and carried it through to a conclusion that appeared to check out.

But the same thing happened several times; and in a moment of fury he snapped at Groce, who exploded in denial.

"Wrong? How can I be wrong? I've never made a mistake. Never! It's your figures that're wrong—Honor, sir!"

The "Honor, sir" came out as an obvious, if not intentional, afterthought. Groce did not stop at that, but continued on for some seconds

in an injured tone of voice, reiterating how impossible a mistake was on the part of himself and his compute.

"All right, all right. I believe you," said Giles, finally. "Now, let's drop the subject and recalculate."

They did. But in spite of going over this particular calculation twice more, they still got a figure that was obviously wrong.

"We can't have moved that far on the last warp shift," muttered Giles. "That much of a shift would give us an error greater than our total progress . . . Groce, let me see that compute!"

Groce handed it to him reluctantly. Giles examined it, but could find nothing out of the ordinary about it. It was simply a sealed box with ranks of keys with either numbers or symbols on them. Even if he could open it up, he would not be able to tell if anything was wrong with its interior construction; and Groce knew no more about that than he did.

"All right," said Giles, handing the instrument back. "We'll do it once more, from the beginning, slowly, and double-check every step as we go."

They began the recheck. In spite of himself, Giles found he was watching each calculation Groce made with a sort of paranoid intensity. Many of the motions Groce's figures made on the buttons were meaningless to Giles, but when the other man entered the compute figures that Giles had just told him . . .

"*Groce*!" roared Giles, suddenly—and Groce's fingers checked abruptly on the keys as if arrested by a paralytic spasm.

"Groce—" Giles' voice was lower now, but snarling. "Groce, that was a nine I just gave you. You punched a five."

Groce raised his eyes from the compute, his mouth open to protest. But no sound came forth. Seeing the expression of the other as a mirror to his own, Giles realized that there must be murder written on his own features. Words came softly, viciously, from his throat without his willing them.

"So," he said, "you never make a mistake, you and your compute? You never make a mistake . . ."

His voice was rising in spite of himself. A madness born of thirst and frustration was beating in a pulse at his throat. He was beginning to rise from his chair—when an unexpected hoarse shout from Hem broke in on the mounting tide of his fury . . .

"Let go—stand back. Honor, sir—come! Come quick!"

Giles bolted from his chair and brushed past Groce, who was in the outer of the two command chairs. He went with long strides back through the openings in the two screen partitions, to find all the others clustered around the cot where the long, dark body of the Captain lay. Hem was holding Bi-

set by the shoulder with one massive hand. His other hand was clenched in a fist with which he was warning the others back.

"Honor, sir!" he said, his face lighting up with relief as he saw Giles. "I knew you wouldn't want them to. I told them you wouldn't. But she went ahead anyway—"

He gestured toward Biset with his fist. The policewoman met Giles' eye fiercely and without fear.

"That," said Biset, nodding at the silent shape of the Captain, "is a threat to all our lives. I was going to put her out of her misery." Biset looked down at the torn-off sleeve of an arbite shipsuit which half-covered the Captain's mouth and nose.

"I don't know that she's in any misery. Neither do you," said Giles, harshly. "In any case, it's not up to you—any of you—to do anything about it."

He looked around at the rest of them. They all but glared back. Even Mara's face was still and set.

"You, too?" he said to Mara.

"Me, too," she said, clearly. "I wouldn't have done it myself; but I can't stand in the way of people who want to live. This isn't Earth, Adelman. This is a lifeboat lost somewhere in space with humans on board it who didn't ask to be here, and who've got a right to live."

Her steady look accused him of the bomb he had set aboard the lifeboat—the bomb that had resulted in their all becoming castaways among the stars. For a second, grimly, he wondered what they would say if they knew that he had given his word to the Captain—a word he knew he would honor whether the Captain lived or not—to give himself up as the price of getting them all to 20B-40. But of course whatever reaction Mara and the others might have did not matter. He could no more tell them what he had done in an effort to buy their cooperation than he could break the word he had given. He was locked, lonely in the armor of his upbringing.

"Right or no right," he said, "no one, human or alien, is going to be killed aboard this lifeboat while I can stop it. Hem, carry the Captain to my cot in the front of the boat; and watch her from now on. If you have to leave her, call me. As for the rest of you—if I find her hurt or dead, the one who did it will lose their own juice ration. If I can't find out who did it, I promise you on my word as an Adelman that I'll take the juice she would have gotten, daily, and pour it out on the floor of the lifeboat!"

He paused, waiting for their reaction. But they were silent.

"All right," he said. "On the other hand, I know the strain you're all under. We need to work together, not fight each other. So I also give you my word as Adelman, that if we all—including the Captain—come through this alive to

20B-40, I'll buy up the indent contract on each one of you and make you a present of it. You'll all be free to build your own estate and pay for your children's education or spend your own earnings in making any life you want. That's a promise, not a bribe. I don't care what you do, as long as you keep yourselves alive and help to keep everyone else alive with you. You've got my word."

He turned and went back to the control section where Groce still sat. It was surprising that the other had not followed him back to see what the excitement was. Looking at Groce, Giles guessed that the shock of his own anger had left the little man too frightened to risk doing anything that would push the Adelman over the brink into some action that might destroy Groce completely.

"Back to work," said Giles, briefly, reseating himself in the empty command chair.

They returned to their task. One ship's day went by, then another . . . Groce dozed between the times Giles wanted him; but Giles kept himself going out of some well of inner determination he had not known he possessed. He was beyond knowing his inner feelings, now. He hardly knew if he slept or waked. But something kept him moving. Moving slower and slower all the time, but moving . . .

Somehow, they were at last at their goal. A final figure looked up at him from Groce's compute display.

"Is that it, then?" Groce was asking. "The correction factor we need?"

"It could be the correction factor for a course to hell, for all I know." Giles heard his own hoarse voice answering from someplace far off, as if someone else was speaking, distant at the end of a lightless tunnel. He reached out, slowly and carefully, and with fingers that wobbled like those of a drunken man, he punched the correction factor into the course change that was already set up on the lifeboat's control panel.

"Now . . ." he said, and thumbed the drive switch.

It was done. There was no sensation of movement or change of direction; but it was done. Clumsily, he got to his feet and stepped out past Groce, away from the control panel.

"You should get some sleep now," Mara said, coming up quietly behind him. She put her hand to his shoulder, steadying him as he tottered, and unconsciously he covered her fingers with his own hand. Her skin was soft and strangely cool to his touch.

"Yes," he said, still from a long ways off, "I guess I need it."

"I'm sorry"—her voice was low in his ear—"I hinted about . . . what you know about, when Biset tried to kill the Captain."

"That's all right," he said. "It doesn't matter . . ."

"It should," she said. She was guiding him to his cot. The long shape of the Captain lay still on Hem's. He was aware now of Hem standing beside it, watching him. Giles dropped heavily on his own cot and lay back.

". . .A little sleep . . ." he said. "Yes. Just a little . . ."

He went away then, off into the same lightlessness of the long distance where his voice had already preceded him, leaving ship, arbites and Albenareth Captain behind.

13

Thirty-fourth day—11:45 hours

It was the last fruit on the vine.

They were all watching as Giles plucked it and cradled it in his hands. It was full, plump, filled with juice, and it had remained on the vine until the absolute last moment. The juice container was about three-quarters full—about six days supply on half rations. They had come a long way to this moment when the final fruit was plucked, the last liquid extracted. After this?

Hem lifted the handle of the press carefully so Giles could place the fruit into the opening. Then the big arbite pressed down, over and over again, until the last drop had been pressed from the pulp and had dripped into the plastic container. It was a pitifully small amount. Giles removed the pulp and divided it into seven equal amounts.

"Eat it all, right away," he said. "There's still water in the pulp, so we'll skip today's juice ration. And from tomorrow on we'll go on half rations until all the juice we have is used up. This is the only way. We have to stretch what we have as long as possible, while there's still hope."

There were no arguments. They choked down the pulp, chewing it to extract every last drop of juice, licking the bowls dry afterward. Giles poured the juice from the last fruit carefully into the tank, then went to make his noon check of their course. He was doing it faster now. Once it had been set into the controls there was little else he could do for six hours. The stars in the screen seemed unchanged, changeless, and he fought hard against a feeling of black despair that threatened to overwhelm him. Mara came up, walking slowly as they all did now, her clothing hanging loose on her thin body. She pointed to the screen.

"Which one is it?" she said. "I don't mean 20B-40 itself. I know we can't see that. I mean 20B-40's sun."

He tapped a spot of light, no different in appearance than so many of the others.

"Shouldn't it be getting larger, or brighter?"

"No. Not until we've made our last warp shift. This screen is for

navigation only. In any case a star doesn't look any brighter until the last day or two of flight."

"But we *are* on the right course?" There was need for reassurance in her voice.

"I believe so," he said.

"If it is the right course—then how much longer will it be?"

"According to what the Captain told me, we could be there about ten days from now. But that would be on his course, under ideal conditions. I don't think we can expect that well of my navigation, even if it's right. It could be more than ten days."

"You're not very encouraging," she said, with a weak attempt at a smile.

"Sorry," he said, staring at the controls. He could think of nothing more to say.

The conversation died like most of them lately, ran down without any real point or ending. He dozed in the chair and when he opened his eyes she had left. The stars looked very, very cold.

.Forty-first day—12:00 hours

The last drop of juice dripped from the faucet into the bowl with a small plopping sound. The very last. There was nothing to be said, so they drank their rations in silence. The last.

There were no buds on the vine although they kept checking. There were no buds anywhere, and no sign of fruit at all. The *ib* vine seemed healthy enough, covered with a fine crop of glossy, flat leaves. They had tried chewing the leaves but it was useless since they were very dry and bitter and seemed to use more saliva than any amount of water they might supply.

Forty-second day . . . forty-third day . . . forty-fifth day . . . forty-sixth day . . .

". . . Do you still keep checking the course?" Mara whispered in a bitter voice. "You still keep trying?"

"Yes—have to . . ." Giles whispered back. He was in no better shape than the others. Thirst, he thought with dull-witted humor, was no respecter of class.

"We're going to die, I know that now. Di is in some kind of a coma, hasn't opened her eyes in a long time. I think she'll be the first to die. I don't want to die that way, just giving in. Will you kill me?"

"No. If anyone lives, we all live."

"You don't want to help me. You want me to suffer." For the first time her voice was petulant, as if she would have cried had there been tears to cry with.

He sat in his command chair. The others lay on the cots or the floor without energy or desire to move. Someone had turned the recorder on and no one had the strength to turn it off. A girl's reedy voice sang a repetitious song in which the word *love* seemed to be repeated an unusual number of

times. A drum beat a monotonous rhythm in the background and there was too much percussion. It would have been very annoying to Giles normally; now he was scarcely aware of it. His throat hurt, his eyes burned, his body felt completely desiccated, all desires and sensations fled before the overwhelming thirst. Perhaps Mara was right; this was not a good way to die. The singer shrilled, the percussion clanked and banged. The inner door of the spacelock opened.

Reality had become detached. Hallucination held him, supplied visions his eyes could not see, swung inward the door that opened on the spacelock and then into empty space, and supplied an image of a spindly-legged Albenareth in a spacesuit, removing the helmet.

When a voice behind him screeched, then howled again, he realized that the others were seeing this hallucination, too. Perhaps, after all, it was not an hallucination. Gasping, he pushed himself up on his elbows, climbed to his feet holding to the control panel for support, staring. The helmet came off to reveal the wrinkled, dark, seamed face of an Albenareth, staring at him.

"You did not answer the communications call," an alien voice buzzed in awkward Basic.

"Water . . ." rasped Giles, in a voice dry as sandpaper.

"I have none. It will be supplied. The communications—we called."

"Don't know where the comm controls are . . . *water*!"

"There is trouble with the *ib* vine?"

Giles dropped to his cot, laughing voicelessly, laughing uncontrollably, clutching his midriff and rocking back and forth under the incomprehension of the alien gaze. Water. Trouble with the *ib* vine! *Water!* All they wanted, *water!*

Something clanged heavily against the hull. It was the forty-sixth and last day.

14

"An incredible story, Adelman," murmured the manager of the 20B-40 Mining Complex. He was a small, pink man, a graduate arbite, obviously, who had risen to this position of authority. —And authority it was, Giles had to remind himself. Amos Barsey was the closest thing to a representative of Earth Government on the mining world. "May I top that drink for you?"

Giles smiled agreement and extended his tall glass, watching the dark, cold, local beer gurgle into it. A beautiful sight . . . His hand was tanned dark from the long ship's days under the ultraviolet of the lifeboat's overhead illumination—tanned, dark, scrawny as a bird's claw clutched around the beaded glass, by contrast with the healthily-fleshed fingers of Barsey.

"Thank you," said Giles. "Kind of you."

He drank, feeling the coolness run down his throat.

"It's still a shock," he said, almost dreamily, "to realize it's all over. My navigation was better than I'd hoped. Only, all the time the emergency communications unit was beaming for help in sub-warp, with none of us knowing it."

"It wouldn't have helped, you know," Barsey answered, "if you hadn't been able to bring the lifeboat close enough to our solar system so the local Albenareth here could pick up your signal."

Barsey chuckled unexpectedly.

"I've never seen the aliens that disturbed," he said. "They still can't believe you could manage to navigate the lifeboat, when their own Captain couldn't."

"It wasn't her fault," said Giles.

"No, I suppose not." Barsey cast an oblique look at Giles from under his plump brows and his tone became somewhat dry and distant. "A page missing . . . and all that. Another mystery. But I suppose the book could have gotten damaged when the spaceliner was destroyed."

"I suppose," said Giles.

"Yes . . ." Barsey swung his float-chair around in mid-air to pick up a slip from his desk. "There was another mystery. Nothing important, of course. That *ib* vine. The Albenareth thought it had been poisoned, but the spaceship repair station here doesn't have the facilities for chemical analysis. They sent a sample of the nutrient fluid over to our lab for analysis. Quite a list of organic compounds in the sludge—none of them anything we'd consider could hurt the plant. Of course, maybe their experts will be able to pick out something harmful. Oh . . . and there was just a trace of something else." His gaze flicked to meet Giles', flicked away again to a far corner of the room. "A human-type drug, filthy stuff called tonky. That could have done the job, our chemist thinks—if there was enough of it, or it was in the nutrient fluid long enough. No way of telling when the contamination occurred, of course—it could have been from any human passenger who used that lifeboat as a safe place to store his drug supply, on any of the spaceliner's last fifty trips. And no point in mentioning that to the Albenareth, as I told our chemist. Just cause bad feelings, I would think?"

His eyes met Giles'. The slip dangled from two of his fingers.

"No, I shouldn't think there's any point in mentioning it." He dropped the slip into the disposal slot of his desk top. "Merely confuse the issue, since our medical people didn't find any of your arbites with active signs of tonk-addiction when they were examined after they landed."

"No," murmured Giles, "I don't

believe you'd find any of them presently addicted."

"Yes," said Barsey. "Well, enough of that. There's another matter. You made quite a point of wanting our medics to return the shipsuit you wore. Here it is."

He reached back to the desk, opened a drawer and drew out the torn orange shape of Giles' shipsuit.

"Thank you," said Giles. He felt in the pockets of the suit. There were a few small possessions in them; but the extradition papers he had saved from the blazing spaceliner and guarded so long were not there.

"Something missing?" Barsey asked.

"Nothing that can't be done without," Giles said, flatly. It was true. The Justicar on 20B-40 who had signed the papers had also been the man who was to be Giles' Oca Front contact, once Giles arrived here. But he had memorized the name of the man. It was only necessary to contact him and either get a new set of papers, or be directed to the hiding place of Paul, so that Giles could take care of the assassination here on 20B-40. Killing Paul on 20B-40 meant certain capture and condemnation for Giles; but, he told himself now, if he were to back off from that now, it would have to be for a better reason than just not wanting to be caught. He had brought the arbites safely to planetfall without loss of a single life, so his good name as a *Steel* in that respect was clean. What happened now, provided it was for the good of the race, should make little difference to him, personally. And the deaths of those who had died in the flaming spaceliner were still a debt on his conscience, waiting to be discharged by the only thing that in decency could do so—an act that would preserve the future for the human race. One that possibly could even aid the future of the Albenareth, as well. The alien crew and officers who had died in the burning ship had died willingly; but still . . . Giles roused to hear the Manager speaking to him.

". . . This is a somewhat isolated and lonely world," the Manager was saying. "There are no Adelborn here, barring yourself, sir; and the fact that we have to depend on each other a good deal on these colony worlds has made us close—even close with the Albenareth who're similarly stationed here. You'll find"—Barsey coughed—"we think a little differently from those back on Earth, arbite and—forgive me—Adelborn, alike."

He checked himself.

"Well, well, I didn't mean to rattle on," he continued. "There's a ship calling here in two days, headed back for Earth. I understand you wanted passage on it?"

"That's right." Giles got to his feet. "I just have to look up an old friend. You'd know him, I suppose?

He's one of your Justicars—Olaf Undstead?"

"Olaf—I'm so sorry!" Barsey scrambled to his own feet, looking unhappy. "He died just last week. You say he was an old friend?"

"I'd come out here to see him," Giles said.

"What an unfortunate—but let me give you his address." Barsey scribbled on a slip with a stylus. "He had a sort of housekeeper-companion. A free man, former arbite. His name was Willo. Arne Willo."

He passed the slip to Giles, who took it automatically, a cold feeling settling in his chest.

"Yes, thanks . . ." said Giles automatically.

"Arne can tell you all about him," said Barsey. "If there's anything else I can do, come back and see me at once."

"Yes," said Giles. "Yes, I'll see you again before long . . ."

He turned and left. Outside the Mining Complex Headquarters, he took a two-man autocar to the address Barsey had given him.

He had expected to find the address within the domed structure of the Complex itself. The atmosphere of 20B-40 was breathable, but arctic in its temperatures for most of the year—though now, during its summer months at the latitude of the Complex, it resembled barren, snowless winter in some area of lava fields and shattered rock. But he discovered that in recent years dwellings had sprung up outside the giant dome of the Complex—either singly or in groups, under small domes of their own. He therefore found himself directed to an exit port where an attendant sealed him up in a thermal suit, transparent helmet included, and seated him at the controls of a rock-buggy—a simple electric-powered, three-wheel vehicle equipped with an autopilot compute that could be set for the address he wanted.

A second later he was outside the dome, bouncing over the rough rocky surface on the outside wheels of the buggy. The incredibly distant white dwarf sun of the mining world illuminated the landscape around him no more than the full moon might back on Earth, and with much the same eerie contrast of pale light and black shadow. Behind him the huge Complex dome was like some enormous crouching monster, that dwindled as he moved off from it.

The autopilot of the buggy drove it steadily toward its as-yet invisible destination. Under the dim light of the dwarf sun, the surface of 20B-40 was like a small, rocky platform surrounded by uncountable numbers of stars. It came to Giles, strangely, that after all his days of being lost in the tiny lifeboat, it was now, with his feet firmly on planetary surface, that the utter, incomprehensible depths were making their impact upon his feelings.

On the lifeboat the stars had been only points of light on a screen. Here they were naked and real, and seemingly almost close enough to touch.

Reality, in fact, enclosed him. Even through his thermal suit, it reached and cooled him like the touch of some wind that could freeze him to the bone if he dared to face it without coverings. In the thin light of the far daystar owning this lifeless world, his beliefs about the situation of men and Albenareth and all his own personal plans and duties shrank in his mind's eye to passing things; inconsequential, transient touches of warmth in a cold universe. Touches that would come and go, in any case, leaving no mark or sign of their having been.

In the end, said a deep, atavistic part of him, there's only survival. Nothing else counts. Nothing else matters.

No, said his stubborn, upper mind. There has to be meaning. Survival without a meaning to it is nothing.

Survival, said the deep-gut part of him, insisting.

Meaning, he said above.

Surviv—

He wrenched his mind away from the internal argument. The rock-buggy was approaching a dome which by its size should house more than one dwelling, but probably four at an outside limit. The buggy trundled forward as if it would smash itself against the blank-surfaced, back-curving outer wall. But half a dozen meters from it, the wall irised open and the buggy carried him inside, the iris closing after them.

Within, there was a small garage area large enough to hold three other rock-buggies like Giles', but empty at the moment. He parked his own buggy, got out and approached a door in a farther wall. There was an annunciator button inside it and he pushed it; but no one answered from within the house to ask who had come calling. He put his hand on the button latch, experimentally; and it gave, unlocked to his touch.

The door opened before him. He stepped through it into a lounge room, wide, white-ceilinged and filled with comfortable chairs—empty of people except for one large figure which rose at the sight of him. It was Hem, holding a laser pistol.

15

"Hem!" Giles snapped out the order, instinctively. "Don't point that thing at me! Put it down!"

Hem looked puzzled for a moment, then his face creased in contrition.

"Sorry, Honor, sir," he said. He stuck the pistol into the waistband of the gray work slacks he was wearing. Giles drew a deep breath.

"What are you doing here?" Giles demanded.

"I had to stay here," said Hem. He beamed. "To guard you."

"*Guard* me?" Giles felt a cold prickling beneath the back of his collar as sweat popped out there. He had been just about to order Hem to give him the laser. But if Hem had already been given other orders about the weapon, a direct command might not be wise. Giles altered his tactics. "What are you doing here anyway, Hem? Doesn't a man named Arne Willo live here?"

"Oh yes," said Hem, "but he had to go away for a few days."

Giles felt his temper begin to stir. He forced it down. It was not Hem's fault that the big arbite laborer was limited to simple answers to simple questions. There was something going on here; a part of it was the laser in Hem's possession, as dangerous a toy in those big hands as a live grenade would be in the grasp of a five-year-old child. It might be significant that Hem had put the weapon back into his waistband instead of laying it down out of easy reach as Giles had ordered. Or perhaps it had meant nothing at all. The situation called for a careful phrasing of questions.

"You're here all alone then, Hem?" Giles asked. Hem nodded. "They all went to make sure nobody was after you."

"Who're *they,* Hem?"

"You know, Honor, sir. Everybody. All of us on the boat."

"I see," said Giles. "You mean Mara and Biset, Groce, and the rest?"

Hem nodded again. He seemed to have forgotten the laser at his waist. Giles began to walk slowly toward the massive arbite. If he could get close enough to simply reach out and take the weapon from Hem . . .

"Are they coming back soon, Hem?" he asked as he moved. If he could keep Hem talking, the bumper would have no attention left over to focus on what else Giles might be trying to do.

Hem nodded. "Guess what, Honor, sir?" he said.

"Just a moment," said Giles, talking calmly and steadily as he continued to advance, "then I'll guess. First, I want to know how you knew I'd be coming here?"

"She knew," Hem said.

"She? You mean Mara?"

Hem shook his head.

"No. Not Mara. The split—Biset."

"So," Giles said. He was only a few casual steps from Hem, now. "It was Biset who knew I was coming out here. How did she know?"

Hem shook his head, looking puzzled.

"I don't know, Honor, sir," he said. "She didn't tell us. She just said we all had to come out here, because you'd be coming here, sooner or later. Then, when you came in, everybody had better go look and make sure nobody was

after you. So, when the light went on for the garage, everybody went out to see. Everybody but me."

Giles checked his forward movement, under an irresistible temptation to turn and see if anyone was behind him. If Biset and the others had just stepped outside the dome enclosing this building for a moment, they might be back inside even now. He risked a quick glance over his shoulder and around the room, but it was still empty and silent, except for Hem and himself.

"Guess what, though, Honor, sir?" Hem was asking again. Giles looked back to see the broad face before him literally glowing with excitement and happiness.

"What?" Giles asked, taking another step forward.

"I'm going home!" Hem almost shouted. "I'm going back to Earth."

"Going back?"

Surprise checked Giles' feet.

"Going back, you say?" he echoed slowly.

Hem nodded vigorously.

"I'm going to see Jase!" he said. "And I'm going to say to him, 'Jase, guess where I've been?' and Jase, he'll say, 'Where? They put you in some other barracks?' And I'll say, 'I was clear off Earth. I was out in a spaceship and in a lifeboat and on a whole different world. Look Jase,' I'll say, 'I brought you back a piece of that other world to show you!' See . . ."

Hem fumbled in his slacks pocket and came out with a small bit of igneous rock, obviously picked up somewhere outside the dome.

"And Jase'll say to me, 'Hey! Great you're back!' He'll say, 'I've been waiting for you to get back. That's why I didn't pick some other bumper for a beer-mate–' "

Giles' ears pricked up. Had that been a sound from somewhere in the structure? No, it must have been only his imagination. He turned back to Hem, who was still rehearsing the conversation he would have with Jase when the two were back together again.

"Just a minute, Hem," said Giles, taking advantage of the other's momentary pause to draw breath. "What makes you think you're going back to Earth?"

"She said I could," Hem answered, happily.

"She?"

"Biset," said Hem.

"Well, damn her guts!" said Giles, with a sudden spurt of anger. "Hem, listen to me. Biset doesn't have any control over where you're stationed. She can't arrange to have you shipped back to your barracks on Earth–"

"Oh yes, sir," said Hem, solemnly. "She's a split. Everybody knows a split can do anything."

"They do, do they?"

"Sure, Honor, sir. They can put you in jail and beat you and keep you there for the rest of your life. Or they can get you transferred any place you want if they like you

enough. They can even just kill you, and the judges and all say it's all right."

Giles stared at the big man.

"Hem," he asked, "who's been telling you all this nonsense? The World Police don't beat anyone. That sort of thing hasn't been allowed for a couple of hundred years."

"Oh yes, Honor, sir!" Hem was very earnest. "They don't beat Adelmen, but any arbite who gets in the wrong place or doesn't do what they tell him, they beat him at least a little. Even an office arbite. A couple of them beat our timekeeper once for letting half a dozen barracks-gangs of us into town one day when they didn't want any of us there. Of course, with office arbites, they usually just send them to jail or transfer them someplace bad."

"Now listen to me, Hem," said Giles, sternly. "You've been frightened by a lot of tall tales. You don't understand. For anyone in the police to get away with anything like that nowadays, nearly every other branch of social control—the courts, the records departments, everybody would have to be involved."

Hem looked unhappy.

"But they do it, Honor, sir!" he said. "And they can send you anywhere. She can send me back to Earth—Biset!"

Giles recognized a blank wall, and shifted his questioning.

"All right, Hem," he said. "We'll talk about that some other time. Tell me why Biset is going to help you get back. Can you tell me that?"

"Yes, sir," said Hem, cheerful again. "She said it'd be all because of you. Because I'd be helping her with you."

"Helping—" began Giles, then stopped. Hem, smiling, had obviously no understanding of what Biset had meant in saying what she had. There was no point in asking the question of him . . .

A faint sound behind him, as of a foot shuffling on some smooth surface, made the back of his neck chill abruptly. He spun about—and they were all there. Mara, Groce, Esteven, Di and Frenco—and Biset, like Hem, holding a laser pistol. But, unlike Hem, the policewoman was not holding hers casually.

"Don't move," Biset said. "Don't stir a muscle until I tell you to!"

Her laser was pointed directly at his chest. He stood still—and from behind some drapes at the further end of the room a seventh figure entered. A man, Adelborn, tall and erect, with a thin, handsome face but without the tan normally found on Adelborn features.

"Well, Paul," said Giles.

"Hello, Giles," said Paul Oca, halting beside Biset. "So you tracked me down here, after all?"

"But not for long," said Biset, almost with relish.

"No, not for long . . ." For a

second a frown shadowed Paul's face. "Of all the Adelborn in that glorified debating society I founded, Giles, I'd hoped that you'd be one to see the light. The time for change is here, and nothing can stop it. You remember Tennyson's *Morte d'Arthur?* 'The old order changeth, giving way to new . . .' "

"True enough," said Giles. "I believe it. The old order's about to change, Paul; but not necessarily the way you see it changing."

"Oh?" Paul Oca's dark brows raised.

"That's right," said Giles. "For one thing, it's never occurred to anyone to realize that the Albenareth are up against the same problem we are. Only the way they think of death is so alien to the way we think of it that nobody saw the parallel. But we and they can help each other—"

"Giles, Giles," Paul interrupted, shaking his head, "how long are you and the others going to cling to straws, in the hope of getting change without trauma? Change never comes easy. Face it. In this case the price of it is nothing less than amputation of the two useless and crippling elements in our society so that a true middle culture of the human race can take over."

"Amputation?" Giles stared narrowly at him.

Paul nodded at Hem, as someone might nod at a post, or an animal chained to a post. His voice deepened.

"As long as the Adelborn and the genetically suppressed arbites, like this one, still exist, change is blocked. But the human race can't endure that block any longer. We've got to cut loose at any price, and build a strong new management class out of the best of the arbites, in a culture that's wholly arbite—arbite alone."

"The *best* of the arbites?" Giles looked at him keenly. "Since when were you concerned only with the *best* among the arbites?"

Paul's aristocratic face became a shade paler.

"Don't chop words with me, Giles," he said. "Obviously some group has to remain in control while the middle culture is maturing."

"What group? And what do you mean by cutting loose at any price? You can't just line up all the Adelborn and work arbites and shoot them down!"

Paul's face did not change. It was like the ice-cold visage of some ancient Roman's marble bust in a winter-frozen garden. The silence that was his answer stretched out in the room.

"By God!" said Giles at last, on an in-drawn breath. "You actually are planning it! You're planning to kill millions of people—*millions*—to make this change take place!"

"It's something that has to be done, Giles," said Paul. "That's

why we couldn't let you find me. It'll take another six months to set up a world-wide, spontaneous purge of Adelborn and manual arbites alike—"

"Hey," said Hem. His unnaturally old, hoarse voice broke in on Paul's words. "You aren't going to hurt Jase? You aren't going to do that?"

Giles hardly heard Hem's words. He was staring wolfishly at Paul.

"Who's 'we', Paul?" he asked.

"Listen, Biset," Hem was saying, looking at the policewoman, "listen, you don't have to send me back to Earth. Just don't hurt Jase—"

Biset laughed.

"You didn't think it was for your sake you were going back to Earth, did you, bumper?" she said. "No, it's for our sake—because you can be useful that way."

"That way?" echoed Hem, bewildered.

"This way," said Biset.

Calmly, she pointed the laser pistol in her hand and pressed the firing button. The pale sighting beam that guided the laser thrust seemed barely to touch Hem's broad chest, but his knees sagged. Slowly he fell, and Biset shot him again in the chest as he was going down.

He had fallen forward. He rolled painfully on to his side to look up at Biset.

"It hurts . . ." he said. "Why—"

There were no more words in him. His eyelids fluttered for a second, then closed; and he lay without moving.

"Why?" Biset told his corpse. "To make sure anybody coming after your high and mighty Adelborn friend here runs up against a dead end."

She turned to face Giles with the laser still in her hand. Suddenly realizing she was about to shoot him also, Giles half crouched to spring. But before he could leap at her, a shocking coldness lanced through his left shoulder and his knees went weak without warning. He caught at the back of a chair and kept himself from falling. Through blurred vision he saw Mara wrenching the weapon from Biset's grasp. Then his vision cleared and he saw Mara clearly, holding the laser, half-pointed at Biset.

"You idiot!" she was raging at the policewoman. "Didn't I say I had to be the one to shoot him? The wound needed to be placed just right anatomically if he's to live until he's safely away from here. Now you've complicated things!"

Biset's teeth drew back from her lips.

"Don't give me orders! You and your handful of Black Thursday fanatics aren't running things. It's the Association that's been preparing for this day for two hundred years—and it's only the Association that's got the size and power to take over, when the change comes. I don't do what *you* say, you

bumper's-get; you do what *I* say!"

Giles still held to the back of the chair, although he was already beginning to throw off the effects of the shot. Lasers could be lethal when one of their beams hit a vulnerable spot in the human body; but in a non-vulnerable area they made a particularly clean, self-cauterizing wound that—except for the heat shock when the beam first struck flesh—did less overall damage to the body than many earlier weapons had done. It was a little like being run clear through by a very thin sword-blade at forge heat. Biset's shot—as far as Giles could guess—had struck high on his shoulder and had gone through flesh and muscle without touching a bone or an important blood vessel. He had been lucky. But it might pay not to act as recovered as he was, just at the moment.

"Association?" Giles said, gazing from his chair at Biset. "What Association?"

Biset laughed at him.

"Fool!" she said. "Overeducated fool! Do you think world-wide revolutions are made by a few philosophers like yourself and your friend there"—she nodded at Paul—"or even by half a hundred like her Black Thursdayites who solemnly go out to get themselves shot down, to provide martyrs for the cause?" She turned to glare at Mara. "They couldn't even do that by themselves!" she spat. "We of the Association had to have the proper men in police uniform, ready and briefed to make sure they were all killed on the spot, neat and tidy—otherwise the whole thing would have come apart."

"All right," Giles said, "Tell me. This Association—what is it?"

"What is it?" Biset said, turning on him. "What do you think it is? An *Association,* a network, of all the Arbites who did the real work under your so-called Adelborn. Police, administrative, production and service personnel of high rank like myself—" She interrupted her own tirade. "Did you think I was just an ordinary policewoman? I'm Deputy-chief of the Investigative Arm, Northeast European Sector. It's me, and a few thousands like me—but thousands controlling thousands apiece—who're the Association, the *real* arbite Underground that set out to get rid of you Adelborn almost from the first day you were in power." She turned her back to speak pointedly to Mara. "Get busy," she said. "Shoot him—your way. Let's get things moving—"

"Just a minute," said Giles. He spoke out of pure instinct, to play for time that seemed to be running out. His head was whirling with what he had just learned; and certain conclusions of his own that developed inescapably from it. He groped for words that would annoy Biset enough to keep her talking.

"So," he said to the arbite woman, "you aren't a convert of Paul's after all. I thought you'd come to believe in him—"

Biset took the bait.

"Believe?" She almost spat the words. "In *him*?" The last word was expelled from her lips as if it had been a poisonous toad. "These other fools may believe in daydreams. I belong to the people who've made things happen—from the beginning when your kind took over! Do you think I'd listen to people like him—or her? It's not a simple job to get rid of millions of people over the face of an entire planet in twelve hours. We need those six more months of quiet—perfect quiet, while things are set up—so that no Adelborn gets curious or alarmed. And *this* fool"—she threw a glance at Paul—"had to go and let your amateur Oca Front sleuths track him down here to 20B-40, in spite of all we could do in the World Police to cover up for him. Whether you killed him or brought him back, there'd be no way to hush up the fact he'd come

this far and been given asylum by the aliens and humans here. *That* had to trigger off an investigation by Adelborn in the Police ranks, and our own plans for a tidy elimination would have been turned up, too."

She stopped talking abruptly. Giles spoke quickly.

"So you knew I was headed for 20B-40?" he said. Then he shook his head. "No, of course, you couldn't have known—"

"Couldn't?" flared Biset. "Of course we knew. I came on board for the trip particularly to take care of you. I brought these—she flung her hand out at the other arbites in the room with a sweeping motion, "as a team to help me. A team pulled from the lower ranks of the Association, a team that knew nothing but how to obey their orders . . ."

She paused to look at Mara.

"All but this one. This one, I was forced to take to keep the goodwill of the Black Thursday idiots!"

"That's very interesting," said Giles—and he meant it. "Then just tell me one thing—"

But Biset was through being conned into conversation.

"I'll tell you nothing," she said, turning to Mara. "All right, girl, you've got the weapon. Shoot him, and let's get going!"

Mara lifted the gun. Its slim barrel became a tiny ring with a black dot in its center facing Giles. Beyond that ring, Giles could have sworn he saw something that did not match the pointed weapon in Mara's face—something that begged him to understand.

Then there was a little wink of light from the black dot at the center of the metal circle—and darkness came instantly.

He woke—if it could be called that, because it was a sick and uncertain return to consciousness—and found himself in some small, dimly-lighted space with darkness surrounding it. Mara's face was a few inches in front of his own. He was able to recognize it quite clearly, although it went in and out of focus as he watched. He became aware that her hands were doing things to his body; strapping him in, in fact, to the seat of a vehicle—a seat of the rock-buggy that had brought him out here.

"What're you doing?" he tried to ask, but the first word that came out was more like a blurred grunt than anything else.

"Hush . . ." her voice barely breathed in his ear as she worked with her face close to his. "Save your strength. Don't talk. Listen . . . there wasn't any choice. I *had* to shoot you a second time. They think I placed the burn so that you'll die in about fifteen minutes, well before the buggy brings you back on automatic controls to the main Complex. But I didn't angle the shot the way they think. If you can get to a doctor in the next

couple of hours, you'll be all right. You must live. You must . . ." Her lips brushed his cheek faintly as she tightened the strap around his shoulder and chest. "It's all I can do. I'm almost as much in Biset's hands as you are. But remember . . . don't do anything until the buggy gets you to the Complex. Then punch the control keys for the nearest hospital. Don't waste time trying to reach the local police . . . you understand?"

"Yes," he said . . . or thought he said. But evidently she understood. Her head nodded slightly and her face moved away from him, out of his field of vision.

He found himself staring through the windshield of the rock-buggy, directly at the closed metal doors he had entered earlier, now glinting metallically in the buggy's headlights. After a moment, the doors parted and the buggy jerked into movement. It rolled forward, out of the doors and onto the rocky, lunar-like landscape of 20B-40.

The distant white-dwarf sun was high in the sky now; and the jumbled rocky plain before the windshield of the moving buggy was a panorama in black and silver, in which the headlights of the buggy paled almost to invisibility. Over everything rose the dome of the night and the stars, with all other habitations, including the main dome of the Complex, invisible in the further darkness distant, around the horizon. The buggy jolted and swayed as it went, in spite of its excellent suspension, crossing the boulder-studded and uneven ground.

The jolting intruded a slight nausea into the aura of dullness and discomfort that encased Giles like a bottle. He was not conscious of any specific pain; but a sort of general uncomfortableness seemed to have soaked all through him, even into the marrow of his bones. He was dull-minded, weak and heavy.

It required a great effort, but he finally forced his mind to think about where he was and what was happening to him. The effort itself woke him slightly, perhaps pumping a little adrenalin into his bloodstream. He became more aware; but at the same time his discomfort sharpened. He was conscious of two overlapping areas of heavy pain-like-pressure, as if a large bruise was being pressed on by some intolerably heavy weight. One of the areas involved his left shoulder and the other was just above his breastbone. It had been in the shoulder that Biset had shot him, he remembered muzzily. The pain over the breastbone must be where Mara had burned him a second time with the laser.

The *why* of all these things nagged at his dulled mind. Why go to all the trouble of shooting him and then sending him back to the central Complex in his rock-buggy?

He made an effort to sit up, to see what, if anything, had been

done to the rock-buggy itself—and his right foot caught against something on the floor at his feet. With a second great effort, he pulled himself up to look down at it. The body of Hem lay there, as if it had tumbled from the seat beside him; and the laser handgun was still tucked in the waistband of the gray slacks.

Every movement was like lifting some great weight; but movement was possible. Slowly, in several successive, jerky efforts, Giles managed to bend forward, reach down and pick up the weapon. He curled his finger around the trigger button and pointed it at the surface of the buggy seat beside him. He pressed the button.

Nothing happened. The weapon's charge was either exhausted, or removed. Effortfully, he shoved the useless, but still dangerous-looking weapon inside his jacket and leaned heavily against the backrest of his seat.

He felt exhaustion imprisoning him like soft but massive fetters. The buggy jolted onward, headed toward the main Complex dome, still invisible on the night horizon.

He passed out a second time . . .

16

He came to suddenly, choking on the bitter taste of bile in his throat.

He had been sick . . . or rather his body had tried to be sick, but found nothing in his stomach except digestive juices to expel. The raw, searing throat-and-mouth-burn of the internal acids had brought him back to himself again.

He felt clearer-headed now. He was aware of his body in a more normal sense; and the pressure areas were beginning to send signals along his nerves in more normal fashion—not yet as sharp pain, but rather as deep-seated aches. Under the acid taste lingering in his throat, he was conscious of a raging thirst, and his eyes burned and gritted as if he had been staring into dust-filled air, unblinkingly, for some time. Beyond this, however, his mind was newly alert, with the abnormal alertness of someone under a high fever. He looked down at his feet and saw the body of Hem, still there. He looked ahead through the windshield of the moving buggy and saw the tall black semicircle of the main Complex dome, now partially occulting the stars ahead.

Feverishly, with a rush, the whole plan of Biset and her underground arbites tumbled into understanding before him. Barsey knew he had set forth to visit the caretaker of a dead friend's dwelling. Now Giles would be on record as returning with one of the arbites who had shared his shipwreck—and that arbite shot to death; while he had two burns through him and an empty weapon at hand. Plainly, from what Mara had said, he had been intended by Biset to be a corpse like Hem by the time the

buggy rolled automatically into its stall at the main Complex.

That meant an investigation by the World Police—the only ones competent to investigate in a case where an Adelman was suspected of something illegal. Biset herself, as a fellow-survivor of the lifeboat journey, would be automatically disqualified from investigating. That meant an investigator must be applied for from Earth, must make the trip out and spend days or weeks—weeks, undoubtedly, thought Giles, if the World Police were as infiltrated with Biset's arbite Underground Association members as the policewoman had claimed. Whoever was sent out would almost certainly be a member of that Association and would spin out the investigation as long as the Association needed or wanted it spun out.

That would give the Underground the six months Paul and Biset had mentioned, or as much time as it needed to prepare for the wholesale slaughter of the Adelborn and the work-arbites.

Giles made himself move. He managed to reach out and switch on the voice control to the autopilot of the rock buggy.

"Change destination," he croaked at it, as the small white light on the panel before him lit up. "Go to . . . the place where the Albenareth are. The alien area in the main Complex. I want to locate an Albenareth Captain . . ."

For a moment he doubted that his words had conveyed any clear and adequate order to the autopilot. But then, abruptly, the vehicle altered direction. Giles fell back in his seat, panting. There was nothing to do now but wait—and hope that this new destination he had ordered was not too far away in terms of time.

The buggy rocked and jolted along. After a while, he was able to see that they were close to the high metal wall that was the base of the main Complex dome, and running along parallel to it. They would be headed toward a different entrance from the one at which they had originally emerged. After some fifteen minutes, Giles saw such an entrance approaching. But the doors of it did not dilate as they got close, and his buggy went on by. He lapsed into a state that was half doze, half actual unconsciousness . . .

The buggy stopped with a jerk.

He roused himself and looked around. He was already inside the dome, in a parking area. Some twenty meters from him was a building that seemed to grow out of the dome itself; and in a wall of the building facing him was a transparent section beyond which the head of an Albenareth looked at him. The thin mouth moved, as if speaking.

Belatedly, Giles punched on his intercom.

"—repeat, your business here?"

the alien voice was asking in the human tongue. "You have arrived and flashed a recognition signal; but you have not answered my question. What do you want?"

"Sorry . . ." said Giles thickly. "Intercom off. Sorry. I want to . . . I want to meet with the Captain Rayumung again."

"Which Captain Rayumung? We have a number of individuals here of that rank and honor."

"The . . . Captain Rayumung who lost her ship in an explosion . . . who came to this world in a lifeboat with a number of humans, of which I . . . am one. I am an Adelman, of *Steel.* She'll know me. Will you call her?"

There was a small pause before the voice spoke again.

"I identify the individual you refer to. She is now Rayumung past-Captain. I will try to locate her. Will you come inside?"

Giles started to move without thinking, and found the strength was not in him.

"I . . . have to wait out here for her. I'm sorry. Tell her . . . so. I apologize . . . ask if she'll come here to me. But hurry . . ."

"All dispatch is always made."

The state of doze-unconsciousness moved back in on Giles as the intercom fell silent. He roused again to the sound of a tapping on the transparent pane to his right, against which his head had been resting.

He straightened up, turned, and looked. An Albenarthian face was staring in at him from just beyond the transparency. Was Hem visible to it, in the shadows at his feet? With a surge of alarm, he fumbled with the latch of the door below the transparency. It opened, and he half fell, half stepped out to face the alien figure beyond.

"Captain Rayumung?" he managed, in Albenareth.

The dark eyes looked down into his.

"I am a past-Captain now," said an alien voice in human speech. "But I know you, Adelman. What do you want with me?"

Giles leaned back against the body of the rock buggy to keep from falling. His knees were treacherously weak. They would start to shake visibly in a minute. He tried to go on speaking in Albenareth but the effort was too great.

"I promised you something," he said in his own language. "I promised to tell you who set the bomb that destroyed your ship."

The alien face watched him. The alien voice buzzed its human words.

"That no longer matters. After further consideration I have given up the life I carried. It will be matured and borne by another. So, all connections are broken, and it no longer matters how my ship died."

"Doesn't matter . . ." He stared at her, sick with the weakness from his wounds, unable to think how to

deal with this new defeat. "You gave up your . . . why?"

"I had no honor of achievement to pass on. It was you who piloted your humans to safety. Dishonor canceled is no shame, but neither is it of any assistance. It would be good to find and bring justice upon whoever killed my shipmates and my vessel, but it is nothing to do with the life I conceived. I have given that away. Only for the prospect of achieved honor would there be reason in keeping the relationship with my child that is now parted; and where is there any such prospect? For a ship and all who served it are lost; and that is a thing which nothing can change."

"But . . ." said Giles, "If that loss could still lead to some great good for the Albenareth—all the Albenareth—what then?"

"Great good?" The dark eyes watched Giles' face closely. "For all our holy race?"

"Yes," said Giles.

"How could that be? And how could you, being only human, know what would be a great good for the Albenareth?"

"Because in this case it's involved with what has to be great good for humans."

"There can be," said the Captain, "no such involvement. In no way are we alike, human."

"Are you sure?" Giles asked. His legs were close to the end of their strength. Imperceptibly, he began to slide down the side of the rock-buggy. The Captain stood silent. "You lived with me—and the other humans—all those days on the lifeboat. Are you still so sure that we aren't alike, so sure there's no chance we could have anything in common?"

The tall figure before him blurred.

"Perhaps . . ." said the Captain's voice. Suddenly, two casually powerful hands caught Giles by the shoulders and lifted him, held him up, pressing him against the side of the buggy. "Are you ill?"

"A little . . . hurt," said Giles.

He moved his lips to say more, but there was no strength in him to form words. Dimly, he was aware of the head of the Captain bending forward as she looked past him, into the buggy. This close, she could not miss seeing the body of Hem.

Giles waited for her demands for an explanation, for the alarm that she would now surely give. But nothing of the sort happened. Instead, he felt himself held aside as the door of the buggy was opened, then lifted in, with the body of the Captain hiding the assistance she gave him from the transparent panel where the other member of her race still sat watching.

He was thrust into his seat and the seat clamps folded in automatically to hold him there. The door of the buggy closed—a second later the door on the buggy's other side opened and the tall shape of the

Captain moved in to take the seat beside him. She reached for the controls, the buggy moved, pivoted and drove out through the door in the dome shell where he had entered.

She headed the buggy directly outward from the dome. After a moment, she spoke.

"I am a past-Captain," she said. "And I will die now as planetbound as if I had never known space; nor will there be shipmates who remember me. But there is something here that is unfinished. You defied me to save the least of your slave humans, and here with you is one who is dead and you are clearly more than a little hurt. Also you asked me if perhaps there was not something in common between human and Albernareth after all; and that question troubles me. Before our time on the lifeboat I would have had no hesitation in rejecting such an idea. Now, I do not know . . ."

Her voice died in uncharacteristic fashion. He lay there, letting his body give to the jolts of the rock buggy.

"Can you speak?" she asked, after a moment.

"Yes," she said. The word came out as a barely audible whisper. He made an effort and strengthened the effort he put into his voice so that it sounded more clearly. "I understand a lot now that I didn't before . . . the Albenareth don't just seek death, any more than we do. Death is only a way-station to something bigger . . . to a racial Oneness with the universe."

"Of course," said the Captain.

"No . . . not 'of course' " he said. "You don't understand how hard a concept that is for humans to understand. Death for us is personal and unique—either the end of everything or the freeing of something called a 'soul' that ends up making its own individual terms of unity with the universe."

"The race lives," she said. "The individual is only one of its parts."

"For you Albenareth—not for us. That's the difference," he said. "We think of ourselves always as individuals. 'When I die,' one of us will say, the world ends.' You Albenareth can't really appreciate that way of thinking; any more than we can really appreciate your Portal and your Way."

"Then there is nothing in common, after all."

"Yes, there is," Giles said. "A common lack. Both of our racial philosophies were adequate while each of our races lived only and entirely on the world of its birth. But now we've both gone into space and it's not enough for you just to translate the Portal and the Way from single-world to universal terms. That way lies stasis and physical death for your race. Likewise, for we humans it's not enough for us to say merely, 'When I die, the universe ends.' Because now we've seen the universe, and

now we know it's too big to vanish just because one individual has died. As individuals we face a universe too big for us."

"A common lack binds nothing."

"But the fact we can help each other, binds something—in both our cases," said Giles. The feverish feeling he had experienced earlier had come back on him again; and he was finding a strength to argue that he had not known he had. "What we humans lack can be found in part of what your race already has in its philosophy—an anchor-point in the idea that the race survives. As individuals we're too small to face up to the universe, but as a race we can. That is what our philosophy needs. And what you Albenareth lack is the part we have—the individual's refusal to give in to a situation where all race teaching says that survival is an impossibility. Remember, *you* gave up; but I brought the lifeboat in, after all."

His words echoed and died in the small capsule of the rock-buggy, in the face of the unearthly black and silver of the barren nightscape outside the vehicle's windows. He turned his head to stare at the motionless, round, non-human head of his companion, waiting for her reaction. What it would be, he had no way of telling. In human terms he had reminded her most cruelly of her failure in that function of which she had been most proud.

"It is true," the Captain said at last, slowly. "And it is that which has remained unfinished in my mind. You did what you could not possibly do."

"Because I had no choice," he said. "I *had* to get to 20B-40—even if the universe, even if all the Albenareth and all other humans were opposed, or thought it impossible."

The Captain turned her head slowly to look at him.

"But what you describe is anarchy," she said. "No race can live if its individuals are like that."

"Ours does. We live. And here we are—with you Albenareth—in space."

She looked back away from him, out through the windshield at the rocky land.

"Even if you are right," she said, "how could we help each other, your people and mine?"

"I want your aid," Giles said, "to save a human from other humans who would use him as an excuse to destroy many other human lives, millions of lives in fact. Together we can take him from them, and their excuse as well; as together we brought the lifeboat safely to this world. Because, even though you were not able to navigate the boat the last stage of the way, up until that point where I took over, I in my turn would have been unable to navigate. Until then, I hadn't lived through the necessary days aboard that small vessel that were

to teach me about your race and mine, and bring me to know how much of what I used to believe was wrong."

"But even if we do something together, what will it prove?"

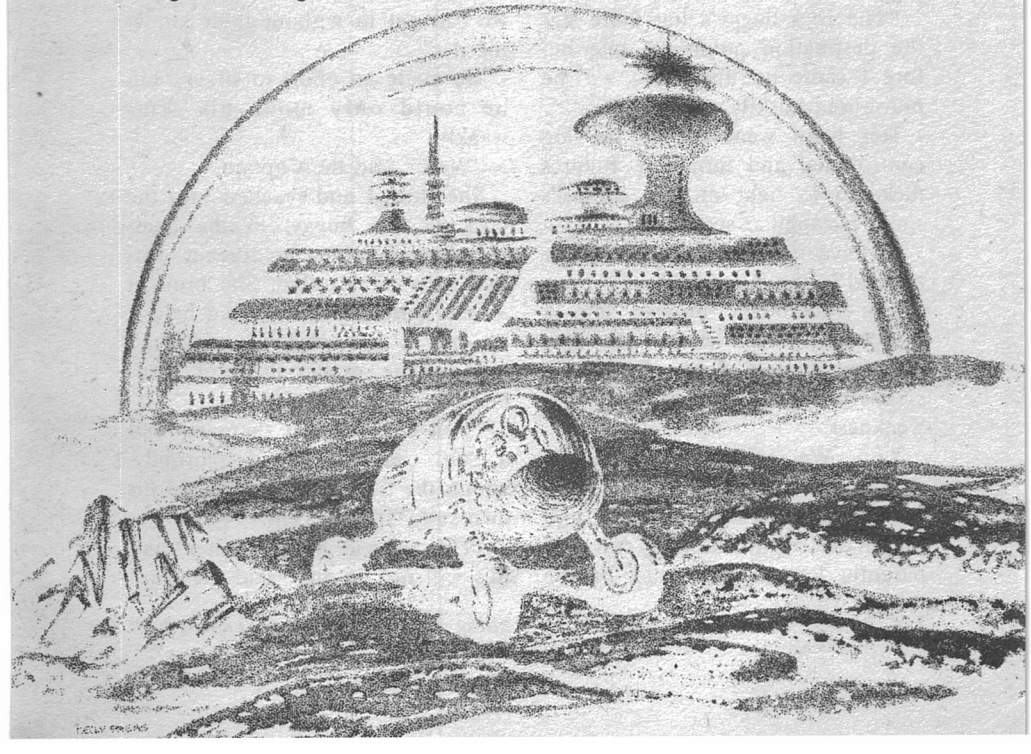
"It'll prove we can supply each other's lack," said Giles. "It can prove we're capable of small things together neither of us could manage alone. To save the lives of some few humans and one Captain Rayumung is not a highly noticeable thing. But to save the lives of many humans—and because of that potentially to save many lives of the Albenareth, setting them free to follow the Way with new understanding and cooperation with my race—that would be a noticeable thing, something to convince both your race and mine that we both need to learn to think differently and work together, in space and on the planets—not just in our own separate spheres. And the benefits from creating that conviction could win great honor for you and your child."

She moved a little in her seat—restlessly, he thought.

"What you talk about," she answered, "goes beyond my personal honor. You ask something unusual from me."

"I know," he said. "If there is a word for it in Albenareth, I have never learned it. But in human speech the word is *friendship.*"

" 'Friendship'," she echoed. "It is



a strange word, if it is based on no kinship, no duty-association or logical cause for cooperation."

"It is based on mutual respect and liking," Giles said. "Is that enough? Or not?"

He sat, waiting for her to answer. She turned her face to him again. As always, her eyes and tone of voice were unreadable.

"This is all new to me," she said at last. "It is true I have noticed that among your people and mine on this world of 20B-40 . . . well, in any case what you say is enough for this moment." She broke off abruptly. "Where do you want us to go, then?"

The feverish strength drained suddenly from Giles, and he sagged in his seat.

"The rock-buggy's log there has the destination point—the one before I came hunting you . . ." he murmured huskily.

Her hand went out to the log control dial and turned it. Figures flickered to light on the control's small rectangular screen.

"I have it," she said. "It is now entered in the autopilot."

The rock-buggy lurched into a right turn. Giles closed his eyes and let himself float off on the slightly nauseating tide of his weakness.

". . . We are here," announced the voice of the Captain.

He opened his eyes again and found the buggy standing still, apparently lost in the midst of the white dwarf-lit plain. Then, slowly, his eyes recognized, ahead through the windshield, the shape of a single-dwelling dome.

"Good," he muttered. "You stopped outside it."

"We had talked of what to do only this far," said the Captain. "You want us to go inside, now?"

"Yes," said Giles. He was coming awake again, drawing on himself once more for the feverish strength that had so far been there for him when he needed it. At the same time, he felt the deep extent of the weakness and pain that was with him now—like a tight metal band enclosing all his upper body.

"Yes," he said again. "But we mustn't drive in. There'll be a foot entrance somewhere, and maybe we can get in without their knowing it—"

He made an effort to sit up; but he could only move his arms weakly.

"Wait," said the Captain.

She turned and reached into the back of the buggy, to the compartment in which emergency outside suits were stored. She brought a limp garment forward and held it up—but it was obviously designed only for the smaller shape of a human.

"You can't go out there without a suit," said Giles, despairingly, within the transparent helmet of his own suit. "It's too cold."

"This vehicle has no other, and this will not fit me," said the Cap-

tain indifferently. "It is a short distance and no matter."

She got out, walked around to Giles' side of the vehicle and opened the door there. Picking Giles up in her arms, she began to walk with him toward the dome. Breath plumed from her lips and almost at once icicles began to form about her mouth and nose-slits. But her arms seemed to hold the weight of Giles' body without effort, and she paced calmly and regularly across the rocky, broken ground.

When she came to the dome, she circled it; and at about eighty degrees from the large doors that had admitted Giles' buggy before, they found a small, individual entrance with a latch button beside it glowing with its own internal dim red light to show that it was unlocked. The Captain pressed the button without putting Giles down, and the door slid aside. She carried Giles inside and the door closed again behind her as a light went on to show them a small entry-room, and a farther door.

"Can you walk now?" the Captain asked.

Giles shook his head.

"It does not matter," she said. "I will continue, then."

She went forward to the farther door, opened it, and mounted a short ramp into the carpeted interior of the house. The sound of voices came to them from along a corridor to their right; and the Captain, turning, carried Giles in that direction until they stepped through the light-curtain obscuring an entrance to find themselves once more in the lounge room Giles had visited earlier.

She stopped. A reflecting wall across the room gave back her image and Giles'. Inside his suit, he looked pale and ordinary; but the Captain glittered black and silver like the landscape outside, for the fur covering her body was beaded now with tiny crystals of ice where the warm, moist interior air had frozen on contact with her chilled body.

She stepped to a nearby floatchair that was empty and lowered Giles into it, then unsealed his helmet and removed it. She straightened up again, turning to the people in the lounge who had been staring at her all this time in silence.

"I bring you the Adelman you know," she said. "He has things he wishes to do—and with my help. But before I help him I want to see among you, or between you and him, this thing he calls 'friendship'; which surely all you humans must understand since it is a word of your own language."

17

Seated helpless in the chair, Giles cursed himself. He had made the most basic mistake possible, he told himself, anthropomorphism. Carried away by his own emotion,

he had forgotten that under no circumstances could the Captain have the same human referents for the concept of 'friendship' as Giles, who had tried to bring her to share it with him. What had made him think he could so simply put himself in the mental shoes of a being that was product of an alien physiology, an alien culture?

Biset, Esteven, Groce, Di, Frenco, and even Mara, stood silent, staring back at him and the Captain, still clustered around the chair in which Paul Oca now sat. But Paul was tied in the chair now, and a thin line of blood had run down from one corner of his mouth. Plainly, Paul had proved recalcitrant in some way; and Biset had turned against him. Perhaps there was hope. Paul had been the closest thing he had ever had to a friend. Perhaps Paul would acknowledge friendship for Giles now and satisfy the Captain. Without the help of the Albenareth, neither he nor Paul had any reason for optimism; and Paul must know that.

"Paul," Giles said swiftly to the other man, "the Captain Rayumung listened to me when I said there was such a thing as friendship. But she only has my word for it. You and I were friends once, Paul. You'll back me up, won't you?"

He threw all the emphasis possible into the last few words, so that Paul should understand the unspoken message. *Back me up and live—don't, and we're both out of luck.*

Paul stared back at him.

"I—" Paul began; and then his face and body stiffened. Something came into his face that Giles had not seen there for years.

"No," said Paul, clearly. "Whatever's to be gained by my agreeing with you, Giles—the answer's no. I've never lied, and I won't lie now. We grew up together; but we were never friends. I had no friends, any more than you did. No true Adelborn feels friendship; only his duty, as he sees it."

His eyes met Giles', without apology. Giles shook his head feebly. With his momentary hope falling in ruins around him, he could not bring himself to blame the other man. Paul Oca, in the end, had answered with the only words his upbringing had left him to say, the sort of words Giles himself had once been ready to live and die by.

"All right," he said. "But if that's all there is to it, Paul, I'm no true Adelborn any longer. Since that lifeboat trip I've felt a lot of things that went beyond my duty as I saw it."

He looked at the arbites standing about the chair where Paul sat tied.

"Even with all of you," he said to them. "In the beginning, all I wanted was to come to 20B-40 to find Paul, because that was my duty. I started out in the lifeboat determined to keep you all alive

because *that* was also my duty—what one of *Steel* should do. But during the trip, I got to know you. I got to like you, all of you, just as persons; in spite of everything each one of you did that disappointed me, jarred on me, or rubbed my temper thin. You aren't angels. No humans ever are. You aren't even Adelborn. But you're the people I lived and nearly died with and you've come to mean something to me now. You—and all the arbites like you, back on Earth."

He gazed at them, a little sadly.

"Doesn't even one of you know what I'm talking about?" he said. "Isn't there one of you that felt it, too—that something I'm talking about?"

Mara broke suddenly from the group and ran to him.

"Get her back here!" snarled Biset. "Esteven, Groce—drag her back here!"

The two men hesitated, turning to stare at each other.

"Go on!" blazed Biset. "Do what I tell you!"

The men turned away from each other. Together they went forward to where Giles sat. But when they reached the chair, they did not touch Mara, who was now standing behind it with her arms around Giles. Instead they turned, one on each side of Mara, and stood facing Biset.

"What's the matter, you idiots?" raged Biset. "Bring her back here!"

"No," said Esteven.

The entertaincom's face was pale, and sweat was rolling down it. But his lips were tight together.

"You don't own me!" Esteven said to Biset. "If it was up to you I'd be crazy or dead, from the tonk. He saved me from the Captain. He saved me from the stuff! Why should I do what you want?"

"That's right," said Groce, hoarsely. "You don't own us."

"Don't own you—why, you bumper-gets—" Biset broke off, for the others who had been standing beside her were now in motion, crossing over to join Mara, Esteven and Groce beside Giles. *"Come back here, all of you!"*

Di, alone, hesitated at the sound of the policewoman's voice. But Frenco caught her hand and pulled her along with him. They reached Giles and turned to face Biset.

"No one owns us," said Esteven. "It's different out here on the colony worlds. You can't have us beaten up or judged criminals and put to forced labor here, just because you want to. Here, you've got to prove we've done something wrong."

"You think so," said Biset, grimly.

She reached into a pocket of her suit and came out with her laser handweapon.

"I can kill you all," she said, harshly, "and claim you're a Black Thursday group. I may be held under house-arrest until an investigator comes from the World Police

on Earth to check the matter; but when the investigator comes, I'll be cleared—by whomever they send. Think of that as you're lying in your graves—"

But she had been concentrating too wholly on these who defied her. The Captain was suddenly in motion, moving toward her with great strides. She jerked the laser weapon about to aim it at point-blank range at the towering figure.

"Get back!" she shouted. "I'll kill you, too, if I have to—"

But the Captain came on. At this range Biset could not miss. Desperately, Giles reached into his jacket, snatched out the empty laser he had found in the rock-buggy and pointed it at her.

"Biset!" he cried.

She glanced at him for a moment, saw the laser and pulled her own weapon about to shoot him before turning its beam on the Captain. But time was too short for both actions. Giles saw the wink of light at the end of the barrel of Biset's weapon, heard Groce grunt and clap a hand to a burned forearm, then the tall dark figure of the Captain closed with the slighter human shape before him; and Biset went down . . .

Giles blinked about him, slumping in his chair. A wave of weakness and dizziness had threatened to carry him off. Now it was clearing, but his eyes were still playing tricks on him. He was seeing double—no, triple—images of the Captain. He blinked and stared again, but they remained. The room was full of Albenareth; and there were other humans there which had not been present a moment or two before. One of them was Amos Barsey, now supervising the release of Paul Oca from his bonds by a couple of men with police armbands—clearly members of the local 20B-40 constabulary.

Freed and on his feet, Paul was led out of the room. As he went, he paused by the chair where Giles still sat.

"Remember today, Giles," he said, coldly. "Today you've kept the human race from saving itself and put it on the same road to eventual death that these Albenareth are already on."

"Or perhaps on a new road for both races that's the road to life," answered Giles. "We'll have to wait and see, won't we, Paul? But I'm betting my way's the right one."

Paul turned without a word and let himself be escorted off. Two men carried out the body of Biset; and the space where Paul had stood was occupied a moment later by a man with a medical kit, who began to fuss with Giles' burns. Above the head of the working medic, Giles saw the tall shape of an Albenareth step into view and look down at him.

"Captain?" said Giles in Basic, uncertainly, even after all those days on the lifeboat; he could not

be sure to tell the one Albenareth he knew from those he did not know.

"I am satisfied," said the Captain. "It is apparently a real thing, this 'friendship'. There are others of our holy race that have been on such new worlds as this and had experiences with humans that suggest it is not uncommon—I am now told."

"Told . . ." said Giles. He looked about the room, at the other tall, dark shapes. "Where did they all come from?"

"I did not know," said the Captain. "But evidently, while you waited for me, your stillness and other unusual behavior aroused a concern in the mind of the one of our race who greeted you and sent for me. As a precaution, the local human police were contacted, and these ordered a listening device attached to your rock-buggy, while you were unnoticing. We were listened to as we talked and were followed here, by both my people and yours."

Giles shook his head feebly. The medician had just given him some kind of an injection and he was feeling the pain recede as strength returned, but he was still far from being himself.

"I don't understand," he said.

"We have been a subject of the attention of both our peoples, here on 20B-40, ever since we landed, Adelman," the Captain said. "As I may have said, our races on these new worlds seem closer to each other than in other places. But I wait for what you promised me."

"Promised?"

"You promised to tell me who it was among you humans who destroyed my ship. I wait to hear, now."

"Giles—" It was Mara, speaking beside him, warningly. He put up a hand to calm her.

"I'll tell you," he said.

"Giles!"

"No . . . no. It's all right," he said aside to her. "Listen . . ."

He turned back to the Captain.

"I set a bomb aboard your ship," he said.

"You?" The Captain's tall body moved almost imperceptibly toward him.

"Yes," Giles said. "It was part of a plan worked out by the Oca Front to get me to 20B-40 without arousing any suspicion on Paul Oca's part that one of us had been sent to kill him . . ." Giles shook his head briefly. "To think I left Earth intending to kill . . . but I was wrong about a good many things, then."

He looked back up at the Captain.

"The idea was that the bomb would damage your vessel enough so that you'd want to turn aside to 20B-40 for repairs. Once we'd landed here, I could leave the ship and find Paul."

"I am listening." The Captain's voice was expressionless, remote.

"To make the plan work," said Giles, wearily, "I had to set the bomb off at just the right time. Which was why I knew something about your course and the location of 20B-40 from the position at which the explosion occurred. Also—we thought—the bomb had to be just the right size so that the ship would be damaged enough to make you turn aside from your original course, but not damaged so much it couldn't make it safely to 20B-40. There was no plan for me to make the trip here in a lifeboat."

His voice was harsh as he ended.

"You planned," said the Captain. "But the bomb was larger than you thought?"

Giles shook his head.

"It was the right size," he said. "But it had help we hadn't counted on. Someone else wired another bomb to it—a much more powerful bomb that couldn't fail to wreck your ship completely." His voice took on an edge. "Good God, where would a bunch of amateur revolutionists like us get hold of something that would make metal burn like dry leaves?"

"Why this second bomb?" asked the Captain.

"Because there was another plan I didn't know anything about. It called for me to get to 20B-40 in a lifeboat, as we did. Not just me alone, but with a handful of people—" Giles lifted a heavy hand to indicate Mara and the other arbites from the lifeboat who still stood around his chair. "It was understood that if the ship died, you Albenareth would choose to die with her—all but one of you who'd pilot the lifeboat to safety, out of duty to save the few humans that remained."

"Why did you agree to this second bomb, this further plan?" demanded the emotionless voice of the Captain.

"I didn't. Neither did any of the others on the lifeboat, but one. That one identified herself, when I first came to this dome, here. Biset."

"The female I just killed?" said the Captain.

Giles nodded.

"Biset admitted she'd planned to bring these others, and herself, with me to 20B-40 in the lifeboat. By admitting that, she gave herself away. The only way she could have been sure of doing what she planned was if she set the second bomb herself—and made sure it was a bomb large enough, not only to destroy the ship, but to make sure no other arbites, except those she'd chosen back on Earth, lived to escape. I'll bet if it'd been possible to examine your ship before the bomb went off, we'd have found every lifeboat but the one we took was sabotaged, made unusable."

There was a long silence in the room. Finally, the Captain spoke. "How could she know that I"—the

alien voice broke, uncharacteristically, then went on as unemotionally as ever—"that *you* would be able to take command of the vessel and bring it to 20B-40, rather than Belben?"

"She didn't," said Giles. "She and her people were as ignorant as I was of Albenareth ways of thinking. It never occurred to her, any more than it did to me, that you'd do anything but head for the nearest safe planetfall, which was 20B-40. But when you insisted on going on to Belben instead, even if we all arrived dead, she was forced into using the joker in her deck—the one person she'd included just in case there was some dirty work to be done—"

He turned his head to look at Esteven.

"She supplied you not only with tonk but with paper to take with it, to begin with, didn't she?" Giles said. "Then, she claimed she was out of paper."

"And I believed her!" Esteven's face twisted. "I *believed* her! That's why I went for the Book."

"Yes," said Giles. He looked back at the Captain. "So now you know, Rayumung."

"Yes," said the Albenareth. Her head lifted. "And now that I know, I shall take back the child that is mine, and live. For I have canceled my dishonor by slaying the one who slew my ship; and there is also honor to be acquired in this thing you have given me, called 'friendship', as I shall explain it to others of my holy race."

"Yes," said Giles. "And when you've done that, there's another word you can introduce them to. It's called *cooperation*—and it can mean human and Albenareth as shipmates working vessels through space together."

"You have done much, Adelman," said the Captain, grimly. "Be warned. Do not try for too much, too soon."

The eyes were steady on Giles. Slowly, Giles nodded. "Perhaps you're right," he said. "Good luck, anyway, Rayumung."

"The holy race does not proceed by luck," said the Captain. "But by understanding of the Way, on which all things may journey."

She turned away. But just before going she turned back.

"All things but slaves," she said. "However, I find that I have changed my thought about these others here." Her gaze swept over the arbites about Giles. "They have proved themselves not slaves all save the one I have just slain. This, therefore, is the greater message I carry to the Albenareth; and 'friendship' is the lesser. For in truth, respect between us and you must come before all other things."

She turned and went, erect, unyielding, stalking from their presence with great and measured strides like someone who now saw her way clear to the uttermost reaches of eternity. ■

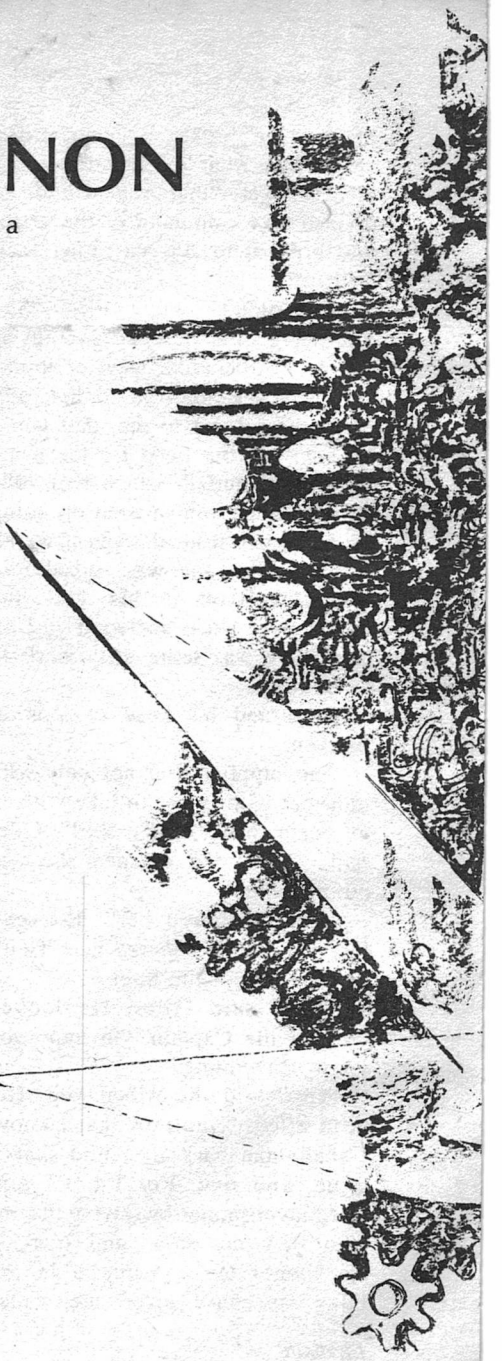
DOING LENNON

At the core of every human life is a fundamental question: Who am I?

GREGORY BENFORD

Sanity calms, but madness
is more interesting.

—John Russell



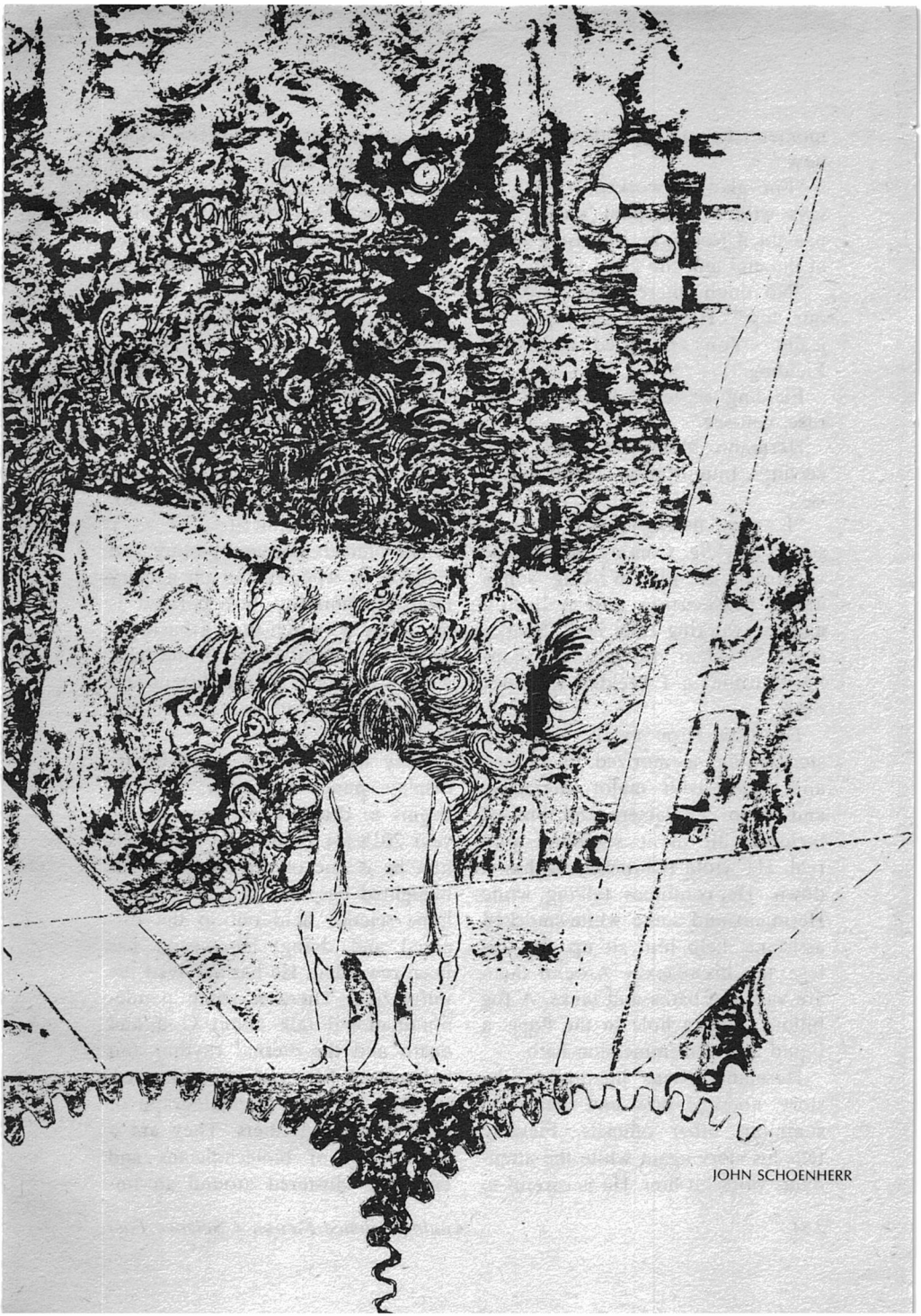
As the hideous cold seeps from him he feels everything becoming sharp and clear again. He decides he can do it, he can make it work. He opens his eyes.

"Hello." His voice rasps. "Bet you aren't expecting me. I'm John Lennon."

"What?" the face above him says.

"You know. John Lennon. The Beatles."

Professori Hermann—the name attached to the face which loomed over him as he drifted up, up from the Long Sleep—is vague about the precise date. It is either 2108 or 2180. Hermann makes a little joke about inversion of positional notation; it has something to do with nondenumerable set theory, which is all the rage. The ceiling glows with a smooth green phosphorescence and Fielding lies there letting them prick him with needles, unwrap his organiform nutrient webbing, poke and adjust and massage as he listens to a hollow *pock-pock-eta.* He knows this is the crucial


JOHN SCHOENHERR

moment, he must hit them with it now.

"I'm glad it worked," Fielding says with a Liverpool accent. He has got it just right, the rising pitch at the end and the nasal tones.

"No doubt there is an error in our log," Hermann says pedantically. "You are listed as Henry Fielding."

Fielding smiles. "Ah, that's the ruse, you see."

Hermann blinks owlishly. "Deceiving Immortality Incorporated is—"

"I was fleeing political persecution, y'dig. Coming out for the workers and all. Writing songs about persecution and pollution and the working class hero. Snarky stuff. So when the jackboot skinheads came in I decided to check out."

Fielding slips easily into the story he has memorized, all plotted and paced with major characters and minor characters and bits of incident, all of it sounding very real. He wrote it himself, he has it down. He continues talking while Hermann and some white-smocked assistants help him sit up, flex his legs, test his reflexes. Around them are vats and baths and tanks. A fog billows from a hole in the floor; a liquid nitrogen immersion bath.

Hermann listens intently to the story, nodding now and then, and summons other officials. Fielding tells his story again while the attendants work on him. He is careful to give the events in different order, with different details each time. His accent is standing up though there is mucous in his sinuses that makes the high sing-song bits hard to get out. They give him something to eat; it tastes like chicken-flavored ice cream. After a while he sees he has them convinced. After all, the late Twentieth was a turbulent time, crammed with gaudy events, lurid people. Fielding makes it seem reasonable that an aging rock star, seeing his public slip away and the government closing in, would corpsicle himself.

The officials nod and gesture and Fielding is wheeled out on a carry table. Immortality Incorporated is more like a church than a business. There is a ghostly hush in the hallways, the attendants are distant and reserved. Scientific servants in the temple of life.

They take him to an elaborate display, punch a button. A voice begins to drone a welcome to the year 2018 (or 2180). The voice tells him he is one of the few from his benighted age who saw the slender hope science held out to the diseased and dying. His vision has been rewarded. He has survived the unfreezing. There is some nondenominational talk about God and death and the eternal rhythm and balance of life, ending with a retouched holographic photograph of the Founding Fathers. They are a small knot of biotechnicians and engineers clustered around an im-

mersion tank. Close-cropped hair, white shirts with ball-point pens clipped in the pockets. They wear glasses and smile weakly at the camera, as though they have just been shaken awake.

"I'm hungry," Fielding says.

News that Lennon is revived spreads quickly. The Society for Dissipative Anachronisms holds a press conference for him. As he strides into the room Fielding clenches his fists so no one can see his hands shaking. This is the start. He has to make it here.

"How do you find the future, Mr. Lennon?"

"Turn right at Greenland." Maybe they will recognize it from *A Hard Day's Night.* This is before his name impacts fully, before many remember who John Lennon was. A fat man asks Fielding why he elected for the Long Sleep before he really needed it and Fielding says enigmatically, "The role of boredom in human history is underrated." This makes the evening news and the weekly topical roundup a few days later.

A fan of the Twentieth asks him about the breakup with Paul, whether Ringo's death was a suicide, what about Allan Klein, how about the missing lines from *Abbey Road?* Did he like Dylan? What does he think of the Aarons theory that the Beatles could have stopped Vietnam?

Fielding parries a few questions, answers others. He does not tell them, of course, that in the early Sixties he worked in a bank and wore granny glasses. Then he became a broker with Harcum, Brandels and Son and his take in 1969 was 57,803 dollars, not counting the money siphoned off into the two concealed accounts in Switzerland. But he read *Rolling Stone* religiously, collected Beatles memorabilia, had all the albums and books and could quote any verse from any song. He saw Paul once at a distance, coming out of a recording session. And he had a friend into Buddhism, who met Harrison one weekend in Surry. Fielding did not mention his vacation spent wandering around Liverpool, picking up the accent and visiting all the old places, the cellars where they played and the narrow dark little houses their families owned in the early days. And as the years dribbled on and Fielding's money piled up, he lived increasingly in those golden days of the Sixties, imagined himself playing side man along with Paul or George or John and crooning those same notes into the microphones, practically kissing the metal. And Fielding did not speak of his dreams.

It is the antiseptic Stanley Kubrick future. They are very adept at hardware. Population is stabilized at half a billion. Everywhere there are white hard decorator chairs in

vaguely Danish modern. There seems no shortage of electrical power or oil or copper or zinc. Everyone has a hobby. Entertainment is a huge enterprise, with stress on ritual violence. Fielding watches a few games of Combat Golf, takes in a public execution or two. He goes to witness an electrical man short circuit himself. The flash is visible over the curve of the Earth.

Genetic manipulants—*manips*, Hermann explains—are thin, stringy people, all lines and knobby joints where they connect directly into machine linkages. They are designed for some indecipherable purpose. Hermann, his guide, launches into an explanation but Fielding interrupts him to say, "Do you know where I can get a guitar?"

Fielding views the era 1950-1980:

"Astrology wasn't rational, nobody really believed it, you've got to realize that. It was *boogie woogie*. On the other hand, science and rationalism were progressive jazz."

He smiles as he says it. The 3D snout closes in. Fielding has purchased well and his plastic surgery, to lengthen the nose and give him that wry Lennonesque smirk, holds up well. Even the technicians at Immortality Incorporated missed it.

Fielding suffers odd moments of blackout. He loses the rub of rough cloth at a cuff on his shirt, the chill of air-conditioned breeze along his neck. The world dwindles away and sinks into inky black, but in a moment it is all back and he hears the distant murmur of traffic, and convulsively, by reflex, he squeezes the bulb in his hand and the orange vapor rises around him. He breathes deeply, sighs. Visions float into his mind and the sour tang of the mist reassures him.

Every age is known by its pleasures, Fielding reads from the library readout. The Twentieth introduced two: high speed and hallucinogenic drugs. Both proved dangerous in the long run, which made them even more interesting. The twenty-first developed weightlessness, which worked out well except for the re-entry problems if one overindulged. In the Twenty-second there were aquaform and something Fielding could not pronounce or understand.

He thumbs away the readout and calls Hermann for advice.

Translational difficulties:

They give him a sort of pasty suet when he goes to the counter to get his food, he shoves it back at them.

"Gah! Don't you have a hamburger someplace?" The stunted man behind the counter flexes his arms, makes a rude sign with his four fingers and goes away. The wiry woman next to Fielding rubs her thumbnail along the hideous

scar at her side and peers at him. She wears only orange shorts and boots, but he can see the concealed dagger in her armpit.

"Hamburger?" she says severely. "That is the name of a citizen of the German city of Hamburg. Were you a cannibal then?"

Fielding does not know the proper response, which could be dangerous. When he pauses she massages her brown scar with new energy and makes a sign of sexual invitation. Fielding backs away. He is glad he did not mention french fries.

On 3D he makes a mistake about the recording date of *Sergeant Pepper's Lonely Hearts Club Band.* A ferret-eyed history student lunges in for the point but Fielding leans back casually, getting the accent just right, and says, "I zonk my brow with heel of hand, consterned!" and the audience laughs and he is away, free.

Hermann has become his friend. The library readout says this is a common phenomenon among Immortality Incorporated employees who are fascinated by the past to begin with (or otherwise would not be in the business) and anyway Hermann and Fielding are about the same age, forty-seven. Hermann is not surprised that Fielding is practicing his chords and touching up his act.

"You want to get out on the road again, is that it?" Hermann says. "You want to be getting popular."

"It's my business."

"But your songs, they are old."

"Oldies but goldies," Fielding says solemnly.

"Perhaps you are right," Hermann sighs. "We are starved for variety. The people, no matter how educated—anything tickles their nose they think is champagne."

Fielding flicks on the tape input and launches into the hard-driving opening of *Eight Days a Week.* He goes through all the chords, getting them right the first time. His fingers dance among the humming copper wires.

Hermann frowns but Fielding feels elated. He decides to celebrate. Precious reserves of cash are dwindling, even considering how much he made in the international bond market of '83; there is not much left. He decides to splurge. He orders an alcoholic vapor and a baked pigeon. Hermann is still worried but he eats the mottled pigeon with relish, licking his fingers. The spiced crust snaps crisply. Hermann asks to take the bones home to his family.

"You have drawn the rank-scented many," Hermann says heavily as the announcer begins his introduction. The air sparkles with anticipation.

"Ah, but they're *my* many," Fielding says. The applause begins,

the background music comes up and Fielding trots out onto the stage, puffing slightly.

"One, two, three—" and he is into it, catching the chords just right, belting out a number from *Magical Mystery Tour.* He is right, he is on, he is John Lennon just as he always wanted to be. The music picks him up and carries him along. When he finishes, a river of applause bursts over the stage from the vast amphitheater and Fielding grins crazily to himself. It feels exactly the way he always thought it would. His heart pounds.

He goes directly into a slow ballad from the *Imagine* album to calm them down. He is swimming in the lights and the 3D snouts zoom in and out, bracketing his image from every conceivable direction. At the end of the number somebody yells from the audience, "You're radiating on all your eigenfrequencies!" And Fielding nods, grins, feels the warmth of it all wash over him.

"Thrilled to the gills," he says into the microphone.

The crowd chuckles and stirs.

When he does one of the last Lennon numbers, *The Ego-Bird Flies,* the augmented sound sweeps out from the stage and explodes over the audience. Fielding is euphoric. He dances as though someone is firing pistols at his feet.

He does cuts from *Beatles '65, Help!, Rubber Soul, Let It Be*—all with technical backing spliced in from the original tracks, Fielding providing only Lennon's vocals and instrumentals. Classical scholars have pored over the original material, deciding who did which guitar riff, which tenor line was McCartney's, dissecting the works as though they were salamanders under a knife. But Fielding doesn't care, as long as they let him play and sing. He does another number, then another, and finally they must carry him from the stage. It is the happiest moment he has ever known.

"But I don't understand what Boss 30 radio means," Hermann says.

"Thirty most popular songs."

"But why today?"

"Me."

"They call you a 'sonic boom sensation'—that is another phrase from your time?"

"Dead on. Fellow is following me around now, picking my brains for details. Part of his thesis, he says."

"But it is such noise—"

"Why, that's a crock, Hermann. Look, you chaps have such a small population, so bloody few creative people. What do you expect? Anybody with energy and drive can make it in this world. And I come from a time that was dynamic, that really got off."

"Barbarians at the gates," Hermann says.

"That's what *Reader's Digest*

said, too," Fielding murmurs.

After one of his concerts in Australia Fielding finds a girl waiting for him outside. He goes home with her—it seems the thing to do, considering—and finds there have been few technical advances, if any, in this field either. It is the standard, ten-toes-up, ten-toes-down position she prefers, nothing unusual, nothing *a la carte*. But he likes her legs, he relishes her beehive hair and heavy mouth. He takes her along; she has nothing else to do.

On an off day, in what is left of India, she takes him to a museum. She shows him the first airplane (a piper cub), the original manuscript by Fuller and Hemingway, a delicate print of *The Fifty-Three Stations of the Takaido Road* from Japan.

"Oh yes," Fielding says. "We won that war, you know."

(He should not seem to be more than he is.)

Fielding hopes they don't discover, with all this burrowing in the old records, that he had the original Lennon killed. He argues with himself that it really was necessary. He couldn't possibly cover his story in the future if Lennon kept on living. The historical facts would not jibe. It was hard enough to convince Immortality Incorporated that even someone as rich as Lennon would be able to forge records and change fingerprints—they had checked that—to escape the authorities. Well, Fielding thinks, Lennon was no loss by 1988 anyway. It was pure accident that Fielding and Lennon had been born in the same year, but that didn't mean that Fielding couldn't take advantage of the circumstances. He wasn't worth over ten million fixed 1985 dollars for nothing.

At one of his concerts he says to the audience between numbers, "Don't look back—you'll just see your mistakes." It sounds like something Lennon would have said. The audience seems to like it.

Press Conference.

"And why did you take a second wife, Mr. Lennon, and then a third?" In 2180 (or 2108) divorce is frowned upon. Yoko Ono is still the Beatle nemesis.

Fielding pauses and then says, "Adultery is the application of democracy to love." He does not tell them the line is from H. L. Mencken.

He has gotten used to the women now. "Just cast them aside like sucked oranges," Fielding mutters to himself. It is a delicious moment. He had never been very successful with women before, even with all his money.

He strides through the yellow curved streets, walking lightly on the earth. A young girl passes, winks.

Fielding calls after her, "Sic Transit, Gloria!"

It is his own line, not a copy from Lennon. He feels a heady rush of joy. He is into it, the ideas flash through his mind spontaneously. He is doing Lennon.

Thus, when Hermann comes to tell him that Paul McCartney has been revived by the Society for Dissipative Anachronisms, the body discovered in a private vault in England, at first it does not register with Fielding. Lines of postcoital depression flicker across his otherwise untroubled brow. He rolls out of bed and stands watching a wave turn to white foam on the beach at La Jolla. He is in Nanking. It is midnight.

"My old bud, then?" he manages, getting the lilt into the voice still. He adjusts his granny glasses. "You know, I don't think I'll know how to deal with him. I really don't know." Something swells up inside him—

And Fielding's world collapses.

The walls fold. Colors drain away, scarlet to pink to gray. Darkness rushes in.

He is watching a blank dark wall, smelling nothing, no tremor through his skin, no wet touch of damp air. Sliding infinite silence. The world is black.

—Flat black, Fielding adds, like we used to say in Liverpool.

—Liverpool? He was never in Liverpool. That was a lie, too—

—And he knows instantly what he is. The truth skewers him.

Hello, you still operable?

Fielding rummages through shards of cold electrical memory and finds himself. He is not Fielding, he is a simulation. He is Fielding Prime.

Hey, you in there. It's me, the real Fielding. Don't worry about security, I'm the only one here.

Fielding Prime feels through his circuits and discovers a way to talk. "Yes, yes, I hear."

I made the computer people go away. We can talk.

"I—I see." Fielding Prime sends out feelers, searching for his sensory receptors. He finds a dim red light and wills it to grow brighter. The image swells and ripples, then forms into a picture of a sour-faced man in his middle fifties. It is Fielding Real.

Ah, Fielding Prime thinks to himself in the metallic vastness, he's older than I am. Maybe making me younger was some sort of self-flattery, either by him or his programmers. But the older man had gotten someone to work on his face. It was very much like Lennon's but with heavy jowls, a thicker mustache and balding some. The gray sideburns didn't look quite right but perhaps that is the style now.

The McCartney thing, you couldn't handle it.

"I got confused. It never occurred to me there'd be anyone I

knew revived. I hadn't a clue what to say."

Well, no matter. The earlier simulations, the ones before you, they didn't even get that far. I had my men throw in that McCartney thing as a test. Not much chance it would occur, anyway, but I wanted to allow for it.

"Why?"

What? Oh, you don't know, do you? I'm sinking all this money into psychoanalytical computer models so I can see if this plan of mine would work. I mean whether I could cope with the problems and deceive Immortality Incorporated.

Fielding Prime felt a shiver of fear. He needed to stall for time, to think this through. "Wouldn't it be easier to bribe enough people now? You could have your body frozen and listed as John Lennon from the start."

No, their security is too good. I tried that.

"There's something I noticed," Fielding Prime said, his mind racing. "Nobody ever mentioned why I was unfrozen."

Oh yes, that's right. Minor detail. I'll make a note about that—maybe cancer or congestive heart failure, something that won't be too hard to fix up within a few decades.

"Do you want it that soon? There would still be a lot of people who knew Lennon."

Oh, That's a good point. I'll talk to the doctor about it.

"You really care that much about being John Lennon?"

Why, sure. Fielding Real's voice carried a note of surprise. *Don't you feel it too? If you're a true simulation you've got to feel that.*

"I do have a touch of it, yes."

They took the graphs and traces right out of my subcortical.

"It was great, magnificent. Really a lark. What came through was the music, doing it out. It sweeps up and takes hold of you."

Yeah, really? Damn, you know, I think it's going to work.

"With more planning—"

Planning, hell. I'm going. Fielding Real's face crinkled with anticipation.

"You're going to need help."

Hell, that's the whole point of having you, to check it out beforehand. I'll be all alone up there.

"Not if you take me with you."

Take you? You're just a bunch of germanium and copper.

"Leave me here. Pay for my files and memory to stay active."

For what?

"Hook me into a news service. Give me access to libraries. When you're unfrozen I can give you backup information and advice as soon as you can reach a terminal. With your money, that wouldn't be too hard. Hell, I could even take care of your money. Do some trading, maybe move your accounts out of countries before they fold up."

Fielding Real pursed his lips. He thought for a moment and looked shrewdly at the visual receptor.

That sort of makes sense. I could trust your judgment—it's mine, after all. I can believe myself, right? Yes, yes . . .

"You're going to need company." Fielding Prime says nothing more. Best to stand pat with this hand and not push him too hard.

I think I'll do it. Fielding Real's face brightens. His eyes take on a fanatic gleam. *You and me. I know it's going to work, now!*

Fielding Real burbles on and Fielding Prime listens dutifully to him, making the right responses without effort. After all, he knows the other man's mind. It is easy to manipulate him, to play the game of ice and steel.

Far back, away from where Fielding Real's programmers could sense it, Fielding Prime smiles inwardly (the only way he could). It will be a century, at least. He will sit here monitoring data, input and output, the infinite dance of electrons. Better than death, far better. And there may be new developments, a way to transfer computer constructs to real bodies. Hell, anything could happen.

Boy, it's cost me a fortune to do this. A bundle. Bribing people to keep it secret, shifting the accounts so the Feds wouldn't know—and you cost the most. You're the best simulation ever developed, you realize that? Full consciousness, they say.

"Quite so."

Let him worry about his money—just so there was some left. The poor simple bastard thought he could trust Fielding Prime. He thought they were the same person. But Fielding Prime had played the chords, smelled the future, lived a vivid life of his own. He was older, wiser. He had felt the love of the crowd wash over him, been at the focal point of time. To him Fielding Real was just somebody else, and all his knife-sharp instincts could come to bear.

How was it? What was it like? I can see how you responded by running your tapes for a few sigmas. But I can't order a complete scan without wiping your personality matrix. Can't you tell me? How did it feel?

Fielding Prime tells him something, anything, whatever will keep the older man's attention. He speaks of ample-thighed girls, of being at the center of it all.

Did you really? God!

Fielding Prime spins him a tale.

He is running cool and smooth. He is radiating on all his eigenfrequencies. *Ah* and *ah.*

Yes, that is a good idea. After Fielding Real is gone, his accountants will suddenly discover a large sum left for scientific research into man-machine linkages. With a century to work, Fielding Prime can find a way out of this computer prison. He can become somebody else.

Not Lennon, no. He owed that much to Fielding Real.

Anyway, he had already lived through that. The Beatles' music was quite all right, but doing it once had made it seem less enticing. Hermann was right. The music was too simple-minded, it lacked depth.

He is ready for something more. He has access to information storage, tapes, consultant help from outside, all the libraries of the planet. He will study. He will train. In a century he can be anything. Ah, he will echo down the infinite reeling halls of time.

John Lennon, hell. He will become Wolfgang Amadeus Mozart. ■

the reference library

Lester del Rey

OUR IMPERISHABLE PAST

Science fiction was once regarded as a transient phenomenon, sure to perish quickly. That idea seems to be pretty well disproved by now; we're almost fifty years old as a separate category of literature, and still going strong—in fact, with a larger share of the literary market than ever before. Even the individual stories refuse to disappear quietly, since many that were written thirty or forty years ago are still being anthologized or reprinted. The science may be a bit out of date and the predictions of the future may have turned out to be false guesses, but something in them seems to give them an imperishable attraction.

In another sense, however, most science fiction has always been highly perishable. Whether in magazines or in books, it was usually printed on the cheapest of paper. Pages no more than two decades old have turned yellow and are beginning to grow brittle, even when carefully stored and handled. Covers are coming loose and the glue used to "bind" the books has dried and cracked, letting pages fall out.

Even the older hard-cover volumes are beginning to show signs of decay, when they can be found at all. The few copies that have survived are sometimes available from dealers, but the prices are astronomical; or they are hoarded jealously by collectors. Yet the new interest being shown by scholars in the history and development of science fiction makes it imperative that these books somehow be made available to students and college libraries.

Fortunately, something is finally being done about the problem. Hyperion Press has recently issued a group of classic science fiction, mostly from the period before there were magazines specializing in the literature. Unlike the typical commercial books, these are designed to last for centuries. They are stitched rather than glued, and they are printed on paper that is supposed to last for a minimum of two hundred years.

Paper, at its best, is one of the more enduring of man's creations. There are a great many examples to prove it can last for more than a thousand years, with proper care. And modern paper, when free of the sulfites and other chemicals used to prepare the cheaper products made from wood pulp, can be

as good as the ancient kind.

The books are offset from earlier editions, but the type looks sharp and the ink is dark enough for easy reading. Where illustrations were used in the original, they are also reproduced in these books. They also have generous margins, and they open out easily, so that they are a pleasure to read and handle.

Sam Moskowitz served as editor and advisor, and there are twenty-three of these early classics in the series. In addition, six books are offered by Moskowitz, giving the history of science fiction, fandom, and the major writers of the category. All these books are available in hard covers, at prices varying from $7.50 to $13.95. Those prices are not unreasonable for the quality and length of the books—particularly when some contain all the material that originally appeared in more than one volume. For those who want volumes to read, rather than to preserve, all the books are also available in paper binding, ranging in price from $2.95 to $5.50. They have the same stitching and high-quality paper, incidentally, and are printed identically. Personally, because of my limited book space, I prefer the paper-bound volumes.

If anyone wants to have a list of all the books with details of the contents, Hyperion has printed a brochure that is itself unusually attractive. Write for it: Hyperion Press, Inc., 45 Riverside Avenue, Westport, Conn., 06880. I don't intend to list all of them here.

Some of the books strike me as being of far more interest to students of our history than to mere readers. *Peter Wilkins,* by Robert Paltock, for instance, was published in 1751—which is the most interesting thing about it, unless any book about winged human beings turns you on. But a number of the books are ones that still have great appeal, just as stories to be read and enjoyed.

George Allan England's *Darkness and Dawn* has remained popular among those who know the work since it was first printed. It has been reprinted—sometimes in abridged or separated form—a number of times, and always received with acclaim. Here all three volumes of the original trilogy are printed in one book, as they should be. It remains a moving and sometimes terrifying vision of the future, and one of the best stories I know of survival in a ruined world of the far future. Karel Čapek's *The Absolute at Large* contains one of the most original ideas of science fiction; when a means of releasing the power in the atoms is invented, it is discovered that a tiny bit of God is released from each atom—and there are accumulations of miracle-working God around each atomic plant!

A Columbus of Space and *The Second Deluge,* both by Garrett P. Serviss, creak a bit now. But I can remember still the delight with which I read them when they were published in the early magazines, and they still have much of their power after all these years. Harold Lamb's *Marching Sands* doesn't creak at all. He was a great writer of historical tales with a fine vigor

to his prose, and his story of the past here makes far better reading than many current attempts.

Philip Wylie's *Gladiator* was one of the early stories of a superman. In my opinion, it was one of his best novels. And for those who remember Stanley G. Weinbaum (or the lucky ones who have only heard of him), *A Martian Odyssey and Other Tales* contains all his short stories and novelettes, originally published in two volumes some twenty-five years ago. They're still lively, enjoyable stories, surprisingly undated.

Then there is Sam Moskowitz' *The Immortal Storm,* which has become a rare classic to readers interested in all the early details of the world of science fiction. This was originally a series of articles for fan magazines, later collected into a book by one of the fan publishing houses that flourished briefly. It has long been out of print, and I'm glad to see it back. It's a curious book, often seeming to treat the feuds and affairs of fandom as the only serious events in the world, far more important than any world war could ever be. Yet in doing so, it presents the attitudes of the early world of fandom in the only way they could be shown honestly.

Another book which I enjoyed and have been recommending for several years is *Under the Moons of Mars,* by Sam Moskowitz. This is a huge volume, containing excerpts and stories from the early "scientific romances" published by the Munsey magazines, with a long and detailed history of those publications and the writers, such as Edgar Rice Burroughs, who made such stories favorites, and who paved the way for much of the appeal of later science fiction.

For those who want all the Hyperion books—as I understand a surprising number of readers do—the complete 29-volume paperbound set sells for $103.62; and they'll then discount the last-mentioned Moskowitz book to $5.96, bringing the average price per volume for thirty books down to $3.65—which is a bargain at the current cost of books.

This is only the beginning. Other publishers are also planning to enter the field with similar endeavors. I have recently selected about fifty volumes for such a program. These will be later books, picked from works that have had only paper editions or which are long out of print, but which are still regarded as favorites by the readers. They will also be printed on "two hundred year" paper for use in libraries. And I hear of others also planning to bring out science fiction for permanent reference uses.

The evidence that libraries and students are beginning to treat science fiction as part of the serious literature of our time is considerable. Now I'm wondering when they'll get around to making imperishable copies of the older magazines, complete with blurbs and reader-columns.

It's rather surprising to find that there are still stories in those magazines which have escaped publication previously in book form and which are still good, by any stan-

dards. But such seems to be the case, as shown by *The Man Who Awoke*, by Lawrence Manning (Ballantine Books, 192 pp., $1.50). This appeared back in 1933 in five installments. It has lain neglected for over forty years!

Manning was a writer who could hardly exist in our world today. He loved science fiction and was fascinated by it, as I discovered in numerous conversations with him across the cocktail table. He also had a strong respect for science. But he was a genuinely modest man who never really considered himself a writer, though he had sold two extremely popular novels and a number of short stories before the period known as the Golden Age. (Can anyone imagine a writer today with that much success who doesn't immediately begin dreaming of Hugo awards and setting himself up as an artist?)

This book originally was presented as a series of novelettes, but it is so tightly bound into an overall pattern that it must be considered a true novel. When it appeared in the magazines, it aroused more interest and approval from the readers than any other series or novel. Had there been a Hugo at the time, it would surely have won the award easily.

It deals with a man who finds a way to suspend animation for long periods. Norman Winters retires, hoping to come out into a better world. He first wakes in the year 5000—to find that things are not at all what he expected. And for those who think pollution and ecology are new words, or that science fiction has only recently turned to those subjects, this should be must-reading. Manning was obviously very much aware of the coming problems of such things as the despoiling of our Earth and the exhaustion of our resources back in those days. His vision of the life of our descendants was a lot clearer then than I feel some of the visions I read in current books will prove to be.

Anyhow, Winters finds that the world into which he has awakened is not the one he wants. He returns to his creche, to sleep through another 5000 years. And this begins his expedition onward into the future. At each awakening, he finds the culture and civilization of man completely changed from what has gone before. Quite correctly, Manning assumed that man does not progress in a straight line—as seemed to be the idea of many writers of that period. There are fits and starts, retreats and advances, and even side trails. And Winters goes on, awakening at 5000-year intervals, until the final episode.

In the end, he does not find what he sought. But he does find something that at least promises a world into which he can fit and from which he can derive some hope for man.

The book is essentially united, in fact, by the philosophical ideas of Manning. That philosophy was probably what made the work so appealing when it first appeared; and it still stands up and brings strength and vigor to the novel today. ■

Dear Mr. Bova:

Congratulations on printing Hayford Peirce's "Unlimited Warfare" (November, 1974 issue). Nothing like it since Chesterton and Belloc, in the twenty-three years I've been devouring your magazine. I don't wish to sound carping, but "oidium phylloxera"! Isn't a generic name spelled in upper case letters or initials any longer? Some of us old-timers like to think of our Astounding/Analog as perfect in every way.

DR. PAUL HAMMET LE BRUN
284, Wolverhampton Road West
Bentley, Walsall
Great Britain

Perfection is something we strive for; Oidium should have been capitalized. We're glad you found the story itself to be Capital! The author has his own explanation:

Dear Ben:

In point of sheer fact, I was betrayed by what Colonel Christie, with his usual wrong-headedness, was pleased to call "the inestimable" *Quid?*, the French version of the *World Almanac.*

Page 907 of the 1973 *Quid?* states didactically, *"Principaux ennemis:* mildiou, oidium phylloxera, viroses."

Page 1851 of my second-edition unabridged is kind enough to show four pictures of phylloxera, "A genus of plant lice."

Elsewhere, oidium is clearly defined as powdery mildew.

Clear enough, you say.

However, I asked myself, who knows more about wine and its enemies, Frenchmen or Americans? The answer was obvious. Oidium phylloxera therefore became a fungus. Only now has it occurred to me that the wretched *Quid?* simply omitted a comma between the words *oidium* and *phylloxera.*

To my mind, a far more ghastly error is also to be found on page 153: someone, perhaps the same Kindly Proofreader who omitted the comma, thoughtfully but incorrectly changed *vin de table* to *vin du table,* thereby risking French retaliation in the form of destruction of the Hamburger and the American Way of Life.

Somewhat shorter is John Campbell's reply in the July 1968 Analog to a reader who had the temerity to point out an absurdity in an ear-

lier Harry Harrison story: "You know–I missed that one, and so did Harry Harrison!"

HAYFORD PEIRCE

Dear Ben:

I suppose that the major reaction the two editorials on teaching science fiction provoked in me was one of amusement. There is something incredibly funny about all this serious discussion. Particularly if it is applied to what passes for science fiction these days.

Teaching science fiction as a separate subject in the schools seems a complete waste of time. Most SF classes I've seen have been snap courses designed to give a grade in English to those students who are either too lazy or too ignorant to handle a more academic English class. If they show up for class and read–or pretend to–they get a grade. The more rabid proponents of academic science fiction seem to feel they are bringing some sort of enlightenment to the students. In fact they are making a solid contribution to general ignorance.

In his editorial James Gunn says that most of those in the science fiction classes do not read magazines. Considering the state of magazine SF these days, I can't blame them. In the November Analog, for example, there is only one story worth bothering with: Joe Haldeman's "This Best of All Possible Worlds" is the best of the lot and (sigh) it wasn't all that good.

Robinson's "When No Man Pursueth" is simply an elaborate, overlong, unfunny joke. "Unlimited Warfare" is lightly amusing froth. Modesitt's "A House By Any Other Name" is a piece of anti-union propaganda. And Bester's "The Indian Giver"–I'm not sure what that is other than unreadable . . . I gave up on it somewhere around page 40.

Really, Ben, has the quality of the field sunk so low that this is the best there is available?

It's enough to drive one back to Doc Smith.

ROY TACKETT

915 Green Valley Road NW
Albuquerque, New Mexico 87107

There's no accounting for taste, although we agree that most SF courses are laughable.

Dear Mr. Bova:

I would like to comment on Joe Haldeman's "Forever War" series. I did not like the first story in the series. Indeed I was so repelled by it that at this moment I am not certain I read all of it. However, as the series developed, my interest in it developed. When the January issue of Analog arrived in the mail today the first thing I thought of was "End Game" and that was the first story I read.

"The Forever War" is one of the best series I have seen in over twenty years of reading Astounding/Analog . . .

I hope that the stories are published in book form by someone. And I hope that Joe Haldeman returns soon with another series.

DAVID RORER

137 Warner St.
Cincinnati, Ohio

"The Forever War" has been published in hardback by St. Martin's

Press. And Haldeman is still writing, rest assured.

Dear Mr. Bova:

Your November issue has prompted me to write, the first issue in five years different enough to do so. I was greatly impressed with the optimism of the issue, something that has been lacking from SF for quite a while now. Science fiction has been overwhelmed lately with depressing collapse-of-just-about-everything stories that present no new ideas, just extrapolation of present ideas.

The Guest Editorial was an excellent rebuttal to your June Editorial. However, I think he missed the point that SF cannot afford to be misrepresented at all. There has already been too much criticism of SF (BEM's, LGM, *et al.),* for the field to hold up under any bad treatment in schools.

One other comment: Mr. Gunn mentions the increasing sales in SF paperbacks. How much of this, I wonder, is Perry Rhodan and Cap Kennedy? I shudder to think of it.

"The Indian Giver" was a masterpiece in plot and characterization blended with idea. OK, immortals have been done before, but never like this! My only complaint is that the Group has the potential to become a long, long series, but will probably end after this novel.

Spider Robinson's tale was very good, if only for the imaginative worlds and their experimental societies that formed the background for the tale. If anybody earned his award this year, it was Robinson.

"A House by Any Other Name" was definitely better than the earlier story, "The Great American Economy." The dialog was a little less ridiculous and pedantic.

"This Best of All Possible Worlds" did a fine job of portraying the planet Heaven, as well as being an interesting addition to the Tauran war plot. Haldeman still hasn't justified the expense of the thousand-year war that is being fought. Surely there are enough worlds for two races out there.

"Unlimited Warfare" was pretty good humor, and posed an interesting (to say the least) alternative to all-out war . . .

Haven't the fans grown up enough yet to stop confusing a single story with an editorial policy? A "leftist" story appears—Bova is a Commie. He publishes a war story—he's a right-winger. Someone says s-e-x and Analog becomes porno. I, for one, am getting tired of it. (Don't you?)

DOUGLAS S. CAREY
11355 Lincoln St.
Robertsville, Ohio 44670

Sometimes. But when all the readers agree on a subject, life can get rather dull.

Dear Ben:

I really liked the first segment of Alfie Bester's new novel ("The Indian Giver") in the November, 1974 issue of Analog. Not since his last has he come out with such a good one!

Few authors write as well as Bester. Heinlein, Asimov, Clarke, Simak, Sturgeon, all write such as this, but unfortunately there is one problem of quantity; quality is al-

ways of unquestionable merit. These guys don't write enough to satisfy me, or most others. The supreme greatness of their work is only neared by, regrettably, the infrequentness of it. This is a shame.

In the meantime, as an editor, as a fellow fan, I suggest that you encourage them to write! It is your duty as the Editor of the best professional magazine anywhere, to get these demi-gods to write. Science fiction misses their work.

SCOTT C. SMITH
10418 Hayvenhurst Ave.
Grenada Hills, Cal. 91344

Will the gentlemen mentioned please take note?

Dear Ben:

I've just read your December Editorial.

I think you miss one point. It would be nice to find life on Mars, but not entirely necessary to keep the space effort going.

What do you think would happen if the Viking lander hurled out a scoop and dragged in a sample of Mars, dripping with oil?

CLIFFORD D. SIMAK

The first thing that would happen would be that the international oil cartel would go interplanetary.

Dear Mr. Bova:

If Easton ("The Biopump Solution," December, 1974) wants a real lineup of ass-kissing yahoos to man his biopumps, why not use the members of the scientific establishment and their camp-followers? These over-educated, under-talented, and otherwise hyphenated jerks could be put to work alleviating the problems caused by the inadequate sewage systems in some of our cities. They are certainly no good for anything else.

The energy crisis is the result of bad science managed by incompetent scientists. If these people would shape up and do their job half as well as most "government bureaucrats and oil company executives" do theirs, we wouldn't have an energy crisis.

Easton probably thinks he is cute, but I for one don't see anything funny about "The Biopump Solution" at all.

STAN DECKE
317 E. Livingston St.
Orlando, Florida 32801

Those "incompetent" scientists have produced advanced energy systems such as MHD generators, solar cells, fuel cells, nuclear reactors and fusion experiments. The reason we still use Edison's generators and Otto's four stroke gasoline burners is that those bureaucrats and executives have ignored or stopped avanced scientific research and development.

Dear Mr. Bova:

The December issue is certainly a surprise. The quality of the contents varies wildly from respectably high to dismally low (perhaps the low Martian atmospheric pressure was responsible) . . .

It is Bester's serial that inspires my invective. Not only is it insulting and offensive to Christians and Union Carbide stockholders (a not mutually exclusive group; I happen to be both), but it goes out of its way to be offensive and insulting. I picture Bester (not a

pleasant thought to begin with) as actively compiling a list of contemporary values and organizations to be slandered. ("Whoops—I've neglected to offend the Moslems . . .") As a writer trying to enter the market, I can't help resenting Bester's getting paid for such drivel. I do hope that Analog will have filled its quota for trash for the next year by publishing "The Indian Giver." (Oh, yes—Indians should be offended, too.)

MARY H. SCHAUB

De gustibus . . .

Dear Mr. Bova:

I have been reading Analog for fifteen years, usually with great pleasure, but sometimes with exasperation. Finally I am moved to write by Parts I and II of Bester's "The Indian Giver." I can only say, Bravo!

The quality of articles and stories in Analog has been improving steadily in the last year and once again I can hardly wait to find what goodies lurk within that plain brown wrapper. Back to Bester—"The Indian Giver" is a puzzle in language, history, theology, science, and a Whodunit of the first order. I hope to see much more of the molemen in the future.

I have also greatly enjoyed Spider Robinson's stories from Callahan's Place. Would that Callahan's was in my community! I would refer many of my counseling clients to Callahan, and I think I'd even pass up reading the latest Analog to visit there myself. (Is it possible that Mr. David Bean writing in the December issue is a Callahan freak? "Kissing a control panel and blasting off into the sunset . . ." Really now. That's even weirder than playing with girls.) Keep up the good work.

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Gibson, Iowa 50104

. . . non es disputandum.

Dear Mr. Bova:

With the exception of the cover, I want to congratulate you for an excellent December issue. However, after the buildup in the preceding Analog, I was very disappointed in the cover photograph, on several counts. The first is that it looks exactly like a very small-scale miniature model. This is emphasized by the "mining equipment" supposedly assembled from various model pieces culled from everywhere in Mike Gilbert's collection, which are actually undisguised Revell U-2 model assemblies, used with so little change that everyone I know recognized them at first glance. The lack of depth of field could easily have been eliminated by use of a pinhole aperture on his 35mm camera—as nearly every model-making magazine has explained in detail often. The downward angle of view, rather than an "eye level" one along with miners, shrinks his scale.

He could also have easily forced his perspective, so that his sand texture grew smaller—finally becoming textureless—as it approached the horizon, and by grading the size, texture and color of his rubble as it moves toward the background. After all, that horizon

is two miles away. This is all in addition to the fact that his photos do look more like the Badlands of South Dakota than Mars.

I think that the photographic cover, using models, is an excellent idea (see some of G. Harry Stine's model space-ship covers), but they'll have to successfully compete with the painted cover before I would care to see any more.

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The requirements of a successful cover illustration are many and varied—sometimes even conflicting. Gilbert's photograph was composed to produce a cover that would be (a) eye-catching; (b) clearly science fictional; and (c) technically accurate. A long vista seen from eye-level might have made a better museum exhibit, where people can stand, inspect, and admire—but it would have made a rather poor cover, because it would not have met the first two criteria.

Dear Mr. Bova:

I found Richard C. Hoagland's article about the Viking mission in the December issue of Analog to be quite interesting. However, one point that must be considered before passing a gloomy judgment on the mission's ability to detect Martian life, and Mr. Hoagland himself mentions this, is that life as we know it can exist under conditions that presently exist on Mars. It is quite possible that soil microbes from arctic or high altitude regions of a warmer Mars evolved with the changing climate and are now widespread in the planet's soil. Living in the soil would provide protection from ultraviolet radiation, and perhaps warmer and wetter microclimates. Whether or not they can be detected by the experiments on Viking depends on the type of metabolism they have.

An even more interesting point brought up in the article is the fact that the climate of Mars seems from the evidence to have been warmer in the past than it is now. As we know, the climate of our planet has also fluctuated. It seems to have been warmer, or colder over various geologic periods. Some of the most worthwhile data that could be gained from a long-term exploration of Mars could be the correlation of the fluctuations of the Martian climate with the sometimes rapid fluctuations of our own climate during the Pleistocene and the Recent (see *Science,* 13 October 1972). From such studies we might be able to determine whether large-scale changes in climate are due to the planet itself, e.g. vulcanism or orbital causes, or by fluctuation of the production of solar energy.

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The current explanation for Mars' "Ice Age" is that the planet's orbital eccentricity and axial precession causes a freeze-out of most of the available water, in cycles of tens of millennia. But if Mars' glaciations and Earth's are somehow linked, it lays the blame for an interplanetary Ice Age on solar energy fluctuations.

F. Paul Wilson *continued from page 10*

over the protestations of its membership.

We will have NHI, maybe not this year, and perhaps not next year, but Congress will eventually get where it wants to go. We will have NHI not because we need it, but because the people in Washington want it. And don't be lulled into false security by thinking that the power of the vote will save you. A passage from Panshin's *Starwell* is appropriate here: "Celebrities . . . meet only fools, creeps, panhandlers and climbers. People they would truly like to meet never have the bad taste to present themselves. The quality that makes them worth meeting automatically determines that they will never be met."

Substitute "voters" for "celebrities" and you have an oblique indictment of even the most democratic system of government. The man who is not of an interventionist mentality, who is satisfied with self-domain and does not seek domain over others, who is not drawn to the seat of power like a moth to a flame, rarely has the time, inclination or plain bad taste to run for public office. And should he do so, he's rarely elected.

This viewpoint may prove too cynical for you . . . at present. A few years under NHI, PSRO and the rest of the Federal alphabet soup may well change your mind. The Federal machinery is gearing up to institute a health care system that has been proven time and time again to be more costly and less efficient than the current one. The current system is hardly faultless and it is unquestionably expensive, but it will only be hindered and debased by Federal intervention.

We shall have NHI and therefore I wish you good health in the coming years.

You're going to need it. ■

Alan E. Nourse *continued from page 5*

lobbyists, precious little has been done so far, and that only under pressure of desperation. The big question now is very simple: Are the physicians and medical institutions of this country going to dig in and use their good offices to make a National Health Insurance program work? Or are they going to wash their hands of it and let us stumble our way into a potential social and economic nightmare? There is some reason to hope that the former may occur. I worry about the latter.

Physicians and their organizations have been fighting the concept of government intervention—*any* kind of government intervention—into health care delivery ever since the late 1920s. Their opposition has been bitter, total, unyielding and adamant. In this respect there is little new in Dr. Wilson's statement except the details. National Health Insurance, he contends, is being foisted upon an unsuspecting populace by a few power-hungry politicians in some sort of unholy alliance with the mass media. There is no need for a government-controlled health care

delivery system, he says: health care is already just 17 minutes away from your doorstep. The health care that is available needs no political meddling to improve it: we have far fewer infant deaths per 1000 live births than the USSR. The cost of a National Health Insurance program would be extortionate, the delivery abysmal, and the notion that there should be independent review of the hospitalization practices, medical judgments and competence of our physicians is an intolerable affront to the world's most honored profession . . .

It's an old story, and we've heard it many times. But some see things in a different light. Let's consider a few points in more detail.

First, as to the pressures sweeping us toward a National Health Insurance program of some sort: It's simply absurd to contend that these pressures—and they are very great pressures indeed—are generated from the ambitions of a few politicians and a few newspaper and TV executives. Rather, they are arising from an enormous groundswell of outrage and indignation at the way health care is being dispensed, at the kind of health care being dispensed, and at its cost to the American family, particularly the American family that has no plausible means to pay for it. An important part of this groundswell is the slowly-but-clearly-emerging social and moral conviction that adequate health care should be the right of every citizen in this, the world's most prosperous nation, rather than a privilege reserved only for those fortunate enough to be able to pay for it. Equally important is the widespread anger and frustration occasioned by the staggering and apparently uncontrolled upward spiral of cost for even the most basic health care, combined with the growing fear of economic disaster facing any family afflicted with serious or prolonged illness. Whether any practicable National Health Insurance program we might evolve can truly meet these concerns and fears is a very good question indeed—but the concerns and fears exist, and there is no other scheme anywhere on the horizon that might conceivably meet them.

It is factors such as these, rather than the ambitions of a few politicians, that make some form of National Health Insurance inevitable in this country in the very near future. Dr. Wilson to the contrary notwithstanding, there are multitudes—*millions*—of poverty-level Americans who have virtually no health care available to them at all except in the most extreme emergencies, if then. They may *perhaps* get Emergency Room attention somewhere if somebody stabs them on the street—perhaps—but for those living out their singularly short everyday lives in the inner-city ghettos of the North or West, or in the rural ghettos of the South, or in lifelong grinding poverty anywhere else in the nation, for those living with diseased teeth, diseased lungs, diseased livers, diseased minds, there is nowhere to turn for medical aid.

Only somewhat less tragic are

the even greater multitudes of low-to-middle-income Americans who regard any kind of health care as an unwelcome economic burden, to be called upon only if they are absolutely driven to it by illness or injury, but who will shun it any other time and thus rob themselves of the very real benefits—including far better general health and lower overall cost—they might enjoy from a rational program of preventive health care. They will buy the automobiles and TV sets they regard as desirable necessities and turn their backs on the services they mistakenly regard as undesirable and too costly. And even the medical institutions that should know better work to perpetuate this tragically foolish state of affairs. Blue Cross programs, for example, will pay out *billions* in benefits to bail out the victims of heart disease, hypertension or cancer when they finally fall apart, but they pay *not one cent* for preventive medical maintenance.

As to the quality of care available under our present non-system, much depends upon who is providing it, who is receiving it and who is paying for it. We have at our command in this country the most advanced medical technology in the world, the finest medical minds, the most progressive facilities. We also have physicians who have been practicing medicine without interruption for the last sixty years without once opening a textbook or journal or submitting to an examination since they were first licensed to practice, sometime back during the administration of Woodrow Wilson. It's insane, but there you are. Dr. Wilson informs us with pride that we in these United States of America have only 19.8 infant deaths per 1,000 live births compared with 28 per 1,000 in the USSR. I submit that in the most prosperous nation on Earth, with medical technology unexcelled anywhere on the globe, an infant death rate of 19.8 per 1,000—*one dead baby out of every fifty born*—is simply appalling. To break that figure down along ethnic background and family income lines would be even more appalling; just talk to any large-city Maternal and Child Health Department official. There aren't many dead babies from white Anglo-Saxon Protestant families with incomes exceeding $15,000 a year. Not many at all.

Cost? The cost of health care in this country, for those who can afford it, is already ghastly, and the fact that medical dollars today can buy enormously more sophisticated medical services than ten years ago is small comfort: the cost is still ghastly. And Dr. Wilson is dead right: the cost of an across-the-board National Health Insurance program is going to be even more ghastly. Government has never yet learned to run an efficient shop. There's no conceivable reason to expect it to do so here, and the additional cost is going to hurt. Any wage-earner foolish enough to imagine that the government is going to provide him with "free" medical care will soon enough be disabused: if it doesn't come out of his paycheck, it will show up in his grocery bill, just as sure as—well,

taxes. What will happen, of course, will be a redistribution of wealth in terms of health care services, with the rich footing the bill for the poor. It's not a new concept; nor is it a particularly efficient concept, as far as health care delivery is concerned, because many, many precious dollars will be dribbled away to "administration"; but it's a concept that might—repeat, *might*—meet some of the desperate health care needs that exist today.

Indeed, in many ways the sort of across-the-board National Health Insurance program that is evolving here today could be a lemon. It could prove to be *ungodly* costly. It might not, after all, bring about the improvement in quality and availability of health care in this country that is really needed. It could very conceivably estrange a great many doctors who have been working their hearts out trying to make the old non-system somehow work, and it could very easily impose an insuperable barrier to the one-to-one relationship of doctor to patient that contributes so much to what really *is* good about the health care delivery we already have. It could also introduce government control into certain aspects of our lives that we may very well not want the government mucking around in: such areas as individual privacy, eugenics, genetic engineering, mandatory conception control, euthanasia, to mention but a few. We must recognize, however, that *these things are not yet inevitabilities.* The concept of a National Health program is still fluid. The mold is still plastic. We as informed individuals, doctors and laymen alike, have the power to influence the ultimate shape of it all—if we will. We can walk away and let it evolve into a real horror, or we can contribute and help mold it into a workable, if imperfect, program for real social reform.

The matter of Professional Standards Review Organizations (PSROs) is a splendid case in point. Most physicians—myself included—regard the establishment of these review boards as anathema. They threaten the doctor's professional prerogatives—that is, they threaten to tell the practicing physi-

IN TIMES TO COME

The John W. Campbell Award for the best new science fiction writer of the year was shared, at last year's World SF Convention, by Lisa Tuttle and Spider Robinson. Both of them have stories in next month's issue.

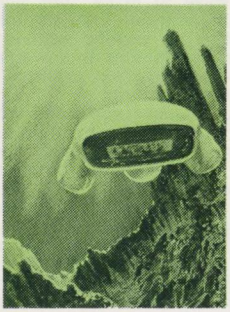
The lead novelette, "The Storms of Windhaven," is a joint effort by Lisa Tuttle and George R. R. Martin (who started writing too early to be eligible for the Campbell Award). And Spider brings us back to Callahan's Bar in "Two Heads Are Better than One." The cover painting for "Windhaven" is by Jack Gaughan, and shows one of the best sea monsters we've seen since Nessie.

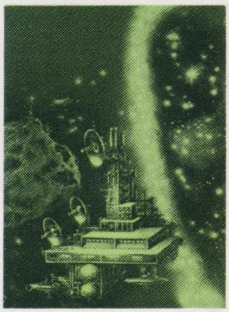
The science article, "Turing Point," by Thomas A. Easton, describes what may fairly be called the world's first intelligent computer. Not only is it intelligent—it is insane!

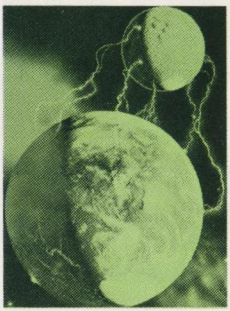
cian what he can and cannot do in the treatment of his individual patients, backed by the force of law. They threaten to establish inflexible standards to control what must necessarily remain the most flexible of all the humane and scientific arts—the diagnosis and treatment of human illness—an area in which everything, but *everything,* varies. They threaten to place laymen in the position of judging, perhaps even directing, the physician's professional behavior; and they threaten the sanctity of the physician's medical records.

In short, in many ways the PSRO amendment is a bad scene for doctors and patients alike—a real lemon—and there are certain indications that the people in government charged with administering this program are beginning, rather belatedly, to recognize that fact. Nevertheless, for now it is the law of the land. For now, at least, PSROs with all their potential threats are in fact being established. In this process, local and state medical organizations and individual doctors across the country are being asked, indeed, *urged,* to contribute to the way they are established and operated. And in some areas, doctors are turning their backs and walking away.

There is no need for PSROs to evolve into bureaucratic monstrosities unless doctors allow them to. There is no reason that a National Health Insurance program of some type cannot meet the health care delivery needs of this country, if not with the greatest efficiency, then at least with privacy, compassion and abundance if informed citizens, doctors and laymen alike, will work now to help mold the laws. But the nightmares will surely come if we turn and walk away. ■







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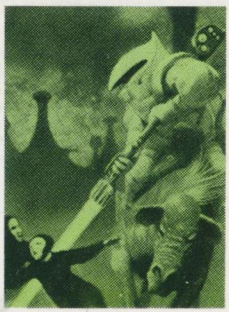

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