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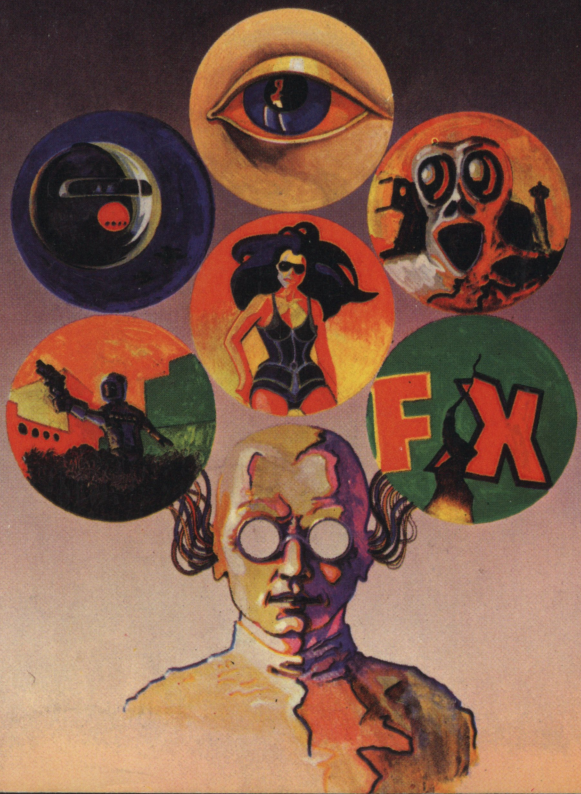
NEW WRITINGS IN SF-16

EDITED BY JOHN CARNELL



NEW WRITINGS IN SF–16

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Stories of man's experiment with man —and of the illusions that turn mind into matter . . .

NEW WRITINGS IN SF–16

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edited by John Carnell

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New Writings in SF–16

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DEDICATION

In affectionate memory of
JOHN BEYNON HARRIS
better known to s-f readers as
JOHN WYNDHAM
1903–1969

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FOREWORD

by

JOHN CARNELL

SINCE the previous volume was prepared a number of highly complicated and intricate space experiments have taken place. Apollo 8 round the Moon—undoubtedly the greatest technological achievement to date; the Russian Soyuz 4 and 5 link-up of capsules, considered to be the forerunner of a space platform; the successful Apollo 9 experiment in preparation for Apollo 10 round the Moon again. In fact, space-flight now happens faster than publishing and Apollo 11 and man-on-the-Moon should be an accomplished fact before this volume is in print. Let us not forget, however, that vast teams of experts in all fields go to make up the end result or that each experiment becomes that much more hazardous, despite the technological perfections built in by the scientists.

All this was queried by a newspaper reporter I met recently at a science fiction convention, who asked, "Surely, now that science has caught up with science fiction, there isn't anything left to write about?" The same question has been put by laymen for the past twenty years, overlooking the fact that science fiction was pioneering space-flight nearly half a century ago. Pioneering the *thought* and the possibilities of space platforms and journeys to the planets and predicting almost all the advances the sciences have made and contributed to today's modern world. The scientists may be one jump ahead of the authors now but the vast panorama of the future still remains an inviting blank page in an open book for writers to extrapolate possibilities.

The concepts in science-fiction stories have certainly gone

a long way past the first steps in space, as the three major novelettes in this volume show, dealing with "deep space" problems which Man will not be able to tackle for a long time to come, unless mechanical probes are used first. Christopher Priest's "The Perihelion Man" is the closest to today, centring round the problem of Man's frailty in relation to the Sun's heat and the hazards we face when we go to the inner planets.

In direct contrast, Colin Kapp's "Unorthodox Engineers" face problems almost (but not quite) inconceivable by earthly standards in which revolutionary thinking is necessary to solve the mysteries of a planet which does not conform to earth norm at all. "Getaway From Getawehi" is a fine choice of titles. Then there is James White's story "Meatball", the odd name given by the "Sector General" hospital doctors to the planet Drambo, which in itself is a sentient entity, or number of entities. How do you cure a living planet at war with itself?

It was coincidence that our major stories were galactic in scope, as they had already been selected before Apollo 8, but you will find that the short stories balance out the overall contents. Psychology in Michael G. Coney's "R26/5/Psy and I", matter-duplication in Douglas R. Mason's "All Done By Mirrors" and the decline of literature in a world of telepaths in Sydney J. Bounds' "Throwback".

Despite the scientists' achievements, there are still a great many new ideas left to the science-fiction writers—and I have no doubt they will be appearing in future volumes of *New Writings in S.F.*

JOHN CARNELL

April 1969

GETAWAY FROM GETAWEHI

by

COLIN KAPP

The Unorthodox Engineers face their most complicated problem to date—a planet where nothing conforms to Earth norm; where even twice one only equals one point five zero seven eight!

GETAWAY FROM GETAWEHI

ONE

"COLONEL NASH has just checked out of the spaceport, sir. Says he'll be with you in about half an hour. He's bringing a Commander Brumas with him."

"Coming to see me?" Colonel Belling cast a thoughtful glance at the wallclock. "He didn't happen to say what he wanted?"

"No, sir." The Port Liaison Officer was apologetic. "But he was in one hell of a hurry. The Navy virtually comandeered the field to give the ship priority clearance to land. They even used heat-shielded tenders to start offloading passengers before the pit was halfways cool. Looks like some sort of emergency. It's not often they risk landing a heavy cruiser at a metropolitan spaceport."

"A heavy cruiser?"

"Navy craft—one of the biggest. The Labship *Tycho Brahe*, no less."

"Was it in trouble?"

"Not apparently. But I think Colonel Nash was. When the Port Marshal went out to meet him off the tender the Colonel shouted 'Get away!', or something like that, and ran up the walkway like he was jet assisted."

"Thanks for calling." Belling cut the connection to the spaceport and turned back to the wallclock speculatively. Then he picked up the handset again.

"Duty room ... Is Lieutenant Van Noon still in the depot?"

"Yes, sir. But he's due to check out in a few minutes on twenty-one days leave."

"Stop him. He's not to leave without my personal author-

ity. Put him under arrest if necessary, but don't let him go."

"Understood, Colonel. What's the charge this time?"

"No charge. Just hold him until I send for him. I have a slight feeling that Colonel Nash isn't the only one who's going to be in trouble."

"Glad to see you, Ivan!" Belling held out his hand. "You know, I haven't seen you since you went to Tazoo."

"Tazoo?" Nash mopped his perspiring brow. "I wish to hell I was still on Tazoo."

"Oh? I gathered it was a bit of a hell-hole."

"The galaxy's worst—or so I thought. But that was before I came across Getawehi."

"Getawehi? What's wrong with Getawehi?"

"That's just the problem," said Nash, with a look of resignation. "I'm damned if I know what's wrong with Getawehi. I can't even talk about it without sounding irrational. That's why I asked Commander Brumas along. He's handling the Navy's side of the Getawehi project and a saner man you couldn't wish to meet. He doesn't find it easy to talk about Getawehi either. For that reason he's come armed with a taped record which shows some of his peculiar problems. I think he'd better state his case first."

"You have me intrigued," said Belling. "The entire resources of the General Engineering Reserve are at your service. If you can broadly define your problem, I'll call up one of our specialists who may be able to assist."

"Forget your specialists," said Nash heavily. "Get that nutter Van Noon up here. This is the type of outwards-facing-interior problem that only he knows how to handle."

"You know," said Belling, "I had the feeling this was going to to be one of those days as soon as I heard you were coming." He reached for the handset again.

"Duty room . . . Is Van Noon available?"

"Yes, sir. Under close arrest. He had to be restrained from leaving. Do you wish to enter a charge sheet?"

"No. Just get him up here fast. And while you're at it, drop a noose over Sergeant Hine and the rest of the UE squad. I have a feeling we may be lucky enough to be rid of the whole damn lot by morning."

"You sent for me, sir?" Lieutenant Fritz Van Noon entered the office cautiously.

"Yes, Fritz." Colonel Belling motioned Van Noon towards a chair. "Sorry to have to cancel your leave, but something very important has come up. Colonel Nash you already know, but I want you to meet Commander Brumas, currently heading the Navy's Space-Engineering Research team. He has an emergency on his hands." He turned to his visitor. "Commander, this is Fritz Van Noon, who runs our Unorthodox Engineering group."

Despite his obvious agitation, the naval officer relaxed somewhat at Fritz's entry. He had evidently found Colonel Belling's approach to his problems no more comforting than those of his own Service authorities.

"What's on your mind, Commander?" asked Van Noon.

"Getawehi." Brumas said it with the air of a man who has repeated a story so many times that he is sure that by now the whole world must be familiar with its details.

"Getawehi? Sounds like an insect repellent."

"No such luck. It's a planet and one of the most Godlost territories in space. We've a twenty-man construction team trapped down there, and we can't lift them off."

"And you think the Engineering Reserve might be able to help you?" Van Noon shot a quick look at Colonel Belling —who was apparently finding some innocent amusement in the ceiling, to judge from the expression on his face and the elevation of his eyeballs.

"Not the Engineering Reserve," corrected Brumas sharply. "Specifically the Unorthodox Engineers. The other kind we already have, but after exposure to Getawehi problems they tend to go down with nervous breakdowns like they were infectious. No, this is a far-out situation, and

it's going to take some intensely screwball ideas to solve it."

"Then you're on to the right person," said Belling maliciously.

"Exactly what's so special about Getawehi?" asked Fritz.

Brumas mopped his brow. "Let me give you the background first. There's a big joint-service science project called Ixion on at the moment. The Navy's part was to land and assemble an equipment project on Getawehi. Superficially it seemed a simple job. It proved to be the biggest balls-up in Naval history. Not only have we been unable to complete the assignment, but we've also lost most of our equipment and left our construction team stranded on Getawehi. If we can do nothing else, we have at least to find a way to get the team off."

"I don't quite see what the UE group can do that Space Rescue can't."

"No—but then you haven't been to Getawehi. The whole planet's a rotten cosmological joke. Everything about Getawehi is sideways-up. From its orbital velocity and apparent mass it has no business even being in its present orbit around its primary, Geta. And not content with being a complete mathematical absurdity, its own rotation is subject to such peculiar perturbations and variations that its progress can only be described as lolloping. It doesn't even have a stable period of rotation."

"You must appreciate I'm supposed to be on leave," said Van Noon warily.

Brumas was unswerving. "But it's only when you take a closer look at Getawehi that the real peculiarities of the planet begin to emerge. Take, for instance, the dance of the drunken rocket."

Van Noon looked appealingly towards Colonel Belling, but the latter avoided meeting his eyes and busied himself with loading the videotape projector.

The screen brightened to show a stereo close-up of the planet's surface, a view obviously taken from a spacecraft

in a precarious synchronous orbit. Under the cameras the terrain of Getawehi was nothing remarkable. On the screen an ashen-grey soil, spotted with wisps of heather-purple fern and palmaceous grasses, gave way reluctantly to the edge of a grey, rock-strewn steppe—a typical patch of ecological poverty in the cosmological scheme.

"This is the spot," said Brumas, "where the first team made touchdown. The prognosis was favourable. Getawehi had a breathable atmosphere at tolerable pressure, no predatory animals above the size of a mouse, and temperatures well within the range of working suits."

"I've still got twenty-one days due to me," said Van Noon plaintively.

Brumas ignored the interruption. "I'm replaying the recording at ten times its actual speed, so that the effect will appear exaggerated. What you will see is only one example of the kind of tricks that Getawehi has up its sleeve. In a few moments you will see the landing of the ferry rocket. At this playback speed the actual transit time will appear quite brief, but we are mainly interested in what happened after it landed."

The actual moment of touchdown was obscured by a swiftly-subsiding dustcloud, which cleared to show the rocket standing firmly on its landing legs but leaning at a decided angle from the vertical.

For the first time, Van Noon began to take an active interest.

"Odd!" he said.

"It gets more odd the farther it goes," Bruma assured him. "As a matter of interest, it's the only ship we've been able to put down without it toppling. Not that *that* did very much good."

From the vantage point of the camera almost vertically overhead in space, the legs of the rocket could be seen to be firm, but the angle at which the nose-cone faced the sky changed direction and deviated in angle in the most alarming way.

"At this point we assumed," said Brumas, "that what we were observing was the failure of one or more shock-absorbers on the legs, and a hunting pneumatic servo trying to compensate. But it isn't true."

"No," said Van Noon. "I didn't think it would be."

"What makes you say that?"

"The rocket's centre of gravity. Even with a weighted base—which you haven't got on a ferry rocket—you couldn't lean it at that angle to the vertical without it falling over."

"Very good!" approved Brumas. "So what's your reaction to that little paradox?"

"I feel sick."

"I mean seriously . . .?"

"I was being serious. If the rocket hasn't toppled it can only be because its centre of gravity hasn't been greatly displaced by the angle at which it's leaning. There's only one set of conditions where that would be possible."

"Which is?"

"That the gravitational attraction of Getawehi is not perpendicular to the surface of the planet. On Getawehi, 'up' is not only angled from the geocentric vertical, but it's even subject to short-period changes of direction."

"This boy's brilliant!" said Brumas, glancing at Belling. "Now, Fritz, leaving aside the fact that gravity variations on that scale are a physical impossibility, let's see how you do on the next bit."

"You mean there's more?"

"I haven't started yet. This is only by way of introduction. You name the impossible, and Getawehi has it."

The nose-cone of the rocket swung to encompass three hundred degrees of arc in as many seconds, then the whole space vehicle gave a skip and a stagger, spun completely about on one landing leg, then re-established itself about a ship's diameter away from its original position.

"Ingenious!" said Fritz Van Noon.

"Isn't it? I thought you'd be intrigued. But the worst is

yet to come."

Having found its legs, so to speak, the rocket adopted a fairly rapid series of gyratory steps while miraculously remaining approximately vertical. Its path was increasingly haloed by a ring of escaping crewmen, like frenzied ants encircling a honeypot. Each step the ship took was preceded by the curious hop-skip motion with which it had preluded its new mode of transport. Its continuing drunken dance through the fern banks soon carried it out on to the edge of the steppe. There it abruptly disappeared from view except for an unmoving brown stain.

Brumas swore and stopped the projector. "Sorry about that! I'll give you that last sequence again at true speed."

"It might help," said Van Noon morosely. "An inebriated rocket I could learn to live with, but I know from bitter experience that the abrupt removal of half a billion credits of Government money invariably needs a good explanation."

After a brief interval the rocket re-appeared, moving now at its actual speed and engaged in the last of its strides through the fern and out on to the plain. The extreme angle of its tilt was clearly visible, and its last swivel-round was remarkably controlled considering the vehicle's thousand tonne Terran deadweight.

As the landing carriage touched the plain's edge, one leg folded beneath its burden. The rocket tipped sideways and began to fall. But more than falling, the whole ship appeared to dissolve as it toppled, the debris melting like candlewax dropped on a hot stove. There was a brief flare, scarcely visible in Geta's strong sunlight, then there was nothing left of the vessel save for a large area of brown metallic stain on the sand-ash and a few chunky ceramic tube components which survived the remarkable fate of the rest of the ship.

For a long time Van Noon was silent. Then finally he spoke.

"That was quite some trick," he said. "How's it done?"

"I'll go into that later," said Brumas. "Right now the point at issue is that we've a job to do on Getawehi—a job we've started but can't finish. We've three supply ships orbiting the planet which we daren't instruct to make planetfall for obvious reasons. And we've a twenty-man construction team stranded on Getawehi which we can't lift off. We've had a hundred per cent mortality rate on transfer ferries attempting touchdown, and we can't even communicate with the ground force except by line-of-sight laser channel, due to radio interference."

"All of which adds up to one heck of a problem," said Van Noon.

"Precisely!" Brumas and Colonel Nash exchanged glances. "But as I said, this is only the introduction. Colonel Nash is the one who has the real problems."

Two

THE thunder died as the Labship *Tycho Brahe,* having cleared the necessary seventeen thousand astronomical units, transmuted easily into its hyperspace analogue and fled through the weird corridors of the dimensionless continua. Aboard, it was time for relaxation. Navigation towards Geta held few of the problems of astronavigation which would have complicated the reaching of a star within the confines of the Milky Way. Far out from the edge of the Galaxy, where the great tides of emptiness washed against the brave Rim stars, the farther galaxies hung like incredibly distant islands in an ocean of darkness. In the intervening void, a million light-years from anywhere, one solitary star formed an unmistakeable beacon in the emptiness of space. This was the primary Geta, a cosmological odd-man-out, jealously nursing its wilful satellite, the lone planet called Getawehi.

As the vibration of the planetary drive faded from the fabric of the ship, Van Noon forsook the computer and traced his second in command to the radio room.

"Colonel Nash wants to see us, Jacko. At last we're going to get a briefing on Project Ixion."

Jacko Hine was not impressed. "If it's all the same to you, Fritz, I'd rather get off here and start walking home. The more I learn about Getawehi the crazier it all becomes."

"Why? What's the matter now?"

"I've been checking the recordings to see why Brumas thought it necessary to use a laser channel to communicate with the ground force. I found the answer. In addition to an enormous magnetic field. Getawehi has an output of radio mush which exceeds that from Terra by about nineteen hundred to one."

Van Noon stopped abruptly. "Synchrotron emission or static?"

Jacko dropped the wire spools on the table. "Neither. Modulated carrier waves. There's no doubt of it. Long waves, short waves, v.h.f., u.h.f., and damn nigh into the X-ray band. You name it, and Getawehi has it. And some of those transmitters pack a punch which would make a Terran megacast station look like a spark transmitter."

Van Noon began to look rather grey. "But there can't be any such transmitters on Getawehi. Hell, Jacko, it's uninhabited. There's no life form on Getawehi with an intelligence much above a jack-rabbit. So who's doing the broadcasting—ants?"

"I wouldn't know. But I can say that the radio output from the surface, mainly broadband carriers modulated by random noise, constitutes an almost perfect radio blanket."

"But it's damn ridiculous! Radio galaxies I have heard of, but what the heck am I supposed to make of a radio planet? It can't be a case of synchrotron emission, because you don't get that sort of electron energy on a habitable planet. Anyway, it wouldn't give you a modulated carrier.

But what's left? Nothing much less than an array of conventional transmitting equipments—which is impossible—and even if it weren't, you'd still need power to get that sort of output. You can't get that by rubbing two pieces of lichen together."

Jacko smiled ruefully. "It makes a change to hear *you* condemn something as impossible. What's happened to the spirit of sweet unorthodoxy this morning?"

"It's gone a trifle sour on me. Hell, Jacko, Brumas has a ground crew down there. If there were big radio transmitters on Getawehi they'd surely have investigated them by now. So where's their report?"

"There wouldn't necessarily be a report. Communications between ground and the spacewatch have been rather sparse."

"But why? With a laser channel in operation they could have a thousand-way circuit in operation if they chose."

"Except for one thing. A reliable line-of-sight channel presupposes the space end of the transmission to be in a synchronous orbit. But you can't establish a synchronous orbit around something which lollops about in space like Getawehi does."

"I take your point," said Van Noon wearily. "We've just been trying to get some sense out of Getawehi's peculiar rotation scheme. The computer keeps throwing it back requesting further information. We can't find any set of postulates which goes halfway towards meeting the facts."

Jacko stood up. "You know, Fritz, I've followed you into some pretty crazy situations in the past few years. But from the way things are stacking up I have the premonition that Getawehi's going to be the craziest yet."

"And I've a horrid suspicion you're right. No planet is entitled to be as crazy mixed-up as is Getawehi. Even that self-disposing rocket was a highly unusual bit of do-it-yourself. Let's go see what gives with Project Ixion. If it's half as mad as Nash is suggesting, you're going to have company on that long walk home."

Colonel Nash looked up from a report-strewn table as Fritz and Jacko entered. He was obviously not looking forward to the interview.

"Sit down, gentlemen. You've no doubt wondered why I've left it this late to introduce you to Project Ixion. Frankly, it's because we've all been hoping that somewhere down the line there's been a ridiculous mistake. But I'm afraid our last analysis leaves us no such get-out. The improbable is absolutely true."

"Exactly what is Project Ixion?" asked Fritz.

"I'm only an engineer," said Nash. "I don't pretend to understand the theoretical work behind it. It has something to do with determining the possibility of borrowing entropy levels from other parts of the universe. If it could be done, it would place at our disposal almost limitless sources of power without having to expend any of our own resources."

"That I can see," said Fritz. "But why do it on Getawehi?"

"Theory suggested Getawehi as an ideal testbed for the experiment. Geta and its planetary satellite are so far removed from any galactic grouping that they effectively form a miniature galaxy of their own—a universe of two. Freedom from massed stars was something which the experiment demanded. From the theoretical standpoint there's no place in space quite like Getawehi."

"Amen!" said Jacko.

"So what's the problem?" asked Van Noon.

"The Ixion Project consisted of assembling two substantial prefabricated structures on Getawehi. One was a large turntable, and the second was a cantilever dish, which should have mounted on the turntable roughly after the manner of a steerable-dish radio telescope."

"So?"

"So this . . ." Nash threw a clip of message forms across the desk. Fritz picked it up and read speculatively.

GETAWEHI GROUND FORCE . . . TO NASH . . . TYCHO BRAHE . . . YOU OLD IDIOT . . . QUITE APART FROM OUR RIDICULOUS CONFINEMENT . . . MUST INFORM YOU NO UNCERTAIN TERMS THAT NO REPEAT NO PART OF IXION TURNTABLE CAN BE ASSEMBLED FROM PARTS PROVIDED . . . YOU MUST BE MAD . . . EXCLAMATION . . . WOOLEY . . . COMMANDING.

Van Noon turned to the second page and read on.

WOOLEY COMMANDING GROUND FORCE GETAWEHI . . . ASSURE YOU ALL PARTS IXION ASSEMBLED AND TESTED ON TERRA BEFORE TRANSHIPMENT . . . TRY HOLDING PLANS RIGHT WAY UP . . . NASH . . . TYCHO BRAHE.

Colonel Nash shifted his chair uncomfortably.

GETAWEHI GROUND FORCE . . . TO NASH . . . TYCHO BRAHE . . . NO PART OF TURNTABLE FITS EVEN WITH PLANS HELD SIDEWAYS . . . IMPOSSIBLE THESE PARTS EVER ASSEMBLED INTO ANYTHING ANYWHERE . . . YOU MUST BE JOKING . . . WHY DON'T YOU RESIGN QUERY . . . WOOLEY . . . COMMANDING.

Van Noon passed the first sheets to Jacko and continued reading.

WOOLEY COMMANDING GROUND FORCE GETAWEHI . . . SORRY TO LEARN OF YOUR NERVOUS CONDITION . . . AM ACQUIRING COMPETENT ENGINEER AS REPLACEMENT SOONEST . . . SUGGEST YOU AVOID ALCOHOL IF YOU CANT HANDLE THAT EITHER . . . NASH . . . TYCHO BRAHE.

There was one final sheet, which read:

GETAWEHI GROUND FORCE . . . TO NASH . . . TYCHO BRAHE . . . ALCOHOL YOU D . . .

The rest of the signal was certified as corrupt by the Signals Officer, but he omitted to indicate whether the corruption was semantic or technical. Van Noon looked up.

"So who was wrong?" he asked.

"Nobody," said Nash. "I saw the completed Ixion structure on Terra and it checked out to specification. It was dismantled and crated by Wooley's own team. The parts space-dropped on Getawehi were one hundred per cent accurate."

"But he says . . ."

"I know what he says—and this is the paradox—I happen to believe him. Wooley's a hell of a good engineer. If he says the parts don't fit, then they don't fit. It's not a question of personalities or expertise. It's simply the fact that something built on Terra will not re-assemble on Getawehi. Don't ask me why."

Fritz considered this in silence for a while. "That takes a bit of swallowing."

"I know. That's why I asked you to come. You specialise in impossibilities—well here's another one for you."

"What do you want me to do?"

"Do? Brumas wants the construction team rescued from Getawehi. Naturally that's the first priority. But knowing the way you do things, I want you to go one step further. I want you to go down there and finish Ixion itself."

Van Noon examined his knuckles. "That may not be easy. This is a joint Service exercise with divided responsibilities. What sort of backing and resources can I count on?"

"I had a notion you'd ask that. Commander Brumas and I took the precaution of clarifying the position with GenCom. You must have friends up there, because their answer was unequivocal. As from the moment of this interview you are appointed Senior Adviser for the whole Getawehi–Ixion project. All units involved will take their instructions from you. Nice work, Lieutenant! As from this instant it's all your show."

With a thunderstruck expression, Van Noon shook the offered hand.

"Seriously?"

"Seriously. There's far too much money invested in this enterprise and far too much to gain to let it fall now. Frankly, this is a vote of confidence in unorthodoxy."

"Very well!" Van Noon turned to Sergeant Hine. "If you can manage to get your mouth closed, Jacko, we've got work to do."

"Like what, Fritz?"

"Like beating the daylights out of the computer, for a start. There must be some reason why that damn planet lollops all over space like that. And unless we can come to grips with the problem I'd guess we're in for a pretty rough landing."

Two days later, standard shipboard time, the *Tycho Brahe* quit hyperspace with a delicious quiver and proceeded on planetary drive to the rendezvous. In high orbit three supply ships circled the innocuous-looking mudball of Getawehi, while far below the solitary pinnace rode the lower circuit making a precariously bad job of maintaining a synchronised station above the ground base. Around them the fiery orb of Geta seemed to trace her possessive path as if guarding her solitary ugly-duckling of a planet. In all other directions the bare inkyness of the great void, shorn of the comforting beauty of individual stars, glowed with the light of a thousand million galaxies. And in one of these, one of countless millions of stars combining to form a solitary visual group, was an unexceptional primary called Sol—one of whose planets nursed the upstart blobs of protein called men who were daring to make space their own.

When the rendezvous was complete, Van Noon abandoned the computer for a telescope and found the results equally uninformative. From any angle of offworld approach, Getawehi refused to deliver up its secrets. Super-

ficially it was a sparsely vegetated, rather uninviting ball of rock and earth. It had never achieved a life-form capable of developing any degree of civilisation and seemed content to go rolling perversely through space until the stars grew cold. Its only claim to activity was on the radio-frequency bands, where its output, inexplicably, was both prodigious and impenetrable.

Jacko watched the pencil being fractured by Fritz's powerful fingers.

"So how're we going to play it, Fritz?"

"I'm not sure yet. We don't seem able to gain any meaningful information from up here, so we'll have to go to where it's all happening."

"To Getawehi? So far they've wrecked every ferry rocket they've sent. Were you thinking of taking the whole UE group?"

"Not initially. Just the two of us, if you're game. I need to get down there to get the feel of the place."

Jacko shrugged. "I've got a pilot's licence, but in the circumstances I make no guarantee about the quality of touchdown."

"That's understood, Jacko. If you can get us down without any broken bones, it'll be the best we can expect."

"Brumas isn't going to be very happy. He's lost too many ferries already."

"He'll be a lot less happy if he goes back to Terra minus his ground crew. Frankly I don't see any alternative. Down there we stand a chance of doing something constructive. With the rest of the UE group still spaceborne we've at least hedged our bets."

"What sort of equipment do you want to take?"

"Just light-engineering kit. If we need anything special they can do a spacedrop."

"Assuming we can get into contact."

"Wooley has his laser link down there, but the thought comes to me that if we can get control of one of those

super-power transmitters down there, the communications problem should be over."

"That's the bit that has me worried, Fritz. Where the hell are these transmitters? There's not a sign of them in the telescopes."

"I scarcely expected to find equipment shacks and antennae laid out in a row. Let's face it, Jacko, we're playing in a pretty weird sector of the universe. We're up against so many unknowns that we'd be lucky to recognise a dog before it bit us."

THREE

"CAN'T you hold her, Jacko?" Van Noon was watching anxiously through the ferry viewports as the ground details of Getawehi grew more specific and less stable with their continued descent.

"She's beginning to fight the automatic control system. The inertial guidance platform says that Getawehi is directly under, while Getawehi's gravitation says that it's sideways."

"So who's right?"

"Both and neither. It's all a matter of relativity, but it does raise complications. To exaggerate slightly, imagine trying to land a ship on a ramp angled at forty-five degrees from the horizontal. Do you approach at a true right-angle to the surface of the ramp, or do you follow the geocentric vertical?"

"Which way's softest?"

"Either way you're in trouble. If you choose the first, you're liable to topple. If you choose the second you're liable to skid down a one-in-one slope on one landing pad. Throw in the fact that your ramp is not only inconstant in angle but also varies in direction, and you have a rough idea of the dilemma facing both myself and the ship's computer at this moment."

"What happens if we remain controlled by the inertial platform?"

"We crash."

"What happens if we cut the automatics and try to achieve Getawehi's conception of the vertical?"

"We might just make it, if we conserve fuel and don't apply the corrections until the final moment. Only one problem—we don't know what Getawehi's conception of the vertical is. Even with the best of luck we're bound to come down askew on some parameter or other."

"Gyp the automatics and fall by line-of-sight for a while."

Jacko mopped his brow. "Right. I'm cutting all automatics except the stabilisation gyro. We'd have had to do that sooner or later anyway. A small craft like this doesn't have enough fuel to make course corrections on a continuous oscillatory basis."

Van Noon took up station by a viewport and watched the wildly plunging horizon with some dismay. "How far are we aiming to land from the base camp?"

"Under these conditions I couldn't guarantee any position within a twenty kilometre radius. I'm heading far out so that we don't risk putting a jet burn across the camp. The camp's at the foot of the valley, and I'm aiming to come in between those two mountain ranges, about halfway up the pass."

The rising scream from the ferry's outer skin told them of their entry into Getawehi's atmosphere. The laser altimeter raced suddenly alive and began to count down the distance to the surface, acknowledging Jacko's gentle application of the retro-rockets. Through the viewport the horizon spun wildly and disappeared from view. Fritz took one look through the opposite port at the alarming prospect of Getawehi approaching sideways-on, then ducked back to Jacko at the controls.

"If you call that a line-of-sight approach, we'd best go back for an optician."

Jacko took his hands from the controls momentarily. "If

you think you can hold this she-devil in control any better, you're perfectly at liberty to try."

The success of this impromptu manoeuvre was dramatic. The ferry immediately ceased its wild swinging and settled into a more restricted pattern of deviation from the geocentric vertical. Jacko looked at the controls in considerable amazement.

"I don't get it!"

Van Noon thought for a moment, then his lips twisted into a grin of amusement. "I think I do. Both line-of-sight and inertial guidance are related to the geocentric vertical. All we did was substitute your reactions for those of the automatics. But we were wrong. All we have operating now is a simple stabilisation gyroscope. Don't you see what that means?"

"No."

"Where does the axis of a gyroscope point?"

"Near a planetary mass? Towards the centre of gravity if it's halfways orientated from the start."

"Precisely! And since Getawehi's gravitational centre is not a fixed point, the gyroscope is swinging the ship to follow the gravitational drift. That was the tendency the inertial guidance system was fighting. But we don't have to fight it—the gyroscope is already giving us the factor we need. It's automatically correcting us to Getawehi's concept of the vertical."

Jacko was not convinced. He concentrated on the task of matching their deceleration to altitude, seldom allowing his hands to move more than a hairsbreadth away from the guidance controls. His caution was proved unnecessary. With a reserve of power still to spare, they continued safely to the point where they were ready to make a soft landing.

But the actual moment of touchdown brought disaster. By virtue of being orientated to Getawehi's gravitational direction, the ferry hit the ground at an angle. The landing mechanisms refused to accept the situation, and the leg

servos tried to force the ship to adopt a station at right-angles to the terrain. Such a stance was inconsistent with their centre of gravity. The whole structure staggered alarmingly and seemed likely to topple. Van Noon reacted fast, his hands instinctively bringing the fail-safe system into over-riding control.

"Bail out, Jacko! If this thing goes over it's going to do some damage."

Jacko needed no prompting. He hit the emergency release, and jumped as the hatch fell open. Within seconds they scrambled clear of the great bulk of the swaying ferry, and scarcely had they paused to gain breath when the vessel gave a skip and a grunt and toppled disastrously behind them.

Shorn suddenly of the ship walls, they looked at each other in amazement as the full experience of Getawehi's peculiar gravity became a physical reality for them. The first sensation was vertigo, the second, nausea. What had been uphill when they first made touchdown was perceptibly shifting until it became across-the-hill, and, even as they watched, became downhill. Fritz's natural body orientation changed with the shifting direction of "up", and the heavens swung around him in a great arc as he moved into equilibrium with the changing conditions.

"Interesting!" said Fritz at last.

"I hope it's not going to do that often. I expect it when I'm drunk, but cold sober it comes as a bit of a shock to the system."

"I know what you mean, Jacko. On Terra 'up' is up, and it's inclined to remain that way. On Getawehi 'up' not only varies in direction but also in slope according to what angle to the geocentric its gravity is pulling."

"But how the heck does that work?"

"I don't know, but I'll figure an answer to it soon. Of course, even on Terra there's a sight distortion of gravitational direction due to the pull of the moon—hence the tides. But it's so slight it can't normally be noticed. If

Getawehi had some extremely massive satellites, that could be a possible answer."

"Except that Getawehi hasn't got any satellites—none detected, anyway. And with the mass they'd need to produce an effect like that it would scarcely be possible to miss them."

"Mmm! We'll come back to that problem when we've had a chance to talk to Wooley's crew. In the meantime, consider the potential uses of a variable-direction gravity. Given a soapbox on wheels and decent set of brakes, you have all you need in the way of low-cost transport. You wait until your destination lies downhill, release the brakes and coast towards it. When your destination shifts uphill you drop anchor and wait."

"You couldn't run wheels over this stuff." Jacko kicked the soft ashy soil moodily.

"I wasn't thinking of it," said Van Noon. "That was purely by way of illustration. Something more in the nature of a sledge . . . to get us to the base camp."

"Moses!" Jacko turned back towards the fallen ferry. It was now a stiff uphill climb, and the ferry approached from the side, looked precariously unsafe. "I've just the thing, Fritz. The plastic cabin liners. Six sections meeting to form a dome. You couldn't have a better shape."

As he spoke the world seemed to rear perilously upwards, ship uppermost, as some new component of Getawehian gravity roughly doubled its field and threw the gravitational angle to something approaching forty-five degrees from the geocentric vertical. Standing now on a hillside plain which fell away below them in a one-in-one slope as far as the eye could see, they stopped in horror. The huge ferry vehicle, its weight now twice that on landing, crushed the soft ash-soil at the edge of the depression it had made for itself on falling, and began to roll murderously down upon them.

Their instinctive reaction was to turn and run down the monstrous incline in front of them. With rare presence of

mind Van Noon caught Jacko's arm and forced him to run a diagonal path which took them barely clear of the rolling tail fins as the rogue spacecraft rolled a deep trail in the ash-soil. The wisdom of Van Noon's diagonal path of escape was soon apparent. The rolling ship rapidly achieved a velocity which would have fatally outstripped a running man.

Then the angle of the terrain began to flatten again and the intolerable gravity lessened. The ferry rolled to a cumbersome halt as the incline down which it was moving became insufficient to support its motion. Finally the two unorthodox engineers trudged ironically up a slight incline after their errant vessel, approaching it from tail-on lest it should take it upon itself to roll again.

"Lesson one," said Jacko. "First catch your spaceship."

"We seem to be luckier than Wooley's ground crew. At least it hasn't dissolved on us."

'There's still time," said Jacko miserably. "The hatch is on the side. Dare we go in?"

Van Noon cast a wary look at the unstable skyline. "Not for very long. We don't know how often Getawehi goes in for a big pull like that. It'd be fatal to be trapped inside if it rolled again. What we really need is explosives to dig a real big ditch alongside. Once we got her into that we could work inside fairly safely."

"There's explosives in the tool hold."

"Do you know exactly where?"

"I stowed them there myself."

Fritz had been attempting to time the apparent rotation of the highest point of the skyline. Its movement was highly erratic, but there was a certain degree of progression. The coming angle was one soon to place the ship in a position to slip only noseward if it moved at all.

"When I give the word, you try to get in there and out again with the explosives in about seven minutes flat. If you hit trouble, get out without the explosives. But whatever you do, keep inside seven minutes."

Jacko nodded. When Fritz gave the signal he climbed swiftly to the hatch, fought the cover open, and disappeared inside. Van Noon spent an agonising seven minutes which lengthened into eight before a flurry of activity in the hatchway deposited a dozen packets of plastic mining explosive at his feet, followed by a box of detonators. It was ten minutes before Jacko himself got clear, having miscalculated the intricacies of manoeuvring in a space cabin with the gravitational attraction sideways on.

Van Noon was watching the shifting angle cautiously. He waved Jacko away urgently, but although the terrain began to slope in a direction which could have set the ferry rolling again, the angle did not become acute enough to bring the vessel into motion. Van Noon was quick to seize the opportunity. Mentally estimating the circumference of the vessel, he paced out the distance through which the hull needed to rotate in order to leave the hatch at the top.

They placed a chain of explosives across this distance line, with a one-minute detonator at the end. Priming the detonator, they ran across-hill to a safe distance and waited. The explosion ripped a long, deep trough in the soft ash, the edge of which reached almost to the ferry's hull. The shock of the explosion was just sufficient to overcome the forces which kept the great vessel from moving down the incline. Ponderously it rolled into the crater and settled, almost a third of its bulk below ground level.

Now they were able to work on the ferry with the minimum of risk, although the uncertainties of exactly what was "up" were peculiarly unsettling within the confines of the fallen ship. Time and again they were disturbed by the sudden fear that the hull was beginning to roll again, as some sudden change in gravitic direction or intensity made the "floor" apparently shift under them.

It took two hours to cut the cabin liners into sections suitable for two sleds. The shapes they obtained could scarcely have been more suitable for the purpose had they

been custom designed. The only brake they could devise was a crude foot-operated device like a ploughshare bolted on to angle brackets at the rear of the sections. On test the brakes proved savagely effective, but the failing light made them put away thoughts of starting their journey before morning.

Very few of the services in the ferry still worked. From the growing acridness of the atmosphere inside, it was obvious that the chemical powerplant had been damaged. For this reason Van Noon decided they would be safer sleeping in the open. They spent the remaining time before darkness removing from the ship various tools and such few items of provisions as could be carried on the sleds.

Night came with explosive suddenness. The night sky was the first tangible reminder of their peculiar extra-galactic location. The only luminous bodies in the crystal-clear heavens were the great galactic clusters, magnificent in their raiment of light but with a unique sparseness and complexity which underscored the alienness of their situation.

They scuffed shallow grooves in the ash-soil in which to settle their sleeping pods, then climbed in, anxious to get some rest to meet the demands of the coming day. Such was their trust in the ecological and atmospheric climate of Getawehi that neither thought to place their face visors over their pods to ward off precipitation or biological attack. Their only inconvenience seemed to be the shifting gravity, which imparted to the pods the feeling of movement, as if lodged in the branches of a vast and slowly-swaying tree.

It was two hours after Geta's rays had set that Van Noon was awakened by a startled cry from Jacko.

"Fritz!"

"What the devil's the matter?"

"Look at the mountains—they're burning!"

Van Noon aroused himself and followed the indicated line. Surely enough, whole sections of the ranks of distant hills were lit with a red glow of such intensity that the sky was saturated with a blood-red cast.

"What is it? A forest fire?"

"Damned if I know, Jacko. That range is best part of thirty kilometres away. It would need to be one heck of a forest fire to be clearly visible from here."

As they watched, the fire on the burning mountains seemed to shift and change with running patterns and pulsations, forming a spectacle more absorbing than the species-long pastime of watching the flickering heart of a home-fire.

"It doesn't look right," said Van Noon after a while. "Those currents in the flame are moving too fast and too regularly to be true. A forest fire is a set of small burning nuclei—individual conflagrations. But the way the flame out there flickers, it looks as if the mountain is burning *en masse*."

"Could it be volcanic?"

"Not the kind of volcanism we're familiar with. Anyway, there was nothing about the structure of the rocks by daylight which suggested volcanic action."

"So what's happening over there, then? Don't tell me the whole mountain is made up of paraffin wax?"

"Nothing about Getawehi would surprise me," said Van Noon moodily. "But there's one thing that worries me."

"What's that?"

"There's too much power about. Those burning mountains are a pretty powerful display of something—so is the radio output and the mixed-up gravity. They're all power manifestations of considerable magnitude. But it's always output, with never a sign of the origin. It's as if there's a very much larger force at work—a force so large that it can afford to spill over a few billion kilowatts as side effects and never notice the loss."

"I had the same idea. None of the demonstrations we've seen so far seem lacking for a few billion ergs. I'm not keen on the implications. If there is a large power source around, I like to know where it is and what it is. It helps to know if you have to get out from under in a hurry."

Getawehi swung "up" sideways, momentarily exerted a gravitational pull which almost broke their backs, then reduced its attraction to such an extent that their pods almost left the surface. There was another twist in gravitational angle, then the burning mountains, which had so far seemed to be up a slight gradient, slipped to the bottom of a racing slope of one-in-two. Then, as if to complete the performance, the burning mountains went out—like the turning-off of a lamp.

"You know, Fritz," said Jacko as he sank back into his pod, "Colonel Nash was right. There is no place in space quite like Getawehi."

FOUR

AT first light the next morning they had a trial run of the sleds. By reasonable guesswork their present position from the base camp was about fifty kilometres—an uncomfortable journey if made on foot over the soft ash. For direction they had only to follow the valley floor between the two mountain shoulders to a point where the mountains succumbed to the broad and rocky steppe, the edge of which had been the scene of the disastrous first landing by the construction crew.

To their delight the sleds ran easily over the ashy soil, even when presented with only slight gravitational gradients. The vehicles were prone, however, to come to an unexpected halt on meeting patches of the purple fern which clustered the landscape. A few outcropping rocks were an additional hazard which required careful negotiation. There was no way of steering the flat-bottomed sleds. Wherever obstacles were encountered, it was necessary to halt and manually drag the sled to a new position. Occasionally the gravitational angle produced slopes insufficient to support their motion, and these had to be borne in patient im-

mobility, as did the passing of all slopes other than the one leading in the required direction.

After a survival-ration breakfast they secured to the sleds such items of tools and provisions as they were able to make fast. Then, waiting for the terrain to slope in a suitable direction, they set off. The air was crystal clear and inhabited with a crisp coolness and a heather-honeyed perfume which was decidedly pleasant. Far to their right the burning mountains, now quiescent, stood up glassy and apparently untouched by the conflagration of the night. Nearer and to their left, a vast outcropping of grey-white striated rock formed, with the burning mountains, the shoulders of the valley, some forty kilometres across, through which lay their route.

Their mode of transport proved both exhilarating and predictably hazardous. Swooping down an apparent slope of one-in-three, the ground reared suddenly upwards before them. Fritz managed to drive to a halt, but the momentum of Jacko's sled ploughed it a metre depth into the ash soil before it came to rest. Climbing out from the ditch which he had dug, Jacko's look of murderous reproach threw Fritz into fits of laughter.

However, it was Van Noon who nearly became the first casualty. Driving down a deep slope, where the sled velocity must have been nearing fifty kilometres an hour, the progress of Fritz's sled was suddenly arrested by a patch of fern. Fritz parted company with the sled and proceeded without visible means of support for a considerable distance before he made a spread-eagled landing. He got up, shaken, but miraculously unhurt. Nevertheless much of the equipment he had been carrying on the sled was lost in the ash and could not be recovered.

Despite these and similar incidents and frequent halts while their intended direction lay sullenly uphill or across, they made very good progress. By tacking across their general course they found they could make use of nearly half of the available angles. The mountain shoulders gave

them an easy sense of direction without reckoning and at last they reached the end of the broad valley. Before them now began one of the great steppes of Getawehi, a spotted, rock-strewn desert, completely without vegetation. It continued as far as the eye could see—monotonous and inhospitable.

Jacko viewed the prospect critically.

"We could never cross that on the sleds, Fritz. Too many rocks. There's less than a hundred metre straight run anywhere."

"It's fortunate that we don't have to. By my calculation the construction team ditched somewhere between the steppe and the end of the grey-white mountain. If so, we should be nearly within sighting range by now."

They scanned the area anxiously, but found no sign of the base camp.

"Have you got any distress rockets or anything similar in those bits and pieces of yours, Jacko?"

"No. But I've got some plastic explosive left, and a few detonators. We could at least make a big bang."

"That should do the trick. If we can only get some sort of answering signal to guide us we should be able to locate them fairly easily from here. They should be on the lookout anyway, because they must have seen our ferry fall."

They arranged three explosions, separated by a one minute and then a thirty-second interval. After what seemed like a ten minute wait a slight column of smoke rose up near the grey-white mountain's end at about five kilometres distance.

"That appears to be them," said Van Noon. "Let's go over and meet the troops."

By a fortunate coincidence of angle and direction they covered the distance in record time. Swooping from the heights of a big slope they came suddenly across a string of a dozen men labouring on foot up an ashen trail. The party was encumbered with axes, ropes, and miscellaneous rescue equipment. As Van Noon and Jacko braked to a halt,

the file of men dropped their loads, and, with a loud cheer, came dashing to greet them.

The teamleader was the first to arrive.

"My name's Wooley. We saw your fire-bucket come down behind the mountains somewhere, but nightfall beat us to it. We were just on our way to find you. Frankly we didn't expect any survivors, from the angle she was making when she hit."

"We were lucky," said Van Noon. "We managed to get out before she toppled." He had the distinct impression that Wooley was not too enthusiastic about their arrival.

"Just the two of you aboard?"

"Yes, but I'm afraid we lost the ship. She'll never make space again. But there's a lot of useful stores and equipment in her if you can get them out."

"We'll get them out somehow," said Wooley. "As for losing the ship, that was a foregone conclusion. The spacecraft isn't yet made which can land undamaged on Getawehi. I don't wish to seem critical, but just what did you hope to achieve by joining the suicide club?"

"I'm Van Noon," said Fritz. "By some mischance I seem to have finished up with the responsibility for this little lot."

"Van Noon?" Wooley screwed up his face. "Weren't you mixed up in that affair on Tazoo?"

"For my sins, yes," said Fritz ruefully. "But by all accounts Getawehi has Tazoo beaten by several orders of magnitude. Jacko and I decided that if we didn't want to spend the next five years driving computers neurotic we'd better get down here and get the feel of it ourselves."

"Then welcome to Getawehi!" said Wooley sadly. "But believe me, you're in for a whole lot more surprises yet."

In the meantime, a few of the construction team had borrowed Jacko's sled and had been making short experimental trips across the terrain whenever the opportunity presented itself. Wooley had watched these antics without much enthusiasm, but one particularly successful run

captured his interest. He examined Fritz's sled more closely.

"Did you come all the way on this?"

"About fifty kilometres since sunrise."

Wooley turned and clasped Fritz's hand in a sudden handshake. "Sorry, Fritz! I knew I was being replaced as head of team, but I thought we'd merely get a new boy who'd be making all the same mistakes until he wound up six weeks later in the same situation as I'm in. I hadn't stopped to think of the unorthodox angle. You know, if we'd been at the wreck and wanted cabin liners back at the base camp . . . Dammit, we'd have carried them!"

"Forget it!" said Fritz. "You're not being replaced. It's simply that the overall control for the entire project has transferred itself from its lofty orbital heights to the place where things actually happen."

"You mean they've given you control of the *whole* lot?" Wooley was incredulous.

"Just that. The veritable hot potato."

"No potato that," said Wooley sadly shaking his head. "What they dumped on you was a small star. Come back to base and I'll try to explain it."

"I'd appreciate that," said Fritz. "It's about time somebody gave me a rational explanation of why a group of experienced engineers can't assemble a kit of prefabricated parts."

For a moment Wooley's eyes looked haunted. "I didn't say I'd give you a rational explanation . . . I only said I'd try to explain."

The base camp was a camp in little more than name only. Originally the site of a single space-drop of heavy equipment, it had become the focal point of the endeavours of the construction team solely because there was no incentive to go elsewhere. Behind the site lay the grey-white mountain chain. In front lay the vast mottled steppe. On the ashy no-man's-land between the two, were gathered

various space-drop capsules, some of which had obviously contained parts for the Ixion project. Also there were capsules from later drops, clearly marked as having contained emergency survival supplies.

Living quarters, such as there were, had been constructed from well-entrenched girderwork "borrowed" from the abandoned assembly project, overtopped by parachute material from the space-drop canopies. All the men seemed fit, but it was obvious that the prolonged period of enforced grounding on Getawehi, coupled with strict rationing, was beginning to have its effect. The most disquieting aspect was the look of resignation which rested in their eyes.

Fritz looked out over the broad steppe, something about the configuration of ferns and rocks stirring a thread of memory.

"Isn't this the place where your first ferry sank?"

"Sank!" Wooley was incensed. "It didn't sink . . . it was melted."

"You have to be joking!"

"Do I just! You watch this!"

Wooley turned, seized a crowbar from an abandoned toolkit, and tossed it out on to the rock-strewn desert. One end struck the grey sand, while the other touched a protruding rock. There was a blue spark as it touched. For seconds it seemed as if nothing was going to happen. Then to Fritz and Jacko's astonishment the tool began to glow a visible cherry red. Its temperature continued to increase through white heat to a point where the iron bent and fused into a pool of molten iron. The incandescent metal dribbled into a thread and ran apart. The arc which struck as the curious circuit broke was more in the nature of an explosion, and the watching trio ran for their lives as the area was deluged with droplets of red-hot iron and warm sand.

"Convinced?" asked Wooley, when they had retreated to a safe distance.

"Convinced," agreed Van Noon weakly. "It must have

taken a couple of thousand amperes to melt a bar like that."

"It must have taken many millions of amperes to melt our ship," said Wooley gloomily, "but it did it somehow."

"But this is ridiculous, Fritz!" said Jacko. "How can you have an electrified desert?"

"Not too ridiculous really. Even on Terra you can find a surprising amount of electrical currents in the earth if you go looking for them. On Terra the source is usually electrochemical—minute differences in electrode potential between regions containing different concentrations of mineral substances. But I don't know of any natural source capable of producing some dozens of volts at many millions of amperes—or why the system doesn't discharge itself."

"We've done some investigating," said Wooley. "The grey rocks you can ignore, but we call the black rocks 'terminals'. Actually they aren't simple rocks at all, but columnar graphite structures presumably reaching down to the bedrock. They have an insulating sheath, a sort of lacerated asbestos, which we theorise came to be deposited by electrophoresis of the soil silicates. But however it came about, it's damned effective in insulating the columns from the rest of the plain. The remaining bulk of the desert is merely a mineralated silicate-base earth, not unlike Terran clay. Average potential difference between the terminal columns and the base land is about twenty-seven volts. But it varies pretty widely and can touch a couple of hundred volts in the high season."

"A.c. or d.c.?" asked Jacko, beginning to recover from the shock.

Wooley began to look rather haggard and turned away for a moment.

"You aren't going to believe this," he said. "Generally it's d.c. with the terminals positive with respect to the baseland. But sometimes you get a.c.—especially on Tuesday and Sunday mornings."

"AND if you think that's mad," said Wooley, "wait until you start on the Ixion project."

"You know, Fritz, I'm beginning to get sorry I came." Jacko looked at Van Noon appealingly. "Can't I just go home and sleep it off?"

"Try closing your eyes, Jacko. Maybe it'll go away."

"I tried that," said Wooley. "But it comes back every morning, large as sunrise."

"Well, what *is* the Ixion problem?" Van Noon asked. "The one thing I haven't been able to do is get anyone to talk about it."

"Wait till you've seen it for yourself. I don't think you'll want to talk about it either."

They were approaching a stockpile of carefully classified girderwork, part of the Ixion turntable structure recovered from spacedrop capsules. Wooley consulted a parts list, then drew a few sections from the stockpile and dropped them on the ground.

"A simple demonstration. Girder A measures two metres exactly between hole centres. Don't take my word for it—check it out."

Jacko produced a steel tape from the recesses of one of his pockets and made the necessary measurement.

"Two metres—check!"

"Girders B and C each measure one metre between hole centres, yes?"

"Check!" Jacko looked at Fritz as if seeking release from the infantile nature of what was being demanded.

"Very well!" Wooley was unperturbed. "If you assemble girder B to girder C, end to end with a suitable rivet, the total length between extreme hole centres should be two metres. Right?"

"Right."

"Wrong," said Wooley sadly. He dropped a rivet on to

the ground and waited while Jacko moved the components into line and fitted the fastening loosely into the holes. "If you don't believe me, measure it yourself."

There was no need for measurement. Even viewed from a standing position the combined length of the two half girders was obviously much less than that of the whole one. Refusing to believe the evidence of his eyes, Jacko knelt and carefully measured the combined length of girders B and C.

"One point five seven," he said hopelessly. Again refusing to accept the sum, he kicked the girders apart and checked each carefully before re-assembly. Fritz, who had watched the whole performance with detailed interest, seemed to have withdrawn into a state of deep concentration. At last he took the offered measuring tape from Jacko and repeated the whole ritual for himself. Intrigued by the situation, he found several other objects and measured them individually and together. Then he straightened.

"Incredible," he said, "but very definitely true."

"Then explain it to me," said Jacko. "In all my books twice one is two—and it's never before been in dispute."

"But your books were written on Terra, not Getawehi. On Getawehi they don't apply."

"But that's insane!" Jacko was adamant. "Mathematics is merely a system for expressing the properties and relations of quantities. It's universal, not a local phenomenon. Once one is one, twice one is two . . ."

Van Noon flicked out a slide rule and rapidly reviewed his previous calculations.

"Not on Getawehi. It seems to be different here. Once one is one . . . but twice one is only a bit over one and a half—one point five seven zero eight, to be more exact. And three times one is about two point three six."

"Wooley, you don't agree . . .?" Jacko was still fighting. The look on Wooley's face, however, convinced him that the battle was lost. "I still don't see how it's possible," he finished lamely.

"It's long been suspected that our mathematics may not be universal," said Fritz. "Dimensionless numbers, for instance, although having an accepted value in the part of the universe where we customarily use them, are more likely to be local coincidences than physical absolutes. But on Getawehi we seem to have hit on something even more fundamental."

"Such as?"

"I'm not sure yet, but for my money it's something to do with unity."

"Unity?"

"Yes. Unity ... one ... a whole. I'm no mathematician, but it seems to me there's a darn great hole in our idea of the structure of numbers. We've explored number structure up to infinity and several orders beyond—but something we've always taken for granted is the constant mathematical value of unity."

"But it has to have a constant mathematical value." Jacko's voice was ragged. 'Once one is one ... It can't be otherwise by its very definition."

"So we've always assumed. But what if we happened to be wrong? What if there's a difference between the value of one as representing a whole thing—and the value of one as a mathematical factor. They seem both to be the same in the corner of the universe where our books were written—but one used as a factor on Getawehi is demonstrably only point seven eight five of what it was on Terra."

"You're not right, you know, Fritz. I'll prove it to you."

"How?"

'Take a metre length of iron, cut it in half and then join it together again. By your reasoning we should finish up with a total length only a little above three-quarters of what we started with."

"Let's try it," said Van Noon. "We have to settle this one way or the other before we all go merrily insane."

Wooley provided welding equipment, and they tried it.

The final measurement was a little over point seven eight of a metre.

"But I still don't see how you can reconcile it with the law of conservation of matter," said Jacko.

"Where do you keep the alcohol?" asked Fritz Van Noon.

"So what are we going to do with Project Ixion?" asked Jacko the next day.

"I've been thinking," said Fritz. "It's not going to be easy even if it proves possible. The Ixion assembly is a pretty complex girderwork construction. Every part has to be accurate if its's going to fit. My first thoughts are to take every girder, cut it in half, and re-join. In that way we might be able to construct what is, in effect, a scaled-down version of the original design."

"Is that acceptable?" asked Jacko. "Surely some of the parts have a critical size."

"I don't know. I tried to put this question to the *Tycho Brahe*, but I don't think my message was received. Apparently the pinnace can hold our position by line of sight, but it's not easy for us to track the pinnace because of its unstable orbit. Anyway, I suspect this is a problem for the design team on Terra rather than something which can be settled on the *Tycho*."

"Then you want me to try cutting and joining the girders?"

"We'd better have a go. We certainly can't make matters any worse than they are. I've a suspicion, however, that the problem isn't going to be solved that simply."

"You're the boss!" said Jacko. "I still can't convince myself that it happens at all, but at least we'll go through the motions."

Six hours later Jacko found Van Noon crouching at the laser terminal trying to maintain sighting on the pinnace. Such was the relative crudity of the ground terminal that

sighting on a small and erratic spaceborne target such as the pinnace was so precarious as to be nearly impossible.

Jacko shook his head wearily. "Project Ixion's no go, Fritz. We've tried cutting and joining the girders, but it doesn't help. Where the assembly calls for a total span to be formed of thirty components along one edge and only five in another, the whole scheme falls down. Short of cutting every girder into the total number of parts required to form the entire project—and then re-joining them—we don't stand a chance of getting anything to fit."

Van Noon stood up. "I was rather afraid of that. We'd need a computer down here to calculate the operations needed to resurrect the original design, and even then we've no guarantee that the final de-scaled assembly would do the job it was designed to do."

"Is it worth continuing with the work?"

"No. Abandon the whole thing. There *has* to be a more rational way out of this. As far as I can see, Ixion in its present form is destined to be a dead duck. I wonder where the heck they found a name like that for it anyway?"

"Mythology—rather symbolic as it turns out," said Jacko mournfully. "Ixion was a character who killed his father-in-law and then tried to make love to Jupiter's wife. As punishment, Jupiter ordered him to be tied to a fiery wheel and rolled for ever throughout Hades. Right now I know exactly how Ixion felt."

Van Noon was suddenly alert. "Say that again, Jacko."

"Right now I know exactly how Ixion felt . . ."

"Not that! About the wheel?"

"Tied to a fiery wheel and rolled for ever throughout Hades . . ."

"That could be it!"

"What's on your mind, Fritz?"

"I've just realised how it's done. Why didn't I think of it before?"

"You're way ahead of me. How what is done?"

"The gravity, of course. And the burning mountains, the

radio output, and the self-consuming spaceship—they're all part of the same scheme."

"Can we just go back to the start?"

Van Noon was jubilant. "That *has* to be the answer! Wheels within wheels ... the fiery wheel of Ixion ... rolling forever throughout Hades ... suddenly the pieces all fit together. All we have to do is prove it."

"I'll get them to spacedrop a good psychiatrist."

"Not for me, Jacko. I never use 'em. But if I can get my hands on a good computer and a hyper-radio link with Terra, I think I've just made the Ixion project obsolete."

Six

"Radio Officer presents his compliments, sir. Requests yourself and Commander Brumas to come to the radio room immediately."

Nash returned the salute and shot a quizzical look at Brumas, who was sitting near him at the conference table. Then he looked back to the courier.

"Is it important?"

"Radio messages loud and clear from Lieutenant Van Noon on Getawehi, sir."

"Radio messages? I thought radio was impossible under these conditions? Dammit!" He looked round at the expectant faces of the officers present at the conference. "In the circumstances, gentlemen, I'm afraid I must call this meeting to a close. It would seem Van Noon has already achieved something of the impossible. There'll be a progress report at twenty-hundred hours ship's standard time. Until then, all sections are to stand in readiness. This may be the break we're looking for."

With Brumas at his heels, Nash reached the radio room in record time. The Radio Officer was supervising a narrow-band lock on the big receiver, which appeared to be tuned to a slowly drifting signal.

"Van Noon to *Tycho Brahe*. Are you receiving me? I say again . . ."

"Can we answer?" asked Nash.

"Not by radio. We haven't anything available with the sort of power that Van Noon's using. All our transmissions would get lost in the mush. We're just linking a relay so that we can answer via the laser circuit on the pinnace. It's easier for us to get messages in that way than it is for Van Noon to get messages out."

"Fine!" Nash waited impatiently for the hookup to be completed. "Hullo, Fritz! We are receiving you perfectly. How the Devil did you come by a high-power transmitter like that?"

Van Noon's voice came over the noise with rare fidelity. "If I told you, Colonel, you wouldn't believe me. Anyway, thank heavens I've managed to raise you. I've been calling for nearly two hours."

"We weren't watching for you on the radio bands because we didn't think it possible for you to use them."

"Anything's possible once you know how."

"I'm glad to hear you say it. How're you making out with the Ixion project?"

"I agree with Wooley that we might as well sell the existing parts for scrap. No one could ever assemble them on Getawehi."

"That wasn't the answer I wanted to hear." Nash was disappointed. "Is there no hope at all?"

"Not for the Ixion structure. But the Ixion *principle* might be a different matter. Unless I miss my guess, we can duplicate the function of the Ixion project without actually building it. But I'm going to need help."

"You name it, and you've got it, Fritz. By the way, Commander Brumas is anxious to speak to you, so I'm handing over for a moment."

"Hullo, Commander! You'll be pleased to know the whole team down here is fit and well."

"I suppose that's some consolation." Brumas was grave.

"Did you get around to having any ideas as to how we can get them off Getawehi?"

"Get them off?" Van Noon sounded surprised, then the humour came through in his voice. "I don't think that'll be much of a problem. When the *Tycho Brahe* makes planetfall they can wander aboard just like anybody else."

There was silence for a long moment, broken only by the hiss of white noise on the radio link and the muted hum of the radio room equipment.

Finally Brumas spoke. "I don't think I quite understood you there, Fritz. For a moment I thought you were suggesting that the *Tycho Brahe* make planetfall on Getawehi. I..."

"That's exactly what I did say, Commander. I need the *Tycho Brahe* down here. I need the hyper-radio link, I need the ships computers, and I need a mass of manpower."

"But you can't jeopardise the *Tycho Brahe*. For pity's sake, Fritz! You know what happens to a ship attempting to make planetfall on Getawehi."

"I know what used to happen, but we've got ourselves a few answers since then."

"You can't be serious, Fritz?" Colonel Nash was back on the circuit. "There's no point in writing off the Labship as well."

"I don't intend to write it off. All I need is a direct two-way speech link with the senior pilot during the talkdown. Given that, I'll guarantee a safe touchdown and that the ship will remain intact after landing."

"I can't permit it," said Brumas. "The risk is far too great."

"Are your recorders on, Commander?" asked Van Noon.

"Certainly. Standard procedure—why do you ask?"

"Because I want this firmly placed on record. I was appointed Senior Adviser for the whole exploit. My considered senior advice is that you should bring the *Tycho Brahe* to planetfall on Getawehi. If you should ignore this advice, I demand that this recording be placed in evidence

at any court martial which may subsequently transpire. If you don't do as I ask you have no chance at all of recovering the team on Getawehi."

"Damn you, Fritz!" said Brumas. "Let me speak to Wooley. I want evidence as to the unsoundness of your state of mind."

"You already have evidence. Look through your telescopes. Wooley's out in the valley with his crew, laying out landing markers to guide your descent."

"Very well, Fritz . . . you win!" Nash's voice carried begrudged acquiescence. "It'll take about an hour to put the ship in a state of readiness. After that you can begin talkdown. But I hope you know how much responsibility you're taking on yourself. There's two hundred men aboard the *Tycho Brahe*."

"I know it, Colonel. But I wouldn't put a mouse down on Getawehi unless I was absolutely sure."

"I still don't see how the hell you can be so certain. Every other ship that has touched the planet has come to a sticky end."

"It's just that I'm beginning to gain an understanding of Getawehi. It seems that she and I both have the same sort of outwards-facing-interior approach."

High above them in the uncertain heavens a tiny firepoint denoted the position of the descending *Tycho Brahe*. Its visual distance belied the fantastic thunder of its jets. Even from the extreme altitude the sound carpeted the land with a pattern of thunderous echoes which were reflected and amplified by the valley's throat. With sweat on his brow, and a shielded microphone pressed at his throat, Van Noon was making the critical talkdown. At his side, Jacko, operating both rangefinder and telescope, recited a constant stream of information which served as an informative background to Fritz's constant monologue.

The Labship, its falling now controlled only by braking jets and stabilisation gyroscope, was weaving an erratic

course through the lower atmosphere. Its point of destination was a mere approximation due to its curious deviations from the geocentric vertical. Everything now depended on the smooth continuance of the radio link with the *Tycho Brahe*'s pilot, and upon the pilot's ready acceptance of Fritz's instructions. In such a manoeuvre the pilot's word was law. It was his decision to accept or reject advice affecting the safety of his ship, and his replies were routed via a laser link from the ship to the ground.

"Make ready for touchdown. Cut outer jets. Full boost on central thruster . . ." Van Noon's voice continued precisely above the wave of sound as the mammoth ship loomed in the air above them. "Gently cut back . . . try for a ve-ry soft landing . . . don't worry about the angle you're making . . . Doing nicely now . . . only metres to go . . . and as soon as you feel the ground, cut jets and cut leg servos."

"Are you mad? With the terrain sloping at this angle?" The pilot's voice came back with swift dissension.

Van Noon was firm. "Do as I say, or you've no chance whatever."

"Check! I can feel the ground. Cutting jets and leg servos. What about the gyro?"

"Leave it running."

"Are you sure?"

"I'm sure about nothing on Getawehi. But leave it running. Oh, and one thing more . . . for Pete's sake don't let your engineers dismantle anything. If they do, they'll never get it re-assembled."

The frantic bellowing of the jets subsided and the blinding hailstorm of dislodged ash soil settled in a broad area to reveal the *Tycho Brahe* safely planetbound but leaning at a decided angle to the vertical. Open mouthed, everyone waited for her to topple. Those of Wooley's team who were able to manoeuvre sleds "downhill" came shooting across the valley, convinced they were on their way to a major catastrophe. Van Noon only smiled slightly to himself and mopped his brow, directing Jacko to watch the stability of

the Labship's landing pads which were buried deeply in the loose Getawehian soil.

As the uncertain gravity altered its angle and continued its slow rotary progression it became apparent that the towering mass of the ship was not going to topple. Jacko reported that the landing assemblies were firmly planted and showed no sign of wanting to tear out and wander, as had those of the first ferry on Getawehi. With an air of uncertainty the nose-tip of the great craft moved in a broad arc as the angle at which the ship was leaning followed the migrating highest point of the horizon. Even so, it was nearly half an hour before the shipboard establishment cancelled the state of blast-off emergency and could be encouraged to open the hatches and leave the ship.

Characteristically, once the decision had been made, Colonel Nash was first out. He moved thirty paces from the ship, turned and looked dubiously at the huge bulk leaning above him, then set off downhill at a steady run until he was sure he had put more than a ship's length between himself and the metal Nemesis. During the course of the run, what had been downhill became across-the-hill and finally began to curve upwards. He stopped then, shaking his head sadly, and walked the rest of the way to Fritz's control point.

Van Noon wearily laid down the microphone and saluted. "Welcome to Getawehi, Colonel!"

"It's an experience I could well have done without," said Nash. "I must congratulate you on safely conducting our touchdown, but it does raise a few interesting questions."

"Like what, sir?"

"Like how the hell did you do it? Every other craft has either toppled or walked its way to destruction."

"Simple," said Fritz. "I played Getawehi at its own game. If Getawehi wants it that 'up' is angled umpteen degrees from the geocentric vertical, then so be it. Let the ship come down out of vertical, and let it stay that way when it's

landed. The thing you mustn't do is try to fight it. It's axiomatic that Getawehi is going to have a last word."

"But won't the *Tycho Brahe* walk?"

"No, and for the same reason. The leg servos, which are responsive to the geocentric vertical, have been cut out. We're not trying to use a stiff leg where a bent one is needed."

"I'll take your word for it," said Nash heavily. His eyes were still nervously watching the trials of the leaning spaceship. Then he shrugged resignedly. "Very well, Fritz! You've got the *Tycho Brahe* down here, hyper-radio transmitters, computers, and all. You've demonstrated that the Ixion structure cannot be built—so now let's hear your plans for an alternative."

"First," said Fritz, "I have to prove a theory. For that I need the computers and a lot of manpower. If I can prove what I suspect is true, I shall then need contact with Terra to verify that Getawehi itself can supply the information that Ixion was intended to collect."

"The entire ship's facilities and the manpower's yours. All I ask is that we can make a getaway from Getawehi in a reasonably short period of time. Which reminds me, you haven't yet explained how you managed to acquire such a powerful radio transmitter."

"I left the details of that to Jacko Hine. But I don't think he much likes talking about it either."

SEVEN

IT took three weeks, with teams ranging over a several hundred mile radius, for Fritz to collect and collate the necessary information. For most of this time the shipboard computers on the *Tycho Brahe* worked continuously, sifting the data from the on-line transducers and from recorders which the sled teams kept bringing in. Piece by piece the pattern which Van Noon had intuitively deduced

was verified and described in the mathematical detail which only a high-power computing complex has the ability to construct. From this Van Noon re-drew his simplified models more suited for communication between men. When he was satisfied, he established a hyper-radio link with Terra. For three days more the ship's computers chattered to and were interrogated by their counterparts in the Terran Computing Centre, while Van Noon himself argued on a more prosaic level with the Ixion Project design team.

On the last day he gained the point he had been seeking, and called an immediate conference of all senior personnel concerned. When they were seated, he rose and passed the message transcript round the table.

> VAN NOON ... TYCHO BRAHE ... AGREE ALL POINTS ... INFORMATION SUPPLIED PROVES IXION ENTROPY CONCEPT VALID AND VIABLE ... PROJECT NOW DRAWN SUCCESSFUL CONCLUSION ... THIS MOMENT HISTORIC ... CONGRATULATIONS ALL CONCERNED ... IXION CONTROL.

After a few minutes Colonel Nash rose uncertainly to his feet.

"Gentlemen ... I'm sure we're all glad to know that the Ixion concept is viable. And I'm sure we're all delighted to share in the congratulations for the successful conclusion of the project—especially after it was so nearly a disaster. But I have one important question to ask. Fritz ... what the hell is going on?"

Van Noon stood up, grinning broadly. "I must apologise, gentlemen, if the last phases of the operation seemed something of a mystery. The trouble was that I leaped to a conclusion about Getawehi which was so unorthodox that I doubt if you'd have given me a second hearing had I attempted to explain. Fortunately, events have proven me right. In case any of you haven't already reasoned the position for yourselves, I shall now be happy to explain. Of

course, the whole key lies in the peculiar nature of Getawehi's gravity."

"You have an idea of what causes the variations?" Brumas was sharply attentive.

"Yes. I theorised that the effect was consistent with the presence of orbiting satellites of very considerable mass. In point of fact, what we were experiencing was the result of several interacting gravitational attractions rather than the single one to which we are accustomed on Terra."

"Ingenious!" said Brumas. "But not very convincing. To take the main point—Getawehi *has* no satellites."

"I'm afraid you're wrong," said Van Noon. "We have orbital plottings of three major satellites and the reasonable suspicion that at least another twenty minor ones exist."

"Rubbish! I tell you there are no such things." Brumas was becoming annoyed. "Dammit, we've been observing the planet from space for over six months now."

"From space you wouldn't see them. You see, Commander, they happen to be internal satellites—orbiting beneath the planetary surface."

"Nonsense!" Brumas flared with anger. "If this is some sort of a joke . . . !"

Colonel Nash rose and calmed the sudden uproar. "Gentlemen, I think you now see why Lieutenant Van Noon didn't attempt to discuss the matter before. Very few of you have been exposed, as I have, to Van Noon's contempt for orthodoxy. At first sight it always hits below the belt. But somehow the damned idiot always makes it so plausible that I can assure you it's futile to get into an argument with him." He turned back to Van Noon. "I assume, Fritz, that you do have some justification for this amazing statement?"

"Certainly!" Fritz was unruffled. "By the use of weight-loaded strain gauges distributed over a wide area, we have been able to plot the mass, size, and orbits of the three major satellites. The orbital information is precise and all

orbits fall well within the mantle of Getawehi. The mass and size figures are enough to make your hair curl."

"Why so?"

"Because the only material known in the universe which could possibly have that mass and density is material which has itself suffered gravitic collapse—degenerate star-stuff—matter so far collapsed on itself that its atoms are virtually in contact with each other."

"As would be material from completely exhausted dwarf-stars?"

"If it were possible, yes. Factually, these small satellite bodies constitute over two-thirds of Getawehi's actual mass. Their orbital speed is low, and the planet is virtually an envelope which lollops around the variable centre of gravity of the satellite group. Getawehi's surface gravity is a compromise between its own weak attraction and the higher, yet mobile, attraction of the hyper-dense orbiting nuclei."

"Are we to understand, then, that Getawehi is hollow?" Nash was puzzled.

"Far from it. It's internal structure is probably not too dissimilar from that of Terra, except that the crust and solid mantle of Getawehi must be many times thinner. Also the whole inner core must be in a molten state—probably molten nickel-iron. It's within this core of liquid metal that the satellites orbit."

"If you say so." Nash settled back and chewed his moustache. "Very well, Fritz! I'll accept that, because I've no doubt that you have it well documented. Now tell us what you used as a substitute for the Ixion assembly?"

"In a moment," said Fritz. "First let me deal with the electrified desert, since it's all part of the same story. There just had to be some natural mechanism available capable of producing substantial voltages at an almost limitless current. I approached the problem by considering what type of windingless generator could produce this order of electrical output. The answer was a homopolar generator."

"A what?"

"A homopolar generator—the simplest electrical generator ever devised. It consists essentially of a large conducting disc or rotor, spinning in a magnetic field. Once I had hit on the idea of satellites orbiting in a molten metal core, the answer was obvious. Getawehi has a strong magnetic field, and nine-tenths of her volume is a rotating ball of conductive, liquid metal. Getawehi *is* a homopolar generator, and one of no mean proportions. The black rod-like terminals apparently project through the solid mantle and act as current pickoffs. I suspect that variations in output are somehow associated with satellite turbulence and to the fact that frequently the whole system gets its axis out of line with the planetary magnetic field."

"But you still haven't built another Ixion," argued Nash.

"I didn't need to. As I thought, the Ixion structure was a massive but fairly simple device, intended to detect some of the oddities of entropy distribution in the continuum by measurement of fairly simple parameters. It was obvious that it was going to work because all the dimensionless numbers relating to entropy calculations are different on Getawehi—and even the dimensional numbers have adapted to follow suit."

"But the hardware . . .?"

"It wasn't needed. The criterion of Ixion was not its complexity, but its size. When I offered Terra not a large turntable but a planet-sized ball of rotating metal complete with current pickoffs, they were overjoyed. They had to recast their parameters, but we were able to feed them in a few days the type of data that the Ixion structure might have taken centuries to produce."

"Hmm!" Nash was thoughtful. "As usual, Fritz, you seem to have all the answers. But I can see some of the technical boys have their toes curling up. I suggest we adjourn for a while to allow them to catch up on the figurework. As for you, Fritz, you're coming with me."

"Where to, Colonel?"

"To show me what the hell Getawehi uses as a high-power radio transmitter. I swear I've examined every square inch of this planet by telescope without detecting even so much as a banana plug."

Van Noon shrugged. "I suppose you won't be satisfied until you've seen it for yourself . . . and you may not believe it even then."

As the sleds neared the range it was possible to see the light from the burning mountains even in broad daylight. Despite a favourable angle of slope, Colonel Nash halted his sled at a distance and took out his field glasses to study the phenomenon. Van Noon drew up alongside.

"How does it work?" asked Nash at last.

Fritz waved his hand. "As with the steppe, the whole ground-mass is electrified. The mountain itself is a great mineral outcrop which consists largely of conductive silicates and laminated strata of various metalloids including gallium and its compound arsenide."

"So?"

"So the whole mountain is electrically alive, with random electrical potentials everywhere. In the high voltage periods the great mountain currents surge through the partially conducting, partially semi-conducting layers, inducing all manner of curious effects. One of these effects is to cause some of the gallium arsenide layers to convert the current flow directly into light."

"Of course—electroluminescence!"

"It doesn't stop there," said Fritz. "None of the metalloid layers are particularly pure, and all of them contain numerous slip-faults. In these circumstances it is inevitable that you find a profusion of naturally formed *p* and *n* junctions which would drive a solid-state physicist psychotic. As the potentials vary you get great transistor switching actions with thousands of amperes being diverted up and down the mountainside like the great grand-daddy of all thyristors

gone crazy. That's why you get the glow running and shimmering through the mountain like that."

"Fantastic! If I hadn't seen it myself I'd never have believed it."

"You haven't seen anything yet," said Van Noon.

By the time they reached the foot of the mountain itself the glow had died as abruptly as on the occasion when Fritz and Jacko had first seen it. Now the fissured and laminated glassy blocks of the mountain lay apparently lifeless and inert, and only the instrumented probes which Fritz applied to the surface showed the drift and drain of the electrical currents still surging in the mountain.

"Look to the end there," said Van Noon. "Where the mountain reaches down to the steppe there's a silvery outcropping containing a series of thrust faults. That's a typical formation distributed widely over the surface of Getawehi. Like the burning mountain, the lamelar layers show marked transistor action. The outcrop is predominantly laminated silicon semiconductor layers. Subjected to the terrain currents, almost every similar outcrop is a radio transmitter at some state of the current flow."

Nash stopped and wiped his brow. "I won't buy that one, Fritz. I grant you that you have the current and you appear to have the semi-conductor material. But even I know that you don't get a radio transmitter by throwing random transistors into a box."

"No," said Fritz, "but there is a logical explanation. In these fractured semiconductor masses you have potentially every aspect of transmitter function: capacitance, conductance, inductance, switching, amplification, and even piezo-electric oscillation. And you have time."

"I don't see what time has to do with it?"

"Evolution takes time, Colonel. Pass too much current through a transistor junction and you destroy it. Start with an infinity of potential transistor circuit paths and destroy and modify them slowly, and one day you'll strike a circuit which will function—it will dissipate current rather than

be destroyed by it. Continue the process for long enough and the only circuits which survive will be those capable of dissipating energy. Thus active circuits will become the rule rather than the exception—by a process analogous to natural selection on a biological level. The burning mountain survives by dissipating the electrical energy in the form of light. The small outcrops predominantly dissipate in the radio frequencies."

"I still find it hard to believe," said Nash.

"When you consider the capabilities of natural selection processes, a radio transmitter is a far less unlikely product than is a human being," said Fritz quietly.

Nash looked at his hands reflectively, then nodded. "And you used one of these outcrops as a transmitter to contact the *Tycho Brahe?*"

"We had to—er—modify it to suit our needs. But yes—that's basically what we did do."

"I see," said Nash. "Your ingenuity does you credit, Fritz . . . but then I suppose that's what we employ unorthodox engineers for."

"In this case," said Fritz, "I can't help feeling that Jacko surpassed himself. He can claim to be the first man—and I suspect also the last—ever to add an audio modulator to a solid state transmitter . . . with a pickaxe!"

ALL DONE BY MIRRORS

by

DOUGLAS R. MASON

The idea was to create 3-D mirror images of a human being each with its own identity. One might say that, upon reflection, it was an experiment in depth.

ALL DONE BY MIRRORS

SEEING the man once, in plain unity, had been enough for Thorbury. There was something about him that he instinctively disliked. Though he had to concede to himself, that he was a minority of one in that respect.

George Exton was everybody's idea of the distinguished scientist. Tall, well-built, greying hair slicked back and curling with juvenile charm in the nape of the neck. In fact, he could be an ageing juvenile lead. Give him a dark wig and a white horse and his handsome, aquiline face would be a natural for the bit where the man leans down and scoops the girl off the sand.

Or drags her, stumbling, by a tether.

Maybe that was what fascinated his chief assistant Christine Veck. Perhaps she liked to be dominated? Sent a delicious shiver, rattling unseen beneath that smooth carapace?

Well, she got plenty. From what he had seen so far, she was the chopping block of the unit. She stood between Exton and the rest of the research team, took his arbitrary instructions and passed them on in a more acceptable form. For which she got no thanks, that he could see, from either side.

Exton was moving now and the multiplications of his image were like a hurrying mob of diplomats breaking from a conference.

Thorbury edged along behind the long console that ran like a shelf under the observation window. He stopped at the centre station behind the Veck chair.

Down below, the huge studio was taking enough power to light a small town; but the projection was selective and

the background props were invisible. The 3-D images of Exton appeared to exist without material support.

It was a converted hangar. God knew what it had cost to equip. There must be fifty thousand mirrors and prisms in the layout. Then there was the irradiation plant which was the special Exton contribution.

Christine Veck was calling the shots in a cool, unhurried voice. "Five seconds, starting now. Bring it down slowly, Pete."

The crowd in the hangar began to thin out. The tide of Extons receded. When there was only one, a little off centre and standing still, it could be seen that he was surrounded by a circular, transparent booth. Then the rest of the set came out of shadow.

As in a theatre, when the lights go up and the illusion slackens, there was a sense of anti-climax. So much stage machinery; the rug whipped from under the fantasy.

Now the structure was plain. A great circling mobius of receding mirrors and prisms with the structural work in slotted angle like a lunatic child's construction toy. A Coney Island Ghost Train with the lid off.

Roger Thorbury transferred to the more rewarding view of the head in front of him. Hair the colour of pale ash, caught severely in a narrow electrum ring and falling neatly to the mandarin collar of a warm, apricot coverall. The face, reflected conveniently for him in the observation window, was a full and satisfying oval, given character by a straight nose and a full-lipped mouth. His own long, sardonic mug hung dimly above it and drew her attention.

Her eyes lifted from the console, briefly registered what he was at and tracked on through the glass to pick up the centre pin of the action.

The snub direct and by a reflection at that. Thorbury had a malicious satisfaction when Exton's pompous voice came from the tannoy overhead. "What are you playing at, Christine? That was a perfect run. Why have you stopped at phase one?"

"That was what we agreed, Professor. A final proving run and the second stage brought in this afternoon, if you were satisfied."

"I expect you to use a little initiative. When things are going well, you should go ahead. Get me out of this damned box, I want to see the record."

"Very well."

No doubt, it was one of the perks that went with fame. The rest of the crew on the console seemed to take it without comment. Thorbory left them to it and went out of the building to the small office that was put at the disposal of visiting riff-raff like himself.

Not much to say yet; but he could rough out an opening paragraph for his journal. He spent ten minutes at it, dictating and erasing and saw Exton march out with Christine Veck in attendance. They climbed into a long, white, open Mercedes and Exton was moving off before she had closed her door.

It was an opportunity to look round, without the maestro breathing down his collar. He crossed the tarmac again and tried a small door in the double-leaf entrance to the hangar. No dice. He went round to the main entrance, which he had used before and the ex-policeman at reception asked him for his pass.

"You've seen me. I was in just now. Press. I'm writing a piece about the project."

"The professor's just left. Who do you want to see?"

"I just want to look around."

"That's not possible."

"What are you running here. There's nothing classified about this. Everybody knows what's going on. I'm here on invitation."

"That's as maybe. I have my orders. You could go along to the canteen. Speak to somebody there. Dr. Veck went out, but you'll find Dr. Naylor there. He's next in charge. You'll be wanting a bite of lunch, anyway. It's not too bad."

"Which way?"

"Out again. Turn left. Follow the building round. You can't miss it."

Thorbury thought that, for a guest, he was being given the run around. Mind you, "guest" was stretching it a bit. He was in because the foundation that published his journal was one of the subscribers to Exton's fund. Permission had been reluctant and conceded on the understanding that nothing was printed without the Exton seal of approval.

On the whole, he was getting tired of the assignment. Close up, this Exton looked too much like a petty dictator.

Naylor was aplogetic. A small, nervy man with a round head and dark, receding hair.

"Ah, Thorbury. I'm glad to see you found your way here. Sorry I missed you, after the show. I thought you'd decided to go off to the local. I'll get you a drink. What will it be?"

There was a single table running down the centre, a servery set in the end wall and a well-stocked bar at right angles to it. Six or seven of the researchers were already eating. A group of three was standing by the bar counter. There was a more relaxed atmosphere than he had noticed yet.

Settled with Naylor before a pint of excellent bitter and a healthy salad, he felt more charitable and asked the courteous, expected question about a peculiarity in the mess.

"What's the angle about that tin of Harpic hanging over the bar?"

"That's Joe Bodill's station. He's a founder member of the team. Been working on it so long, he's clean round the twist."

It figured. It was a setup, with minor differences, which he had seen on a dozen assignments. All jolly boys together. Brilliant qualifications, but simple at heart. Anxious to show that they had not lost the common touch.

But was that good enough? Researchers should be sophisticated all through. Then maybe there would be less sur-

prise when the fruits of an expensive investigation turned sour.

Still it seemed unlikely that anything dangerous could come out of this one. They would not have to make the naïve plea, "We were just doing it for Science, other people used it for War."

Unless, of course, a multiplication of Extons could be classed as a secret weapon.

However, there was no call to knock Naylor, who seemed genuine enough and relatively expansive out of the weighty shadow of the top brass.

Thorbury said, "I think I've got the picture. The layout in the lab is just a special reflection job. The subject is duplicated and reduplicated, until the images are built up in the round. There's a 3-D re-creation of the subject. Any number you like."

"That's so, and don't forget the directional aspect. Here, we have it concentrated, but you could duct it through a building and have the image appear in another room. In several rooms, simultaneously, for that matter. That's where there's an immediate application. Teaching by closed-circuit TV is useful; but think how much greater the impact will be when the teacher is present for all intents and purposes in each lecture room."

"That's another step, surely. The 3-D image is no better than the flat picture, except that it's more vivid. It still can't deal with immediate queries from the floor."

"Right enough. If we were only doing that, there wouldn't be any justification for this unit." Naylor looked round nervously, as though he expected Exton to materialise at his elbow. "Phase two is the big news. Obviously, I can't give you the details; but when we bring in the irradiation of the subject, there is reflection in depth. Not just a surface image. Every living tissue is represented."

"You've done this?"

"By itself, yes. For short periods. No harm to the subject

either. We've done it with all the usual animals. Not a trace of damage."

"Now you combine the two ideas. It'll scare the pants off a bunch of students to get a lecturer with his guts all luminous."

Naylor looked disappointed. "It's no joke, Mr. Thorbury, as you'll see. And it isn't that way at all. Although the depth irradiation makes the whole of the interior content available for reflection, the image appears solid. I'm not sure how much of the detail Professor Exton will release. You will have to talk to him, before you go."

There was more tension in the narrow operations room at the beginning of the afternoon session.

The white car had swept back and Exton had disappeared into his private office with the patient squaw a pace to the rear carrying a briefcase. Now the man was fidgeting round his transparent shell and checking circuits with the power console.

Thorbury said, "Dr. Veck, I'd appreciate it if I could have a talk with the Professor at the end of the exercise. Or if you could fill in some of the gaps. I want to do justice to all this brouhaha. I wouldn't like to miss a vital link."

He got a wide, blue stare like a peasant asking for cake at the czarina's *troika*.

"Later, Mr. Thorbury. I will see what can be done. This is a very delicate operation, which requires exact timing. I must ask you to keep silent as soon as the red alert shows. Any break in concentration could have serious consequences."

Tell-tales over every station blinked on cue from amber to red and Thorbury filed his reply for future use. He was getting very tired of the idiotic-child role.

Exton had come to rest in the centre of his capsule and the house lights dimmed and went out.

For a count of five, there was only a single shaft of light dropping in a solid column on Exton, then other capsules glowed into life.

Concentrating, as he had been invited to do, he saw that each one had been given a pedestal, like a flat-topped lectern. Every one had a piece of equipment. He had identified a calculator, a cash register, and a typewriter when Exton's began to multiply.

Christine Veck was efficient, whatever else. A good, unhurried executive to have at your back. The team of six operators fell into a smooth rhythm of response as she worked systematically through phase one.

There were more Extons than you could shake a stick at; standing each in the centre of a column of light, apparently suspended in space, filling the set at every level.

It was an illustration that pattern could be made from anything. A pleasing form could be built irrespective of content. Even bags of old gut rightly sited.

Christine Veck called for phase two and the tension in the control room was a palpable thing.

In spite of himself, Thorbury identified with the group. He wanted them to bring it off. After all, it was a subtle bit of human endeavour and expertise in any cause had a claim on respect.

He picked out the original Exton, who was glowing a little more brightly than his duplicates. The man had taken up a handset and was talking into a recorder.

Almost at once his voice came in on the tannoy. "Body temperature 38. A rise there. Pulse normal. Blood pressure up a point. No discomfort. I can maintain this for as long a necessary. Now I shall work through the task for this station."

He pulled up a stool and sat down, opened a folder and drew out a couple of sheets of paper.

The action of sitting down, simple enough in itself, became a flash point for the watchers in the control room.

Less than a third of the images had followed suit. Even those which had done so, showed variants of pose as they settled to the task allotted to their station.

It was a fantastic sight. Thorbury could imagine an in-

finite regression of Extons, all busy on some meretricious ploy. A world full of ninnyhammers.

There were possibilities. One good man could run all the departments of an enterprise. One competent politician, if one could be found, might set up his own cabinet. Unified control had become practicable in a single step.

But then who wanted it? It was sterile. Narcissistic. Progress came from dielectics. Nobody could struggle with himself.

In spite of the spectacular success, there was no difference in the Veck delivery as she began to set it up for the end game. Cool, precise tones. On a general net, she spoke to every booth.

"Time is up for this run. Please be seated. Professor, orientate by the centre line of the pedestal. Thank you. That's fine. All ready except . . ."—she was a second checking the reference—"Number 256. Number 256, please"—the voice took on a harder edge with an undertow of anxiety. "Number 256, please be seated, orientate by the centre line of the pedestal."

Appealed to for the second time, the rogue Exton turned slowly in his capsule and stared out of his shell of light towards the observation window.

It was a genuine Exton, all right; but small differences were cumulative. Now, Thorbury could see why he had instinctively disliked the man. On this model, all the minor facial disharmonies were intensified. Eyes were seen to be set too close. The mouth had developed from arrogance to plain cruelty. This image had picked up a disproportionate ration of ID and was currently doing a demolition job on the small computer it had been given to operate.

Christine Veck appeared to be out of programme. She was staring at 256 as at Revelation. Naylor called urgently, "Count down. Christine. Kill the field."

She snapped out of her trance and picked up the sequence. Thorbury found himself watching a number in-

dicator reel back the count as images collapsed from the periphery.

It was all very smooth. The jagged bit had passed as though it had never happened. The counter showed 64 ... 63 ... 62 ... in a steady progress. Number 256 had long darkened out of vision.

Exton himself was sitting hunched forward with his elbows on the desk top and his head on his hands.

At 1, the counter stopped and Thorbury waited for it to clear to zero. He was not alone. Every eye was watching the indicator. Christine Veck said sharply, "What's holding you, Pete. One to go."

Peter Alman, youngest member of the team, a genial extrovert with an aggressive crew cut, said, "That's it. You've had it. All clear."

She hesitated a second and went into the final stage. The capsule round Exton hinged apart. He was free to move out. Service lights in the hangar showed the gaunt ribs of the structure with nothing moving. Then a couple of technicians in white coveralls appeared at floor level and began to climb the gantry to reach the motionless, centre figure.

They saw the first one swing himself on to the platform and heard him say. "All finished, Professor. Very successful run, sir. Can we begin to disconnect this gear? Are you okay, Professor?" He had a hand on Exton's shoulder and the arms appeared to collapse like so much rubber. Exton fell forward across the desk and then rolled sideways off the chair. He seemed to be folding in on himself like a collapsing balloon. The second man reaching the deck had nothing to see. He put it in words, "Where's the Professor, then? I thought he was still up here?"

Outside the hangar there was noise of a car starting up. Thorbury was first out on the tarmac, with a wild surmise that turned to certainty at the sight of its driver. Exton took off in a crash start that stripped a millimetre of rubber from his rear tyres and was dwindling in middle distance when Christine Veck appeared on the pad.

Thorbury said, "He didn't tell me where he was going. It looks as though I don't get that interview. Perhaps you could answer a few small questions."

Surprisingly, she looked more human by natural light. Also, she went direct to a non-academic question of her own, which accepted that the figure in the car could only be Exton, "You don't like him, do you?"

"I don't know him too well. He doesn't set out to encourage strangers."

"I've worked with him for five years. He never spares himself. He's taught me a lot."

It was an opening for wit, but Thorbury let it pass. She was very serious. Obviously troubled. He kept to the scientific level. "What do you make of it, then?"

"Perseverence of an image. The field maintained itself. He had already left."

"Is that what you really think?"

"What else?"

"The other images looked very real."

"Of course. They had real existence for the time of the transmission. At any one time there are any number of possible choices in the mind. The immediate environment brings out what is necessary to cope with what is presented. Multiply the person exactly and present different tasks and it meets each problem. Professor Exton showed that it could be done. Using this apparatus, one specialist could deal with a large number of situations at the same time as though he was there present."

"But at what cost to himself?"

It was a question that hung about unanswered.

Exton did not reappear. In his absence, Christine Veck thawed visibly. She took Thorbury into her own office above the control room, where there was a personal view port into the hangar, and filled in the detail.

When he had it buttoned up, he could see that she did not want him to go. In spite of the claims of vanity, he recognised there was a simpler reason. She wanted somebody else

about when Exton came back. Anyone on the site, he could send packing; but a visitor might be more difficult.

Thorbury said, "Well, thank you very much. Just what I wanted. One thing though. Why all the hush-hush until now? I would have expected all this material to be in a prepared hand out. You must have had other enquiries. He's had a lot of public finance."

"That's so. I suggested it, of course. But as you will have seen, Professor Exton is a law to himself. You can understand it, he wants the method proved beyond doubt before there's any publicity."

There was a familiar engine note from the runway and Christine Veck went over to the window. She said, unnecessarily, "He's back," with a harmonic of doubt.

Thorbury had a moment of debate, then he heard himself say, "Well, I'll go. I have all the facts. No doubt, he'll want a *post mortem* with you. Pass on my congratulations. I'll send you a copy when it's finalised."

The decision sprang obscurely from pique. She had made her bed and could lie in it. There seemed no reasonable possibility that he would be in it himself.

There was something in the look he got which could have been disappointment in him, a sense of being betrayed; but she rallied enough to say in colder, professional tones, "Very well. Please check out at reception. We'll look forward to reading your article."

At ground level, he met Exton striding in from the pad. Literally met. Exton brushed past without checking his pace. A heavy, tangible form that caught Thorbury off balance and slewed him round on the ball of his left foot.

He was well-placed to watch Exton's retreating back. A very solid and powerful object in its own right, but the surprising feature had been the full, frontal treatment. It was Exton 256. Narrow-set eyes fairly snapping with malice, lips wreathed back from the ad-man's ivory castles. He was not flapping a riding whip against his boots, but that was only because he didn't happen to be carrying one.

If the good Dr. Veck was a sado-masochist and liked to be dominated, she was in for a special treat.

Thorbury felt uneasy. He had driven twenty miles and had stopped off for a meal, but he had not enjoyed it. He could not get the unspoken appeal out of his head. He told himself that he had imagined it. He told himself that even if he had not imagined it, it was none of his business. Finally, he told himself that he could not have done any good anyway. Eventually, he would have had to leave and she would be on her own with Exton.

She must like it or she wouldn't stay. Also, there was a whole team there to appeal to if there was any trouble.

What trouble could there be at that? There were plenty of awkward bastards like Exton about and their associates had to learn to live with them.

He even drove off on his journey for another two miles before he found he was making a U-turn to head back.

It was dusk when he reached the airfield and he stopped the car and got out. Back on the site, he felt that he was being stupid. There was nothing he could say to excuse a second visit.

Across the overgrown strips, he could see two lights on in the complex. A mini-bus left the door of the hangar and began to race towards the gates. He got back into the car and busied himself with a map.

When it passed, he got a glimpse of a number of familiar faces. Naylor was there and Pete. A man making jokey play with a trilby hat could be the disorientated Bodill.

The team was off to celebrate a victory. Given special leave no doubt by the ganger. Leaving him a free hand for any sinister enterprise.

God, he must be going soft in the head. If she had any reason to fear for her safety, she could have gone with them.

More lights went on in the hangar.

Thorbury turned in the gate. Having come so far, he

would at least say hello again. Claim to have left his cigarette case in the washroom.

By the time he reached the outbuildings every light was on in the hangar. He closed his door quietly and the lights went out as though triggered by that simple act.

High in the ancilliary structure that housed the admin wing there was one still burning. Could be Christine Veck's office. He envisaged the twists and turns of the staircase. Very likely at that.

Courtesy lights on the landings were enough to climb by. The whole place sounded hollow under his feet. It was a time for illusion on the grand scale. He had stepped out of character and felt the strangeness of it. If she was nervous, she would have every excuse to mistake his motives. He imagined her reaching for the telephone to call up the gendarmerie.

For one who waits, it is easy to mistake the beating of your own heart for the hoofbeats of your friend's horse. She would hear his steps crossing the landing. He felt like a ghoul.

Knock quickly then. Make it plain the relief column was at hand. No dice. He opened the door with the suave, cigarette-case bit on the top of his tongue. The room was empty.

Not long empty at that. There was a distinct pollen cloud about, redolent of the owner. Pleasant enough, with a trace of sandalwood that was to his liking; but no substitute for the comely doctor.

Nor was there much in the way of personal artifacts to fill out the profile sheet. It was kept very tidy. Not a stray paper clip. A closed, buff file was placed with mathematical precision in the centre of the grey, L-shaped desk. An obsessionally neat room. The orderly burrow of a very well-regulated female.

Thorbury went right in and stood by the table. The small viewing port into the hangar was showing some light. He crossed to it and looked down into the lab.

Christine Veck was spotlighted in the irradiation booth. But it took a count of five to establish that the changeling was indeed the smooth doctor her own self.

Hair, free from its electrum clip, was swinging like a pale, elastic bell. Remnants of her apricot coverall were whipping about like so many carnival streamers. She had taken off her shoes and was using them to beat at the invisible, transparent walls.

As Thorbury established identity, a duplicate glowed to life, two metres to her left, busy on the same frantic ploy. Then another. It must be Exton, setting up his own Venusberg. But from the panic motion of the subject, it was no straightforward investigation.

Thorbury raced for the stairs and hoped he could find the way to the operations room. Two false turns and a mounting sense that time was not on his side and he came out on a corridor he remembered. Then he saw the door.

Over it, a glowing panel said TRANSMISSION ON—KEEP OUT. It was reinforced by a simple precaution, the door was locked.

He put his shoulder to it. Not a move. It was a time to regret that he had not developed the right physique for the life of action. Which raised another point. Even when he got inside, he was not the man to tackle a burly maniac, who, rumour had it, had the strength of ten.

He looked round the landing for a lever. Waist high on the wall beside the door was a glass-fronted fire-alarm point. Inside was a push button and a small axe on clips. He whipped off a shoe, broke the glass, pressed the alarm, and plucked out the axe.

A metallic clatter broke out on every level. A strident, nerve-shaking accompaniment to his frenetic battery at the door. It brought in harmonics of urgency and terror, that gave an adrenalin boost to his arm and when he broke through, he had lost one civilised skin at the least count.

Exton was hunched over the centre console, staring out at a fantastic panorama of frenzied Vecks. The prototype

was still trying to claw a way out of the main booth and none of the others had found a better way of passing their ration of time.

Thorbury shouted, "Exton. Let her go."

Exton swivelled from the desk and the face had no trace left of its original. He turned briefly back to the console, slammed over the irradiation rheostat into its red quadrant and then was out of his seat coming across the room like a tank.

Thorbury heard himself scream and threw the axe.

The demoniac hammering of the alarm bell was still going on. Thorbury looked stupidly at the man on the floor. There had been a hiatus, but for how long?

Through the observation window, he saw that Christine Veck's multiple persona had gone into a crescendo of activity. A whirling ballet of forms.

He stepped in blood to reach the console and shoved the control lever over to FIELD OFF. Then he reversed every setting he could find.

The hangar went dark. Then houselights came up and the scaffolding was in view with no visible residue of the booths and only a small heap of apricot fabric topped by a small froth of black lace on the floor of the main capsule to show that it had had an occupant.

Thorbury found the entrance at floor level and began to climb up towards the platform. The alarm bell was still making its iron-tongued din. He reckoned it would be heard in the village. Surely, before long, somebody would come and take the matter out of his hands.

On the platform, he picked up the fragmentary coverall. The only positive statement to make was that she was not in it. If the bell would stop, he might be able to think. He saw his own reflection in an angled mirror and then a receding duplicate and then another in infinite recession. Himself looking at himself, looking at himself. He was so preoccupied by it, that he did not hear her bare-foot entry from behind a prism.

But he saw her appear in his multiple world. She had a long triangular shard of broken mirror held high above her head with both hands. A pose which underlined the thesis that true beauty of line is only created by the figure in action.

Her face, though incapable of looking anything other than beautiful, was transfigured by maenad exaltation.

He was anyway out of programme. He could only watch, like a fascinated rabbit, as she struck down into his back and all his images followed the lead of their original and keeled forward before his clouding eyes.

THROWBACK

by

SYDNEY J. BOUNDS

Outmoded, an anachronism in a world of telepaths because he was not one, they made him Keeper of the Museum of Language—in itself something of a joke.

THROWBACK

THE Museum of Language soared pyramidally for thirty storeys, its base enclosing an area of nine hundred hectares in City centre; a warren of corridors and galleried chambers, each level interconnected, piled high with books, tapes, and microfilm that overflowed through attics and down into cellars. It was a place of gloom and dusty silence, visited in the rainy season and by children out for mischief. A mausoleum dedicated to, and completely filled by, words—written and spoken—from the time before the Great Change.

Into this silence came the padding footsteps of the Keeper of Language, a gangling youth of twenty years with tangled hair. Preceding him, like a mischievous echo, the scamper of tiny feet. These hushed as he came to a chamber signposted *Literature* and began to hunt among the shelves, a frown creasing his pimple-spotted face . . .

"Should be right here," he mumbled, "saw it two-three days back, know I did." He had a habit of talking to himself, unconsciously seeking to destroy the endless silence. Frown-creases deepened as his gaze travelled the shelves a second time. "Everything out of order . . . those damned kids again."

He turned, raging: "Come out and show yourselves! What have you done with my *History of Literature?*" The patter of racing feet echoed along the labyrinthine corridors, fading fast. He glimpsed fleeting shadows before they were gone.

He'd never catch them, knew better than to waste his time trying. Scowled and grumbled, "What's it matter? Complain to their elders and get promises it won't happen again. Till next time. You can't change kids—seems like

their only fun in life is upsetting the Museum's filing system." He was past caring, but when he wanted to lay hands on one specific book in a hurry—for his weekly recital—it was infuriating.

Kids. Experience had taught him not to expect any contact with them. They spied on him constantly. Natural. He was a curiosity, to them a freak, but they shied off fast if he tried to corner one, talk to them.

A memory returned, racking him. He had been very young when his own elders decided to send him to Schooling: it had been in the nature of an experiment, but more than that for him. A trial. Sheer agony. He sat in their Circle, encased in sound, blank to their questing minds, children and tutor alike. He sweated even to think of it now. He'd just sat there, mouthing sounds into their silence. No contact at all. Except that they could see him, he might not exist. The experiment had been painful, lasted only a few days. Then his elders had taken him away and raised him on sound tapes.

He put the remembrance from him and reached down another book from the shelf, blindly. Glanced at the title: *Great Romantic Poetry*. He'd already decided on Literature this week, so it would do. *They* wouldn't know the difference anyway.

Sometimes he wondered why he bothered to go through with the farce. He could get out of it easily enough. They'd agree to cancel, he knew. They agreed to almost anything he asked. Kindness itself. But what would he have left?

Nothing.

His gaze, misting, rested on the wall chrono and he saw that he had less time than he'd thought. He took a down escalator and began to hurry through a maze of passages towards the recital hall, turning pages as he went. Forty minutes was his usual stint; in prose, two or perhaps, three, chapters. How many verses?

Calculating as he turned the pages, he was only vaguely aware of high tapping sandals ahead of him, a blur of

figure, before he collided with yielding flesh. The girl turned, bewilderment writing a question-mark across her face, eyes concentrated on him—and getting no answer.

He mumbled, "I'm the Keeper."

Her face cleared in understanding, and something else—the question-mark was replaced by pity. Her speech came slowy, uncertainly, each word formed with unaccustomed effort. "Of course. I should have realised——"

"But your sort knows without looking where everyone is, don't you?" His words snarled out, almost a shout, in reaction to her pity. She winced at the loudness and he regretted it. She was near enough his own age, with dark hair and luminous eyes, a hip-length dress tight across budding breasts. His pulse-beat quickened, the body not knowing it was useless, that biology no longer had the last word in mating. *Last word,* ironic phrase that, he thought bitterly.

The girl sensed instantly how she'd hurt him and tried to make it up. They all did, parrot-fashion; he could guess her exact phrasing, even before the slow words tolled.

"Variation is good for the species——"

"But torture for the individual!"

That startled her. They weren't used to him snapping back like that, but their pity was becoming increasingly hard to take. Her pity especially.

She said, slowly: "I am D'Arqeve. I am going to your recital. What is the subject, please?"

D'Arqeve ... Dark Eve. Her name would be related to some mental aura they alone sensed, yet still it suited her.

"Romantic Poetry." Irony again. Here was the girl and he had the feeling. If only he were a poet, to put into words how good it was to walk beside her, observe the curve and sway of her body, distill her fragrance. He had few contacts with girls, yet with this one he felt at ease. Useless. It would be different if he were as they ... but he knew a mating would never be sanctioned by the elders. He was the only one of his kind and they didn't want more throwbacks...

They walked the book-lined corridors in silence, side by side, and he imagined her struggling to find lost words. *They* didn't need words any more. Words were obsolete when they had the perfect communications system, direct mind-to-mind contact. He couldn't even imagine what that was like . . . a tri-D picture perhaps, in colour? A kind of super-empathy, with taste, touch, and scent thrown in? Whatever its form, it was a network linking them all, while he remained an outcast. A throwback. The one man who could not communicate their way.

D'Arqeve stopped suddenly, looked intently into his face. "You have seen the sky? The strange brightness? You can explain it, perhaps?"

He stared back, confused. "I don't get out much." That was an understatement; he couldn't remember the last time he'd seen open sky. (No need to explain he avoided meeting them, the man who was not there.) "What are you talking about?"

She shrugged and moved on again. "I thought you might know—from your books."

"I can look it up," he said eagerly, grasping an excuse to see her again. There were books in the Museum, books about the sky. "Astronomy." He would make an effort to get outside and see what this was all about.

They reached the door of the recital hall and she stepped aside to allow him to enter first. Others were filing silently in, taking their seats. Someone worded a greeting as he passed down the aisle: "Good-day, Keeper."

He nodded back, climbed the few steps to the platform and took his place at the lectern; waited while the hall filled, the door closed.

He didn't need to count. There would be exactly the right number to fill the seats. This was their way of being kind to him, his weekly period of communication. He spoke words aloud and they listened with ears they no longer needed.

He was beyond caring, except for one. D'Arqeve. He

hoped she would understand the words of long-dead poets, relate their longing to his own.

Silence, complete, and into it his words rasped harshly: "This week my subject is Romantic Poetry." He plunged straight into——

"How beautiful are thy feet with shoes,
O prince's daughter!
the joints of thy thighs are like jewels,
the work of the hands of a cunning workman . . ."

His voice thundered, shooting the words of Solomon like bullets among them. Was anything getting across? he wondered despairingly. Speech had atrophied, words lost their meaning. Could they translate crude sound into their own mode of expression? Were they receiving anything except "noise"?

His voice lifted, became harsher. How to penetrate this network of perfect communication? Were his words—beautiful, golden words!—no more than the piping of a reed whistle to their full orchestration?

D'Arqeve sat in the centre front row, her luminous eyes raised and intent on him. She became the focal point of his recital, feeling for her Shakespeare's sonnet as he lashed the silent air, filling it with thunder and roses . . .

"My mistress' eyes are nothing like the sun;
Coral is far more red than her lips' red:
If snow be white, why then her breasts are dun . . ."

Behind the glowing words, bitterness. Tolerated, an entertainment for his successors. The history and literature of all mankind to give them and he didn't exist. A void. He was wasting his time, his life. They had no sense of time, of the past. Their talent linked them inextricably to the present *now* even as it linked them together, limited their experience to the immediate moment of contact. At most

they were aware of fading memory. It was the price they paid.

The lack of any real feeling of communication filled him with despair and he cut short his recital, not waiting for the mellow tone of the gong to end his period. As he sat down there was polite applause. Silently, they filed from the hall; all except the few, as usual. Always a few remained to put their laborious questions. D'Arqeve was one of these.

"The sky," she said. "Can you explain the sky to us?"

Startled, still immersed in his subject, it took an effort on his part to recall her earlier question.

"It is daylight at night," she prompted. "Explain this, please—we are afraid."

"I haven't seen this phenomenon," he answered. "I'd have to read up on it. I can do that for you."

"Oh, yes, do that, please."

There followed other, literary questions and he dealt with them mechanically, his thoughts on D'Arqeve; yet he was aware of a restlessness among them that was unusual. Again, someone asked him about the sky; it seemed to be preying on their minds.

He wished he'd seen this phenomenon for himself. Must make the effort, study the sky, read the Astronomy books . . . his attention wasn't really held. He manoeuvred to stay close to the girl, talking at her with each answer he gave, preventing her leaving. He succeeded. As, one by one, his audience drifted out, he found himself alone with her again.

It was natural that they leave together. Walking the corridors, he said: "Perhaps I can see you home?"

"To see the sky for yourself? *Oh* . . ."

Her face tightened as she looked at him and understood. Her smile vanished. Ice-cold now. "I am sorry. You must know, Keeper, that my elders would not approve."

She moved away, down a side passage, and he watched till she was out of sight. Variation of the species, fine, only he wouldn't be allowed a mate. An outcast, doomed to live

out his days alone. Hands clenched, nails biting into palms, he walked the lonely corridors of the Museum. His Museum. He was trembling.

Silence.

He rode the escalator up to his apartment. He had the largest single building on Earth, given to him, a mausoleum of blank walls and artificial light, and books—milliards of books, filling shelves by the myriametre. He had lived here, alone, since his eighteenth birthday, shut in from them, from the sky ... no point in going out to look at that now.

He reached his door and felt in his pocket for the key to unlock it: the only lock in the city. They respected privacy, but they didn't need locks to achieve it; they knew if one of their kind was inside. But they couldn't sense him; he wasn't on their net.

He dropped *Great Romantic Poetry* heavily on to the table; heavy as his own heart. "Can't bother filing it. Doesn't matter anyway. Kids'll only hide it."

He dialled for food and pecked at it, his hunger not of the stomach. Alone in a room filled with books, filled with the great thoughts of great men down the ages ... yet he lacked one human contact. He stared unseeing at the shelves, remembering the past ...

After his fiasco at Schooling, his elders brought specialists home. There had been tests. Every conceivable kind of test, one after another. Encephalographs. Drugs. Surgical probing. And every conceivable kind of specialist. Psychotherapists. Hypnotists. Even, once, a faith healer. One and all had gone away defeated.

They had even put it into words for him to understand. "We are sorry, there is no hope. You are a genetic throwback. You can never belong to our society. You must learn to accept your handicap, adapt to solitary existence."

It was then he had feverishly studied the history of the Great Change, the mutation of the human species. There had been books written about it, at the very beginning,

before it spread through all humanity and the use of words atrophied. But nowhere could he find a clue to help him. He could not join the club, never get on their network . . .

The memory faded and he sat staring at a wall of books, a wall effectively isolating him from human society. No hope, ever. No hope of a girl, friendship, a mating.

Nothing.

He listened to the silence, sniffed at dusty air, undressed, and slid into bed. Automatically, the room light flicked off. Sleep was a long time coming . . . restless, he thought of D'Arqeve, longing for her. Finally, he slept . . .

And woke again. Or was he dreaming? That sound, that dreadful ululation rising from the streets, surely that was the figment of nightmare? A wordless wail of terror that turned his spine to jelly and set his skin crawling.

He swung bare feet to the floor. Light came on. He was awake; yet the animal howl continued. It could only be the wordless ones. *What . . .?*

He rose from his bed—sure now that something terrible was happening—and padded to a window. Shutters creaked as he raised them. Outside was the night, and night should be dark.

But *this* night was bright as day. He turned to study the wall chrono: three a.m. Yet the sky blazed with light. And he remembered D'Arqeve's questions as he stared down at the street.

Shocked.

The night street, arcanely lit, appeared violently alive. It swarmed and surged with an ant-like mob. Panic-stricken, trilling their eerie cry, they writhed in knotted confusion. He stared down, mesmerised, watching appalled as they tore at each other's flesh, overturned street cars, smashed windows. Jagged glass. Blood flowing. Their fear pulsed out, insidious, communicating itself.

He felt himself affected and drew back. Sudden understanding. Of course, panic would be a very special thing for them; fear in one mind, fear in all. Instant terror, spreading

at the speed of thought. He was viewing the breakdown of society. Chaos.

His gaze lifted. Now the sky filled his window-horizon, a sky aglow with a band of eye-dazzling light extending half across it in a great scimitar-shape. A sun-like ball, flaming tail. Glowing brilliant as a torch.

He stared, awed by the apparition, his mind working only slowly. But still it worked, conjuring up the memory of a book, a picture seen. The ancients had a word for it: Comet.

Struggle to think clearly. Comets had highly elongated orbits around the sun, returned after long intervals. Years. Decades. And *they* had almost no memories, no sense of historical time, no stored knowledge to draw on. So they wouldn't know about comets. One up to him. Who was *homo superior* now?

Wordless screaming vibrated the air, sent shudders through him, set his teeth grinding. He flung on some clothes and hurried along dusty corridors, no longer silent but echoing with disaster.

Searched shelf after shelf. "Astronomy ... must be a book somewhere ... those blasted kids." Finally he found a tome labelled *Comets and Meteors,* flicked the pages rapidly. A picture: the same. Satisfaction.

All he had to do was convince them the thing was natural, nothing to fear. Clutching the book to his chest, he rode the down escalator, made for the main entrance hall. The hair-raising wail was louder, closer. Sounds of wrecking. Beyond the door, a mob milled in blank-faced terror, fighting. Tearing sounds as someone tried to force a way through to him.

D'Arqeve. She saw him and cried out: "Keeper! You must help us."

He lurched forward, using his book as a blunt instrument, caught her by an arm and pulled her inside, slammed the door. He took her to a small room off the main passage, panting; opened the book and showed her the picture.

"What is it?" she asked, her voice small with fear. "The end of the world?"

"No, no. It's called a comet—just chunks of rock and stones, surrounded by gas. Goes round the sun, like Earth, only it swings out farther, takes much longer. Comes back years afterwards. Comets have been recorded many times, see——?" He showed her bewildering astronomical tables. "No danger at all. A perfectly natural phenomenon."

Slowly, she calmed. "I must inform the Council of this. Wait."

She stood rigid, face concentrated. Anxiety. She darted a quick look at him. "It's no good. Fear-waves blank out everything. We must go to the Hall."

He gestured at the wall. "Out there? We'd be torn to pieces!"

"We must still try."

He guided her along more corridors, to a side door. The street was not deserted, but the mob was less dense. Shadows crouched in darkened corners, wailing eerily.

They started off under a sky bright as day, running, dodging. One terror-crazed group tried to stop them; he fought them off, ran on to Council Hall where tormented elders writhed in silent agony.

D'Arqeve shouted: "The Keeper can help—his books know all!"

Attention focused on him as he gulped air into straining lungs, opened his book. The picture held their interest. He recited words, quoted, expounded, and they strugged to grasp his meaning.

He kept repeating, "There is no danger. A natural phenomenon. It's happened before, and will happen again. Listen ... the appearance of a comet in the sky was widely regarded as a portent of impending evil; catastrophes attributed to the influence of comets. Superstitious garbage!"

That hurt. *Homo superior* objected to being called superstitious ... a great calmness descended on the hall. Council

elders relaxed visibly. Utter stillness as their minds united to dominate the panic and inform the people.

It could not have been easy but, after an endless time, the wailing died and again there was silence in the city.

The Council chaiman rose, his face grave. "Truly it is said, variation is good for the species. We are grateful to you, Keeper. Your knowledge is of lasting value and must be made readily available to as many as possible. The ancient study of language must be resumed."

He paused, straining memory for unaccustomed words.

"Students—in particular the young—shall train under you in this forgotten art of communicating with words, in keeping records. I rename your museum : *workshop.*"

Keeper felt D'Arqeve's hand slip into his, press warmly, and he was happy, knowing she would be the first to join him.

THE PERIHELION MAN

by

CHRISTOPHER PRIEST

Farrell's major asset was that he could withstand great heat and had been nearer to the Sun than any other astronaut. That made him a natural for a suicide mission.

THE PERIHELION MAN

ONE

IN the air-conditioned quietness of the office, Jason Farrell was conscious of a noisy spring somewhere at the back of his black leather swivel chair. In the painful clarity of a morning hangover, Farrell was too aware of the sound, the only disruption of perfection in this wasteland of sterile glass and plastic.

"... on the other hand," the man on the other side of the desk was saying, a Mr. Edward Law, according to the discreet label on his outer-office door. "On the other hand, we could just give you a lump sum in lieu of your pension, and that would be that."

"Yes," Farrell said.

"Well, which do you prefer?"

Farrell tried hard to concentrate. His career was at stake now, decided on by office-bound civilians like this.

"I don't see why I have to be taken off flight-duty," he said. "I'm fully recovered and as fit as the next man. My record's good, isn't it?"

Law had a neat pile of quarto paper on his desk and sat with his left hand resting on the top. His fingers tapped slowly.

He nodded. "Your record's good, but I'm afraid your psych-count isn't. It seems that the accident had brought out one or two deep-laid psychoses in your behaviour-pattern."

"What the hell do you mean by that?" Farrell demanded, sitting forward sharply.

Law looked at him calmly.

"If you want it in plain English, you drink too much."

"I've been on leave for six months. You expect me to live it up on milk?"

"We're not interested in effects, Captain Farrell. We think more of causes. The inarguable fact is that within two weeks of being discharged from the Alliance military hospital you were arrested twice for being disorderly. Since then, you've evidently kept out of the way of the law, but your periodic check-ups have shown that you are developing alcoholic tendencies."

"That's crap, Law," Farrell said. "So okay, I do drink a lot more than I did, but I'd be able to stop when I went on flight-duty."

"It isn't only the drink."

"What then?"

Law picked up the top sheet of paper and looked at it. He put it aside and took the second sheet.

"Your nerve-reactions are down to 170 on the Cornelius scale. The minimum requirement for space-pilots is 210. Your eye-sight has developed a minor astigmatic variable of just over 97 per cent. A pilot must have 100 per cent eye-sight. The surface electricity of your skin when stimulated by adrenal fluid is insufficient: more than one unit too low. Your passivity rating has dropped sharply and you have developed an aggressivity-quotient of nearly 72. Do you want to hear more?"

"Is there more?"

Law nodded slowly.

"You're finished as a pilot, Farrell."

"But, hell, that's hardly my fault."

"We're quite aware of that. Your case has been the subject of a lot of discussion. The Alliance is prepared to be financially generous to you, but can do no more."

Farrell sat back again in his chair wondering why he hadn't guessed this would happen. God knows, he'd had plenty of advance warning. The long leave, the dozens of medical examinations, the continuing delay in receiving a posting.

For the last two months he'd been in Nassau, soaking into his body as much wine and sunshine as he could manage. From the relative normality of a Bahaman beach, the sun had felt benign and Farrell had been able to convince himself he could come to terms with life again.

"Of course, the Space Administration will be sorry to lose you. You were, I believe, one of their top pilots."

Farrell said: "No, that was Tretchi."

Law shrugged. "I think he used to say the same about you."

"Maybe."

The other man nodded, in a semblance of knowing and understanding. Farrell looked at him with a mixture of contempt and bitter amusement. Law had probably read all that crap that had appeared in the papers after the accident, about Jerry Tretchi dying in space to save his life-long buddy Jason Farrell from a death worse than death. The truth of it was, Farrell thought, that he and Tretchi had hardly known each other before the incident, although they had gone through training at about the same time. Tretchi's photographs had passed into the currency of popular heroes, and his face was now familiar to Farrell. Before the accident, though, he would not have recognised him any more than a dozen other of his fellow-officers.

Tretchi had just happened to be around at the time, that was all. It was a pity he'd died, but that was the way it was. Jerry Tretchi was a dead hero, and Jason Farrell was a live has-been.

"So we come back to the alternatives facing you," Law said. "The EASA is willing to find you a good job in one of their Earthbound technical establishments, or even perhaps on one of the Beampower satellites. If this doesn't suit you, you can take advantage of our placement office and find a job in some other industry. Or, as I said earlier, you can just opt out altogether and we'll give you full gratuity and pension rights."

Farrell stared at the man for a moment. Had he, Farrell

wondered, ever been out into space? How could a man talk in terms of money and jobs when a career in space had suddenly ended?

Farrell was no romantic and scoffed at the so-called poets of the space-age. Their lies of verse about the loneliness of the skies and the stellar majesties of space hardly scraped the surface of what it was all about. To Farrell it was a very personal thing, something he'd never managed to communicate to the other spacemen he'd known, even though they all had their own reasons for going into space. It was nothing he could ever say in words, nor convey to others. Something about leaving a planet so far behind that it became little more than a point of faint light . . . then returning to it, and seeing it grow in your forward scan-screen. . . . It was a break with security that carried a kick like sex and it never wore off.

When he died, Farrell had once promised himself, it would be at the station on Mars. Lonely, it was, and perhaps a little primitive too. But the sight of Earth in the deep-blue morning skies of Mars was something he'd seen once and he hungered for it again.

"Well?"

"You want me to tell you now?"

"If you want time to decide, it's up to you. But we'd prefer it if you'd tell us now."

"There's no way round it?"

Law shook his head slowly.

"Not even a non-piloting job in space?"

"No," Law said. "You know the regulation as it stands now: Every member of a ship's crew in space must conform to maximum health specifications whatever their allotted task. There is nothing, absolutely nothing you can do, Captain Farrell, to get back into the Alliance force."

"I see."

Farrell looked at the other man and found his composure suddenly irritating. He sat back in his seat now, half in profile, so that he looked at Farrell from an angle. His hand

rested again on the pile of papers, those papers that stood between him and his life, and his fingers tapped.

Farrell leaped to his feet in a surge of anger that surprised himself and leaned forward across the desk.

"Listen, you smug bastard!" he shouted. "You don't give a damn about what happens to people like me. Just because I'm not a bloody hero like Tretchi, I'm penalised!"

"Sit down, Farrell." Law had raised his voice too.

"No! The Earth Alliance has full control of spaceflight and you know it. If you can't fly for EASA, you can't fly. And you talk about forms and pensions."

Law reached across his desk and pressed a button.

"This hysteria you're showing now is part of the reason you've had it. It was the outcome of the accident. We can do nothing. We're sorry."

Two uniformed Planetary Marines had come into the office and they saluted to Law.

He said: "Captain Farrell's just leaving."

Farrell turned and looked at them. "So I get an escort from the building, do I? Like I'm some troublemaker."

Law said, "Don't make it worse. This isn't anyone's fault and it's certainly not mine. You're allowing your instincts to overrule your judgment. If you went into space now you'd be a hazard not only to yourself but to other people. You've had it Farrell. You've had it."

He nodded to the two Marines who stood to attention. Farrell looked at Law for ten long seconds, then turned and walked towards the door.

"Let us know within a week, Farrell. We'll do our best for you."

Farrell said nothing and walked out of the office. Although the Marines followed him through the building, he ignored them. Down on the street he grabbed a shuttlecab to the airport, and took the first strato-jet back to Nassau.

Two weeks later he was reconciled to his new life,

though still had no idea of what he was going to do with it.

His first instinct on leaving the Earth Alliance Space Adminstration building had been to go on a drunk, but his pride had intervened in time. That, he'd told himself on the strato-jet, would be precisely what Law would expect him to do. If he had no alternative about his future, then he'd be damned if he'd conform to what was expected of him.

In Nassau, his life quickly reverted to what it had been before Law's summons to the EASA, but without the alcohol.

During the day he would alternately swim in the warm blue Caribbean, eat with little interest of the local foods, and lie for hours at a time in the hot, white sunshine. He could not get enough of the sun, thirsting for it in the night and gorging himself in its liquid heat during the long days. By now, his body was a shiny, chestnut brown and the object of admiring curiosity from the many young women using the same beaches. Oblivious to their presence, Farrell ate and swam and slept, trying to lose the irrational urge to get back into space.

Before his interview with Law, Farrell's patience had been fed by the knowledge that everything was a matter of time. Now, in one blow, his hopes ruined by the laws of medicine, impatience was a sensation not one quarter of what he fought down.

And two weeks later, the memory of the metal ships in the spaces between Earth, the Moon, Mars, and Venus was a hard, unpleasant knot that he was able to ignore most of the time.

The thought of Venus roused in him the vague, uneasy sensation most spacemen experienced at the mention of that silent and enigmatic planet. To date, no man had set foot on the clouded planet; or at least perhaps man had, but had not lived to tell the story. For after the first six ships from Earth had disappeared without trace, taking with

them over a hundred and twenty crew-members, man had given Venus a wide berth.

The wild stories that had sprung up over the years and the legends passed on down the generations of spacemen, attributed to Venus a mantle of myth and mystery that survived even until today.

The Earth Alliance spread across the inner reaches of the Solar System, encompassing Earth, the Moon, and Mars. On the Moon, several cities existed, living by the raw-material mines that the Moon's rich crust yielded. On Mars, a solitary scientific station in Syrtis Major expanded slowly year by year. One day, too, there would be cities on Mars; sometime, centuries away perhaps, Mars would be terraformed completely and man could use it as a second home. Now expeditions pushed out into the asteroids. Man's spreading through the Solar System was slow, but it was sure.

Only Venus remained defiantly outside man's reach.

It was near Venus that Farrell's accident had happened. He had been captain of a ship with fifteen men aboard when an explosion had torn at the central hull. In seconds, everyone on board, with the exception of Farrell and his second-in-command who had been in the control-capsule at the time, had been dead. Drifting without power or control, Farrell's ship had started to fall into the sun . . .

He opened his eyes sharply, as a shadow fell across his face.

"Captain Farrell?"

Farrell squinted up. It was a man, his head coronaed by the sun so Farrell could not see his face. He rolled over.

"Yes."

The man sat down on the sand beside him. Farrell sat up and looked at him.

He was dressed, like Farrell, in shorts. His body, though, was white and unhealthy-looking in the bright sunshine. Farrell thought: he shouldn't be in the sun like that, he'll catch sunstroke.

"On holiday, Captain Farrell?" the man said.

"How did you know who I was?"

The man laughed. "Instinct, I suppose. Anyway, I asked at your hotel."

"Are you from EASA?"

"No. Why did you ask?"

Farrell said, "For some reason I've been expecting them to come here."

"I don't think they'll do that, Captain. I've told them I was coming to see you. Although they don't exactly approve of what I want to talk to you about, they won't be interfering."

"What do you want?" Farrell said in a way that was just this side of impoliteness.

"I've come to offer you a job."

Farrell closed his eyes and lay back on the sand.

"I'm not interested. I'll worry about work when the gratuity runs out."

Beside him, the man started scooping up handfuls of the fine white sand and making furrows.

"I think you should listen, Captain Farrell. It's a job in space."

He opened his eyes.

"You're not serious."

"Why shouldn't I be?" the man said.

"If EASA really did know about this, they wouldn't let you within a hundred miles of me. I'm banned for life, by courtesy of the medics."

The man glanced round, looking at the other people on the beach, some of whom were within earshot.

He said to Farrell: "I'm serious Captain Farrell, but I'd rather we didn't talk about it here. Could we walk?"

Farrell climbed to his feet, and grinned.

Two

"My name's Jervis, by the way," the man said. "Nicholas Jervis."

Farrell said: "Glad to know you, Mr. Jervis."

They were walking along the edge of the sea, where tiny wavelets spread across smooth pebbles. Down here by the sea, a soft wind blew against their bodies, tempering the harsh sunlight.

Jervis put his hand in a pocket and pulled out a blue tee-shirt made of a light fabric. He slipped it on over his chest and Farrell mentally felt relief, knowing well enough the harmful effects of too much sun.

He said, after they had walked well away from the crowd, "Excuse my eagerness, Mr. Jervis, but you mentioned a space job."

"I take it you're interested already?"

Farrell grinned again. "If it's in space, it's enough for me."

"I think you should know more about it before we settle the deal," Jervis said. "Not many men would do this."

"Well, try me."

They'd left the main beach and had entered a small cove cut out of the high cliffs that rose here. They stepped over small rocks that now replaced the pebbles along the shore.

"Before I say anything else," Jervis said, "I should tell you that I represent the Disarmament Preservation Administration."

"I've not heard of it."

"I shouldn't think you have. Very few people have, indeed. It was first formed about eighty years ago and became a dormant entity about ten years later. And it stayed that way until only recently.

"You may not know this, but during the Cold War and its after-effects, during the later part of the twentieth century, many hundreds of satellites were put into orbit

around the Earth. A lot of these were for ostensibly peaceful or scientific purposes, but not all. Both sides put into orbit several hundred nuclear weapons, as well as a large quantity of micro-bacteriological weapons.

"When the Alliance of Nations was eventually formed to take over world government in 2047 everyone tried to keep quiet about these devices. When the secret finally broke there was a hell of a storm and the DPA was formed."

Farrell said, "I take it the satellites weren't the only reason."

"No. Of course, once everyone disarmed, supervision by the Alliance had to be extremely close for many years. The problem presented by the satellites was much greater. The bacteriological ones, strangely enough, were the simplest to dispose of—the germ-plasma had a determinable life-span and after that they were declared harmless.

"However, the nuclear devices were in most cases made of materials with extremely long life. Most of them are still in perfect condition today."

"Today?" Farrell said.

Jervis nodded. "It was eventually decided that by this time the Alliance was so strong that there was nobody on Earth who could or would be able to use the devices. Under the circumstances of the time, the best policy seemed to be to leave the satellites just where they were—safely in orbit. This was done, the DPA was disbanded, and an annual check was conducted from space that all the satellites were still there.

"This was done until last year. Then it was discovered that about a hundred of the satellites were no longer in orbit."

He paused to let this sink in.

"Then who's got them?" Farrell asked.

Jervis shrugged. "I don't know and neither does the Council of the Alliance. The DPA was rapidly re-formed and its been our baby ever since."

"What's the position now?"

"As soon as we found out, steps were taken to get the remainder back down to Earth. This was completed in three months, done at crash-priority level. But not before another two hundred and fifty had disappeared."

Farrell whistled. "How would they be stolen? By matching velocities?"

"Yes. Nothing could be easier. It could almost be done by some enthusiastic youngster in a space-yacht. Anybody, any bloody person on Earth almost, could have done it. They were there for the taking and someone took them."

"So where do I come into it?"

Jervis looked at him. "We want them back."

They had stopped walking now and were standing on a large boulder that lay by the water's edge. Waves splashed gently against it. Farrell sat down and dangled his feet into the clear, warm water.

"Do you know where they are?"

Jervis said: "Not until three weeks ago, we didn't. But we know where most of them are now. An astronomer saw what he thought was a large cloud of meteors or minor asteroids occulting the sun, looked more closely—and there they were."

Farrell looked up in surprise.

"Whoever's done it means business," Jervis said. "There are two hundred and fifty thermonuclear bombs orbiting the sun between Mercury and Venus and there's a spaceship guarding them."

Minutes passed. Farrell was watching a tiny piece of bright-green seaweed below the surface of the water. As the waves went backwards and forwards over it, it waved its fronds to and fro.

Finally, he said, "I'll do it, on two conditions."

"Name them."

"One, you guarantee me a space-side job afterwards until normal retirement age."

"Done."

Farrell looked surprised, then pleased.

"Secondly, you tell me why the Council of the Alliance doesn't send out the EASA in force and blow the ship to stardust."

Jervis said, thoughtfully, "I expected you to ask that. The answer isn't easy.

"On this issue, the Council is in something of a political pickle. You see, it has had to accept full responsibility for the theft of the devices. The sins of the forefathers and all that. If the bombs hadn't been allowed to remain in orbit when they were, nobody would have been able to steal them. So the Council itself, which has the final say in the administration of the Alliance, is in no position to take a strong line here.

"In the second place, there is a strong movement at the moment in the Asian countries for self-determination. This sort of thing has happened before and the Alliance has survived it. But coming at this moment, when the culprit country or vested interest is totally unknown, it is felt that a move of force against this spaceship could endanger the whole structure of the Alliance itself if in fact one of the Asian countries were responsible.

"So whoever goes out to tackle our unknown friends in the spaceship must be totally discreet and acting alone. He must not fly under the Alliance colours, nor appear to represent the Alliance in any way. On the other hand, he will have the total resources of the Alliance behind him."

Farrell said: "Is that a hint about a fee?"

"It is," Jervis said gravely.

"Well, you can forget it. I wouldn't do this for money. You can cover my expenses if you like, but that's all. It might sound trite, but if this is a way back into space, I'll take it."

Jervis said, "I assume then that you have no objection to starting almost at once?"

"No, of course not." He climbed to his feet, and the two men started back towards the main beach.

A thought struck Farrell and he said, "Why did you come after me in particular, Jervis? There must have been dozens of better pilots in the EASA you could have talked into doing this."

"There are, of course. But you have one advantage over all the others. You're rather unique you know, Farrell. Do you realise that you are the one human being who has been closest to the sun and lived? When Tretchi rescued you, your ship was less than sixty million miles from the sun.

"You can withstand heat, Captain Farrell. We don't know why, but your body is burn-resistant. No one else in EASA could get anywhere near that ship."

Farrell said: "But what——?"

"I know what you're going to say. It's what we all want to know. *What* is inside that spaceship?"

Three days later Captain Jason Farrell, newly re-commissioned into EASA, blasted off from Beampower Station No. 18 and began the long drop down into the sun.

The ship he flew, which he had immediately christened *The Lawless* more as a gesture to his desk-flying adversary at EASA headquarters than anything else, was a converted Alliance transport. He was familiar with the type, having once bucketed one all over the Martian sky for several weeks, but this had been converted almost out of all recognition.

For a start, its hull had been fined down and glazed, so that it shone like a mirror. Then, over this original hull they had laid on fifteen separate outer skins, made of black non-inflammable fibre. When he'd asked one of the technicians at Beampower 18 why they'd stopped at fifteen, the man said: "You were ready to leave. We could have added them almost indefinitely . . ."

When Farrell approached the spaceship guarding the bombs, he'd be coming down out of the black. If even a square foot of his insulated hull showed at the time he'd stand out like a candle in a darkened room. The black outer

hulls would vaporise off relatively quickly, but until they were all gone he would be almost invisible to any observer on the spaceship.

Around the cabin, the technicians had rigged heavy radiation-shielding. Enough, Jervis told him, to keep out almost anything the sun could throw at him. His main problem would be the heat—and the glazed hull and refrigeration plant should be sufficient to keep that down to levels he could survive.

The second major modification they'd made to *The Lawless* was the armaments. They'd given Farrell the choice of virtually every portable weapon to man, but he'd finally plumped for a vacuum-torpedo tube slung underneath the belly of the ship and an array of self-aiming heavy lasers. If he had time to stand and aim at anything hostile, he'd argued to Jervis, he could use the torpedoes. If he had to run, or scrap around in weightless conditions, he'd need something relatively light for in-fighting.

But privately Farrell was hoping he wouldn't have to use the weapons.

The third modification was definitely not to his liking. The normal ion drive engines had been ripped out and replaced by a Beampower pulse engine.

"What the hell's that bloody thing in there for?" he'd howled at Jervis when he saw it. "If I have to run for it, I'll need to change direction at will."

Jervis had held out his fingers and patiently counted off the reasons.

"One: we've had to take out the navigational computer to expand the hold. At the same time we put in Beampower shields. Two: without a computer you'll never find what you've gone for. Three: we aren't sure a computer would work that near to the sun anyway. Four: an ion drive engine wouldn't be powerful enough to get you away from the sun afterwards. Five: you won't need to carry inflammable fuel near the sun. Six: you——"

"All right, all right," Farrell had said. "You win."

The snag with Beampower, or paser to give it its more widely-used name, was that you could only go in one direction. That is, in whichever direction the Beam was pointing and no other. If the Beam moved, then so did you. A paser did for sub-atomic energy what a laser did for light. A narrow beam of energy was laid across space in any chosen direction and as many ships as required could blast up and down it without carrying their own fuel. The difference between a conventional rocket and a Beampower pulser was analogous to that between the old steam-engines and the later electric locomotives. Normally, Beampower was used for regular trade-routes between planets and satellites, but because of the ever-changing conjunctions of the planets, the Beams were transmitted from specially built satellites around the primaries and which homed in on each other constantly.

But before a Beam was laid, a receiving station had to be built. So the conventional rockets still blasted their way out to new frontiers and only afterwards could the stolid pulsers follow.

"What are you going to do about a receiver for the Beam?" Farrell had asked. "You can't tell me you've already built one."

Jervis and the technicians had laughed.

"We don't need one. We just point the Beam into the sun . . ."

There were other disadvantages too, ones that Farrell hadn't foreseen. The first one was that the technicians could not point the Beam directly towards the spaceship. If they did, the Beam would be detected immediately. Not only this, Jervis had added, but if the nuclear piles inside the hydrogen bombs were exposed to an unshielded Beam for more than a few seconds they detonated.

So although the Beam could be directed with pinpoint accuracy, the one that Farrell would ride would deliberately miss his target.

To further complicate matters, if he was forced to leave

the Beam he could do so, but his batteries would last only minutes.

"That," Farrell had observed morosely, "would make dogfighting a peach."

Once away from the Beampower satellite orbiting the Earth, Farrell felt immediately better. In spite of his slightly grudging attitude towards Jervis and the technicians he had to admit that *The Lawless* handled like a dream. The feeling of solid accelerative push was comforting to Farrell and although the ship could move with perfect safety on automatics, he spent several hours at the controls, just savouring the feel of it.

Away from Earth . . .

Farrell watched his rear scan-screen with fascination, seeing the brilliant globe of Earth begin to dwindle behind him. However far down into the sun he went, the Earth would remain a brilliant star at zenith.

Down into the sun . . .

As once before, in fifteen hours of pain and fear, Farrell had fallen in the wrecked remains of his ship, into the sun.

THREE

THREE days away from Earth, he reversed the polarity of the pulsers and began the long deceleration. He did this early, wanting to be at a manoeuvrable speed well before reaching what he was beginning to think of as the combat zone. Also, he was unsure of the effect of the sun's gravity on his overall velocity.

Jervis had told him that the nuclear devices and their mysterious watchdog spaceship were orbiting the sun at a height of about sixty-five million miles, or just inside the orbit of Venus. The sun's effect at this distance on even a properly-refrigerated spaceship would be most uncomfortable.

Alone now, Farrell began to think again of the accident.

Already, the refrigeration equipment on *The Lawless* was full on and the temperature was slowly beginning to mount. The temperature of the outermost fibre skin was high, nearing 250 degrees. Melting point for that was 600.

He shut his eyes and relaxed on his deceleration-couch.

Hawkins has brought him some of the ersatz coffee in which the ship specialises. Everyone on board is feeling edgy because of that clouded planet that's looming up in the starboard scanners and nervous jokes spatter across the crew's quarters. Only that cheerful bastard Farrell doesn't show any signs of nerve and he just flies on. Only, thinks Farrell, they can't feel this band of nervous sweat around my waist, or that saliva in my mouth. Then the ship explodes and Hawkins is thrown against him with his leg torn off at the hip-bone, and his blood is everywhere. Somehow, the control-capsule is airtight still and the tiny coolant system is working. Apart from that there's silence. Oh God, let it be quick. Slowly, the ship starts to tumble . . . mercifully away from Venus, but into mother sun. Hawkins grins up at me, his lips are white with pain. I look at the poor swine helplessly, apologising profusely and uselessly before blowing his brains out with the emergency-pistol. Hawkins still grins at Farrell and in the cramped space there is nowhere else to look. And down and down, wheeling faster now, as the temperature starts to mount and the coolant system begins to make a whining noise that must surely mean it will pack up. What is the highest temperature man can sustain? thinks Farrell and I puke into my lap and across Hawkins' grinning face. The dosimeter on the bulkhead is in the red, my gamma-count must be impossibly high. Regulation two hundred and fourteen I must report for hospitalisation at the nearest medical base equipped with standard equipment serial number . . . and I rip the dosimeter from the wall and smash it against the instrument-panel making my hand bleed and the blood too drips on poor Hawkins who only grins. Farrell's eyes lose vision in the fourteenth hour and his hands lose sensation. Only

his ears go on working in the killing heat and the deathful silence. Flocculent saliva specks his lips and he defecates constantly into his uniform. The barrel of the pistol is in his mouth and his finger is tightening on the trigger and his foot is braced against something soft that is probably part of Hawkins' leg, when I hear a crunch of metal on metal and the wheeling stops with a lurch that throws me violently to the right and I smash my head against the other bulkhead and I think I'm dead. Someone grabs me and I feel the burn of hot metal against my skin where a vacuum suit touches me and everything starts to howl.

And Farrell opens his eyes in a scoutship, where a man called Jerry Tretchi lies dead from extreme heat-exhaustion . . .

And Farrell opened his eyes and found he was sweating.

On his sixth day, Farrell was coasting in the gravity of the sun, using his decelerative pulsers to maintain control and speed. He crossed the orbit of Venus in the plane of the ecliptic, relieved with the instinctive and irrational tradition of the spaceman that the planet was millions of miles away and in sight merely as a disc of light whose crescent-shaped brilliance was dimmed only by the immensity of the sun.

What of Venus? he wondered. Were the stories of it based only on superstition? Could it be inhabited, as some people and most spacemen guessed? If so, any intelligent life-form would have to exist either in buildings or caves far underground; or on oxygen-starved plains where winds of carbon-dioxide reached three hundred miles an hour and in impossible temperatures.

Or perhaps the early losses of men and ships could be accounted for by accidents. There was talk, even now, of getting up a seventh expedition.

The explosion of his own ship left many questions unanswered.

But Farrell's main concern now was the sun.

Occupying the whole of his forward scanner, stopped down to a gain-rate of virtually nonexistent proportions, the white disc of the sun dominated Farrell's vision and thoughts. Already the outer skin of his ship had dropped away and the second one was nearing 600 degrees.

By dead reckoning, the location of his objective should be somewhere here. There was very little Farrell could do himself. His scanners would pick up any metal in the vicinity, and to use his eyes on the vision-screen the whole time was not only superfluous, but tiring too.

Again, aware that the crucial minutes were approaching, he lay back on his deceleration couch and tried to relax.

In minutes, he was startled by the abrupt ringing of his alarm. He ran to the controls and took his seat.

The scanners reported an object or objects some five miles to his port. Farrell mentally offered apologies to Jervis for doubting that the paser could be used with such accuracy. Across twenty-seven million miles of space and to be five miles out and intend to be, was the nearest thing to scientific precision he was ever likely to experience.

He checked his velocity immediately and adjusted the deceleration-pulses of the engine to exactly match the pull of the sun. Now, to all purposes, he was in the same orbit as the object.

Farrell glanced at his hull-readings and saw to his alarm that in the last few minutes the ship had lost another six of its skins. He was now down to seven and even as he watched the dials another one shrivelled away. He thought quickly. At that rate, and Jervis had warned him they would vaporise progressively quicker the more that were lost, he had about ten minutes left. There was, quite literally, no time to waste.

He switched off the Beam receptors and cut in the bank of solid-state batteries, then moved forward out of the paser-beam towards the object his scanners showed.

He peered anxiously at his vision-screen, knowing that if he was to survive he must sight and identify the other ship

first. If he was seen when his mirror-bright hull was finally exposed and he still had not positively located the other, then he would lose all his advantage.

The sixth remaining outer skin suddenly vaporised. Five left.

He glanced at his thermometer and found to his surprise that the cabin-temperature was now more than 110 degrees Fahrenheit. He saw that the cooling-system was turned up full, but still the needle of the dial crept round remorselessly.

His target materialised on his vision-screen and Farrell looked at it intently.

The definition on his screen was not fine enough to pick out each object individually, but what could only be a crowded mass of the old nuclear satellites clustered round each other in space. Farrell saw them on his screen as a haze of black specks and streaks.

But above and behind the cloud of satellites squatted the spaceship he had come to find.

He looked closely at its image in the screen.

What nation on Earth could have built this? He had seen nothing like it before. It was shaped like two long white cylinders bisecting each other at right angles. It was rotating slowly, not along the axis of either of the cylindrical hulls but in its own plane, like the spokes of a space-station without the circumference hull.

Farrell stared at it with a mounting sense of horror. *Could* this have been built on Earth? If so, then where? Certainly, he had never seen anything like it before.

Simultaneously, a dial before his eyes registered zero and the spaceship stopped rotating.

Farrell glanced at the dial—he had lost the last of his outer skins. Now his polished hull, shined to beat back as much of the sun's heat as it could, would itself be blazing like a minor sun.

But the other ship had stopped rotating.

Somehow, Farrell knew that he had been seen. The ship had stopped and it was because of him.

His tiny *Lawless* moved on slowly towards the other ship.

Immediately in front of him an explosion of light fogged out his vision-screen and a sharp blast-wave rocked his ship. His cabin-lights flicked out, then flicked on again. Farrell swore.

He jabbed at the controls and changed direction. At once, a second explosion shattered the approximate part of space he would have been in. In front of him he saw the cross-shaped ship rear up and away from the cloud of nuclear bombs and come directly towards him. Its movements were sudden and quick as it bore down towards him.

"Right, you bloody bastards," he swore under his breath. "If that's the way you want it."

He lined up *The Lawless* on a dead-ahead line, with the big ship fully in his screen. He kicked his foot against the firing-pedal and felt a jolt of adrenalin go through his body as the recoil from the torpedo-tube ran through the ship.

He changed direction as soon as he felt the two torpedoes go, then again and again. Explosions sheeted around his ship, frightening him with their accuracy. One was no more than a hundred feet from his ship, but its blast-effect was minor. That first one, Farrell thought, must have been *really* close. In space, there's nothing to carry a blast wave.

He watched the spaceship in his screen, counting off the seconds. Another explosion dead ahead scared him badly but did little damage.

And then the other ship exploded as the self-homing torpedoes hit home.

Farrell watched in fascination. The first spurt of flame came from near the centre, where the two hulls joined each other. A second later, spouts of white-hot flame exploded outwards, breaking the back of the ship. It folded in half, then part of it dropped away. Another explosion tore at it,

spinning the wreck away from him in a grotesque, staggering cartwheel of torn metal.

Farrell glanced at his thermometer. The temperature in the cabin was approaching 135 degrees Fahrenheit and his hands were shaking. Moisture ran down his face, and over his lips.

Five Earthside days later, Farrell eased *The Lawless* back into the bay of the satellite Beampower 18. In the hold of the ship lay between a hundred and fifty and two hundred of the nuclear devices, all that he had been able to get aboard. The rest still lay in a loose formation, orbiting the sun.

The actual job of collecting and stowing the bombs had been arduous and extremely tiring.

Because his batteries lasted for a maximum of thirty minutes, he had had to return continually to the paser-beam to recharge them. As a result, he'd made about twenty sorties to grab the bombs with the electromagnetic grapples, the whole time working in the impossible heat.

Finally, hardly caring whether or not the nuclear weapons were adequately shielded from the Beam, he had slumped back on to his couch and spent the major part of the return trip asleep.

As he slid *The Lawless* backwards into the launching bay, Farrell noticed that dozens of men in combat-suits stood in loose groups. Each one carried a hand-laser, and, at the neck of the bay, Farrell saw that two heavy-duty cannons had been discreetly mounted.

He suited up and climbed down out of the confined cabin, through the body of the ship and came out on to the bay platform. A soldier came up to him and Farrell realised suddenly that the uniforms they were wearing were not EASA ones, but of the Planetary Marines.

The man saluted him.

"Captain Farrell, sir. Major M'gawi. Mr. Jervis requested that you report to his office as soon as you return."

Farrell looked round.

"What's going on here, M'gawi?"

"Full alert, sir. Mr. Jervis is anxious to see you." He stepped backwards and Farrell moved past him.

Inside the recompression lock, he took off his space helmet. He had only once before seen Planetary Marines carrying arms and that had been during a crew-mutiny at a small station on the Moon. Even then, they had not had to use them. Everything seemed peaceable enough, he thought, looking round as he moved up through the levels towards Jervis's office.

He stopped at the hatch, banged his fist against it, and walked in.

Jervis was sitting at a large desk, looking tired and distraught. At one side a makeshift bunk had been made and it was covered untidily with crumpled sheets and blankets.

The man stood up as Farrell walked in.

"Thank God you're back," he said. "What happened?"

Farrell recounted what had happened with the other ship and described it to him.

"The bastards shot first," he said. "I had no opportunity to get near them."

"That's all right," Jervis said. "The ship was destroyed, though?"

"Yes."

"Describe it to me in as much detail as you can."

Farrell complied, drawing a rough sketch of the strange ship.

"I've never seen anything like it. It was rotating when I first saw it, but as soon as it sighted me it stopped."

Jervis said, "Did you get the bombs?"

"Not all of them. I couldn't fit them into the hold."

"Where are the rest of them?"

"I left them where they were. I figured no one would be coming back for them in a hurry."

Jervis sat back in his seat.

"Someone will, I'm afraid. If they haven't done so already."

"What?"

Jervis shrugged. "Did you see the Marines down there?"

"I was going to ask you about that."

"I'll bet you were." Jervis opened a drawer in his desk, and pulled out a tiny tape-cassette machine. "Listen to this."

He pressed a button and a high-pitched grating noise came out, reminding Farrell of the sound created by two sharp metallic edges rubbing against each other.

"That, believe it or not, is English. The distortion isn't electronic, although you would be excused for thinking that. In fact, we gather that that is the way they talk."

"They?"

The other man shrugged again.

"They," he repeated. "We don't know, either. About two days ago every radio and television channel on Earth was jammed with this noise. It went on for twelve hours, until some boffin down there managed to get it transcribed into something recognisable. By that time, Melbourne had already been destroyed."

Farrell sat forward sharply. "Melbourne? Destroyed?"

"I'm afraid so."

Jervis leaned across the desk and picked up Farrell's sketch of the spaceship. He tossed it back to him.

"That's not the only one of its kind. There are another thirty of them orbiting Earth at the moment. They're hostile."

He stopped the noise coming out of the cassette machine.

"Translated, that recording says something like this: That we people of Earth agree to provide the peoples of somewhere unpronounceable with a certain quantity of fissionable material every year. That quantity, incidentally, is impossible to attain—somewhere in the region of ten thousand tons a year so far as we can gather. Until such time as we agree to it, reprisals will be effected upon our

cities. Melbourne was H-bombed yesterday. We gather that another city will be destroyed some time tomorrow."

Farrell sat in silence for nearly two minutes.

"Why doesn't the Council attempt to negotiate?" he asked finally.

"They did. For two hours there was no reply, then the message started up again."

"I see. There's no doubt, then, that they mean business?"

Jervis shook his head slowly. "None whatsoever."

"Then why don't we——?"

"Send someone up to shoot them down? We have."

"And——?"

"And nothing. Apparently our friends were ready for them. Meanwhile, they continue to broadcast their terms."

Again Farrell sat silently.

"You said they came from somewhere unpronounceable. Where's that?"

Jervis looked at a piece of paper before him.

"The nearest we can get to it is something like: 'Yehkhathech'. But that's an approximation. You should hear the way *they* say it."

"That's what they call it. What do we call it?"

Jervis looked at him. "We don't know for certain," he said. "But there are rumours . . ."

"You mean Venus?"

"There's nowhere else. Everything points to it, however impossible it is to imagine."

Farrell nodded dumbly.

"One thing is absolutely certain. They're not from Earth. Every member-nation has solemnly sworn ignorance of these ships. Even the breakaway Asian countries have reaffirmed their solidarity with the Alliance."

"Where are the ships now?"

Again Jervis looked at some paper on his desk.

"They're in a tight bunch, orbiting the Earth at about seven thousand miles. It's not a fixed orbit, as they vary it

directionally every few minutes. But we've got a fix on them and changes are immediately recorded. The Council's got an electronic map of their orbital path."

"And there aren't any more of them?"

"No . . . At least, not at the moment."

Farrell was thinking quickly.

"How many raids have we sent up against them?"

"After the first one we sent up two more, but both of those broke off almost as soon as they were in sight. There's a lot of defensive hardware around."

"What's the orbital height of this Beampower satellite?"

"Nineteen thousand miles."

"So we're a considerable height above them. Do you think they know we're here?"

"Undoubtedly."

"But they're leaving us alone."

Jervis nodded. "And all the other satellites so far."

"Good."

He scribled hastily on a piece of paper on Jervis's desk.

"Will you give me a chance to have a go at them?" he said without looking up.

"No," Jervis said coldly.

"Why the hell not?"

"We don't want to lose you."

As Jervis had once done to him, Farrell held up his hand and spread out his fingers. He thrust them under the other man's face.

"One: I've got a ship out there fully armed. Two: I'll be coming at them from a direction they won't be expecting—above. Three: I've fought these bastards before and not only survived but beaten them. Four: you can afford to lose me. Five: if someone acts now we might save the lives of the people that live in whichever city it is to be bombed."

"It's still no."

"Why?"

"Because——because you'll be wasting your time and your life."

Farrell said, "You didn't mind that a week ago."

The other man stared at him for a second or two. "All right. But I'll have to warn the Council."

"No. If you do that the message might be monitored. I want to be able to surprise them."

Jervis jumped to his feet and came round the desk. He grabbed Farrell's hand and pumped it.

"I'll get my men on the beam to give you every assistance. But on one condition."

"Which is?"

"I get my H-bombs back before you go."

Farrell laughed. "You're welcome to them," he said.

FOUR

AN hour later, Jason Farrell was in space again, hovering in *The Lawless* about a mile from the Beampower satellite. He was strapped into the control-seat in an immoveable web of harnesses. Because of the varying orbital directions of the alien craft it was possible that the paser-beam would have to be moved while he was in flight. Although this was possible, unless all shipboard crew were firmly strapped down the resultant inertial sideways movements could kill them.

Farrell's plan was crude, but of necessity simple.

He was restricted to flying along the Beam and then only when it was pointing into the sun. So he and the directional crew on the Beampower satellite had to wait until the aliens' orbit brought them over the horizon of the Earth and up into the sunrise. For a few brief minutes they would be in the region of the paser-beam and during that time Farrell could attack.

Using the combined forces of the pulse engine, the gravitational field of the sun and the Earth, Farrell hoped to build up enough speed to make one fast passing attack and be away before he was seen.

Because of the radio-silence—no one had yet come up with an effective way of speaking by tele-communications to a ship inside the paser-beam—there was no way he could call on the satellite for help.

So he was on his own.

He looked at the chronometer, set to Greenwich normal time, on the control-console. 14.07 hours. It was estimated that the first signs of the alien ships coming over the horizon would be around 14.22.

Directly in front of him was the sun, touching on the Earth's horizon. Its energy was dissipated; the stunning heat of it where he had been a few days before was still a kind of mental enervation in Farrell's memory. He watched it dispassionately. Somewhere in that molten ball of nuclear reaction were the constituent molecules of his old ship.

14.12. He selected the forward polarity, and *The Lawless* began to move forward at an acceleration of one gravity. Slowly, but slowly, it built up speed.

In the vacuum torpedo tubes slung beneath the belly of the ship there were twelve torpedoes ready to be fired. He had only to pass within ten or twelve miles of the alien fleet, fire off the torpedoes and with any luck whatsoever he should be able to cut the number of ships by half.

At 14.21 the alien fleet appeared over the horizon of the Earth.

On his long-range screen they showed as a series of tiny blips. He slammed his control-lever forward and felt the surge of acceleration as his pulse motor developed its full power.

And down into the Earth . . .

Before him lay the curving lip of Earth, white and dazzling with the sun close beside it.

And into the sun.

On his screen the blips had now resolved themselves into thirty clearly-defined shapes. Huge crossed cylinders, spinning for some mysterious purpose known only to those who flew them and those who built them. Lazy, rolling like

the slow-moving propellors of an idling sea-ship, wedged tight in against one another in an impenetrable formation. A bizarrerie of alien machinery against a sudden sky and down below a wrecked Australian city with a million charred corpses. An intrusion of evil into a planet which, after more than two thousand years of war, had at last found a semblance of lasting peace and was growing to live with it. And, crippled by that very peace, the planet would die for the lack of preparedness.

The Lawless roared on down. Farrell watched his forward screen constantly.

With an abruptness that horrified him, the alien ships stopped rotating.

Had they seen him?

He kept his hands hard on the control-lever, knowing that nothing now, short of the collapse of the Beam, could stop him. He felt as if he hung in the webbing of his belts, falling from the heavens on to the fleet of alien craft.

In his screen, he lost the ships.

He took one hand from the control-lever, worked the finder mechanism so that the field of coverage was widened. The ships had moved, broken their orbit and were lifting away towards him.

He peered from time to time through the clear plaspex of the cabin port, trying to spot the ships by eye, but they were too far.

And he accelerated down.

He lost the ships again. They'd made a sudden jab to the right, as if in an evasive pattern. He widened the coverage yet again and the alien ships loomed into view once more.

In the satellite Jervis was evidently holding the Beam steady. There wasn't much movement he could play with, but it would be enough to give Farrell a manoeuvre pattern of his own. A prisoner of the paser-beam, his attack was directed by the line of invisible energy.

His speed was now prodigious: approaching twenty thousand miles an hour. He slackened his rate of accelera-

tion to one gravity. If he touched the Earth's atmosphere at this speed on his overshoot . . .

The alien ships moved again, this time away from the Earth and positively towards him. He marvelled at the sudden accelerations at which the ships must move. Did they somehow defy inertia? Surely, no human thing could exist inside a ship of that size and be subjected to such abrupt changes of direction?

Now they were climbing fast and Farrell realised the logic of their move. If they went much higher they would be between him and the sun, and thus invisible. From their point of view he would be a shining splinter of metal, reflecting the sun from the mirror-bright hull.

Once again, this insulating safeguard was endangering his life.

How far away were they? Farrell could see the alien ships as brilliant sparks, almost at the edge of the sun. One thousand? Two thousand miles away? What was their speed?

Then their path took them in front of the sun and abruptly they disappeared from Farrell's view. He shielded his eyes with his hands, and turned back to the scanner. There was too much light from the sun; however he adjusted the gain, he could no longer pick up the craft.

They were totally lost to his sight.

He plummeted on down, still gaining speed at the rate of thirty two feet per second, every second. But now his advantage was lost. Not only did he lack surprise, he lacked vision too.

Farrell had a sudden intruding mental image of a long piece of string held down with a heavy stone. Down the string fell a bead, irreversibly destined for the end however much the string may be twirled about. And he was that bead, joined to the sun by a string of pulsed energy—with the alien ships squatting across the string.

A pain-contorted face with white lips half-appeared before his eyes. The dying scream of Hawkins, as he pulled

the trigger in a cauldron of agony, rolled around the inner recesses of his ears. *Like Hawkins, I too will die before I reach the sun.*

Whichever way he struggled now, even if he were to leave the paser-beam and take evasive action to one side on his batteries, the alien craft would be able to pick him off. And even if they should miss, the accumulated power in his batteries would not hold out long enough for him to land safely on Earth. Instead, he would flutter down without control, into a soupy atmosphere at a mere twenty thousand miles an hour . . .

Incredibly, the sun brightened.

Brighter now than the white it had been. In quality of density, the sun became a greater fire, like a doubling of arc-lamps to an already-blinded eye. Then larger, too, the sun became the greater heat, expanding and widening its diameter in a rushing burst of energy like a multi-core explosion, each detonation adding fresh strength to an already overkill of blast.

Blast. . . .

Something Jervis had said. . . . *If you leave a fusion bomb in a paser-beam for more than a few seconds, it will detonate. That's why the hold must be shielded . . .*

Each of the alien ships must be carrying at least one of the bombs that had been stolen.

Now the fireball filled the whole of his vision, a white, glaring mound of nuclear release and deadly radiation. And he was hurtling towards it at over twenty thousand miles an hour. Even as he reversed the polarity of the pulse engine and his control-seat slammed round backwards to compensate for the decelerative gravity-force, Farrell knew that the paser-beam would take him irresistibly into the heart of the fireball.

And down, into the thermonuclear sun . . .

He watched the ball in his screen, which he could now only see by craning his neck against the reversed gravity-force and looking over his shoulder. Even as he watched

more detonations, seeming to come from the very heart of the ball, fed the artificial sun and strengthened the structure of it.

Without the decaying effects of atmosphere or planetary gravity, the nuclear fireball took on an existence of its own. It expanded and expanded, with no apparent limit to its size or intensity. Now black streaks of cloud appeared against its sides, now they were overtaken by the ever-expanding whiteness of the nuclear fury.

If nothing else, man had found a defensive weapon against the aliens should they return.

Radiant heat from the explosion surrounded the tiny craft and for the second time Farrell knew death by sun.

And down . . .

He became aware, through the mounting heat and dazzling light in which his cabin was immersed, of a variation in the thrust. It seemed to add to the decelerative gee-force, yet not from the blast of the nuclear bombs. Somehow, beneath him. Pushing him away. *Upwards.*

But there is no *up* in space, just as there is no blast, nor weight, nor oxygen. Define your terms, Jason Farrell, he told himself through a pain-ridden mist of heat. *Up* is the opposite of *down*, and the result of differentiation of direction when down is the predominance.

Lucid, for a dying man.

And *down* into the sun becomes *up* when there is a differentiation of that and if that differentiation is now, then the direction is away from the bomb and sideways to the open sky . . .

Lifted bodily on the paser-beam, wielded at its satellite source by men of science, up and away, through the outer fringe of the blackening fireball collapsing and imploding in upon itself no longer fed from within, the tiny spacecraft of Jason Farrell sped out from the Earth and the heat and tumbled without control into the dark, cool sanity of space.

And cocooned inside, across white lips now reddening, a man began to laugh and found he was no longer sweating.

R26/5/PSY AND I

by

MICHAEL G. CONEY

Agoraphobia will become increasingly prevalent in the big city complexes as leisure hours are extended. Perhaps technology will be able to cure its own bi-product.

R26/5/PSY AND I

AFTER a while I became aware of the man sitting at the desk opposite and this, I suppose, was a good sign. The very fact of this awareness signified an awakening of interest in my surroundings.

"When did you last leave your room?"

His lips were moving; they were thick lips, not sensuous but just a little bloated. Somehow prehensile in their careful enunciation, as though he tested each word thoroughly, rejecting any impurity before his speech reached its hearers. The lips were in keeping with the rest of his face which was large, rounded, and comfortably well-fed. Kindly. This was a man whose business it was to make friends and who was careful with his words.

"When did you last leave your room?" His eyes, twinkling behind folds of flesh, regarded me good-naturedly. I had nothing to worry about, they were saying.

And I believed them, because that was the line of least resistance. "Last month, I think," I replied.

"Time loses its meaning, doesn't it?" He nodded sympathetically.

The single object on his leather-topped desk was a file; my case-history, and he opened it, leafing through the pages. He was going bald; I noticed this as he bent his head to read and I wondered idly whether he worried about it.

"Do you worry about things?" he asked, inverting my thoughts in uncanny fashion. "The birthrate, overcrowding, Mars, food? While you are sitting in your room, do you begin to feel shut in? Do pressures build up against you?"

"No," I answered truthfully.

"Why don't you go out?" he asked.

The office was rectangular with yellow walls and a green

ceiling and behind the man was an open window, affording a rooftop view of the city extending to infinity. I had had an attack of the horrors when they had taken me from my room and brought me here. There were so many people . . .

"Why don't you go out?" he asked.

"Because I don't want to, I suppose." I didn't think this would satisfy him, but he made a note in my file with a green ball-point.

"You were found in your room by my men following a call from Central," he informed me, as if I didn't already know. "A spot-check on Central's switchboard revealed that your door hadn't been opened for two months. They found you sitting in a chair next to the food chute with the 3-V switched off. They diagnosed chronic apathy; correctly, I think, and they brought you here."

This annoyed me a little, because it seemed to me an infringement of the liberty of the individual. "Bloody snoopers," I muttered, low so that he wouldn't hear. I liked *him*, it was Central I couldn't stand. They kept their finger on everyone.

"It's a big city," he went on. His name was Ford; he had a little plastic label on his jacket saying as much. "It's easy to get lonely in a big city. People don't seem to care . . . How old are you, Johnson? Thirty? Thirty-one? You're young enough to make friends."

I laughed, bitterly. I had had my fill of friends. They sponged on you, drank your drinks, invaded your privacy and drove you mad with incessant, nattering monologues on matters of supreme unimportance. "I'm quite content with my own company," I stated coldly.

He looked at me oddly, one eyebrow raised. "How strange that you should say that."

"Strange?"

"I've heard it so often before," he said, "from men sitting just where you're sitting. They have told me, apparently in all sincerity, that they were quite happy by themselves. At one time I used to believe them. I'd let them be; leave them

alone and in due course they would commit suicide. Now I know better ... The mental health of this city is my job, Johnson, and I'd be failing in it if I didn't try to help people like you. Apathy is a cruel affliction."

"You're lucky to have a job," I mumbled, wanting to get home.

"We can't all have jobs, but at least we can make a worthwhile contribution to the social complex." He pressed a button. "I know it's no use my telling you to pull yourself together and then sending you home. You need treatment."

"Treatment?" I echoed nervously. I've heard rumours of Restraint Centres for would-be suicides, where everyone is herded together and forced to compete; to outdo one another until the Authorities, in their wisdom, decide that they have regained their interest in life and send them home ... I couldn't stand that.

"No, not a Restraint Centre," he chuckled, reading my thoughts again. "A Restraint Centre is only a last resort and if I commit a person there, then I've failed. No. There have been recent developments in the field, a little more humane than Restraint Centres and I propose to use you as a—ha—guinea pig in a series of tests I am performing. One-hundred per cent success so far, I'm pleased to say ... I'm going to give you a companion for a while," he said surprisingly. "Someone to cheer you up. Snap you out of it. Much better than a Restraint Centre. Mind you, success in the treatment depends largely on you. If you don't co-operate, then I'm afraid ..." He grinned at me waggishly, as though I were insane.

The door opened and an attractive nurse wobbled in. For a moment I wondered whether she was to be my companion, but it was too much to hope for.

"This is Nurse Williams," Ford introduced us. "I want you to go with her and have a personality test. Don't worry; it's just a question of finding the ideal companion for you."

Within minutes my scalp was a Medusa-like tangle of electrodes. Nurse Williams was thorough.

I was lying in my chair again, thinking gratefully about absolutely nothing. It was good to be home, with the 3-V alcove comfortingly blank and the whole room heavy with deep silence.

But then there was a knock at the door. Too soon, surely? I glanced at my watch and discovered with mild surprise that I had been sitting motionless for almost five hours. It was time for dinner. I thumbed the delivery button and a clattering sounded from behind the hatch cover. A whiff of something savoury arose.

Someone was knocking. Sighing, I left the eatomatic to its deliberations and struggled wearily from my chair. I opened the door to find a tall figure standing in the corridor; dark suited and with a face of remarkable anonymity. Everyone looks anonymous these days, but this face particularly so, as though his Creator had accurately fulfilled an order for an Average Man.

"I am R26/5/PSY," he informed me explicitly. "I am your companion, and I trust that we shall get on well together. Perhaps you will call me Bob, Mr. Johnson."

I didn't volunteer my Christian name; I wasn't having any bloody robot getting familiar with me. "Come in," I said, shortly and unpleasantly.

He obeyed and something in his attitude needled me, immediately. He couldn't help the way he walked, I suppose; that was how he was made. He strode masterfully into the room and paused, looking around as if he owned the place. He wore a pained expression on his face too, as though he could smell something rancid. He turned around, taking it all in without saying a word.

And then he walked across the room and sat down in my chair.

I should have corrected him at once, I realised that, afterwards. After all, he was only a machine, but I do feel

that one must maintain a veneer of politeness, even with one's inferiors. Nevertheless, I should have pointed out, in the gentlest fashion, that he was sitting in my personal chair. He would have moved quite willingly, I'm sure.

Instead I sat furiously in the other chair, hating him.

"I hope that we get along together, Mr. Johnson," he repeated politely, absently opening the food hatch and taking out a plate of meat pie. He began to eat. I didn't know that robots *did* eat.

"This is your regular job, is it?" I asked, watching him forking down my food. "I mean, going about and cheering people up? I suppose they reprogramme you each time according to the tastes of your next customer?" I wanted to get that one in, to remind him that his very existence was courtesy of Man.

"That's right," he mumbled in disgusting fashion through a crammed mouth. "I am programmed to treat the prospective suicide in the most effective manner according to the mentality, or lack of mentality, of the individual."

He fell silent while I fumed inwardly at the tactless phrasing of his reply. For a long time I couldn't trust myself to speak and he didn't seem to want to.

Then unexpectedly, he turned to me. "I like sitting quietly, like this," he said, smiling blandly. "Companionable, isn't it? I think we're going to get on well." There was another long silence.

This was not at all what I had understood to be his purpose. I had expected him to be the life and soul, cracking jokes, jollying me along and slapping me on the back—and I had been dreading it. Now, however, I was finding this unnatural silence even worse. I wasn't getting my money's worth, so to speak. I had expected action, but this robot appeared to be suffering from an apathy more chronic than my own.

Then, as I watched him, he flipped open a flap beneath his jacket and extracted a clear plastic bag containing the pulverised remains of his meal. Reaching over, he dropped

it down the disposal chute which protruded from the wall. He sighed, shrugged himself more closely into his chair and lazily opened another flap concealed under his breast pocket. I watched, astonished, as he turned a knob to a position marked "MINIMUM POWER", re-closed the flap and relaxed, eyelids drooping.

He had switched himself off! Of all the infernal nerve. I hitched my chair closer and dug his unyielding ribs. "Hey!" I shouted, close into his ear.

There was a lengthy hiatus as his hand, in irritating slow-motion, left the arm of the chair and drifted across his body, fumbled open the flap and turned the knob to "MAXIMUM POWER".

His eyes snapped open and he sat up, alert. "Yes?" he replied, briskly.

I had forgotten what I had intended to say. He was eyeing me keenly, his expression akin to that of Ford, the psychoanalyst. Watchful but friendly. "I didn't realise robots ate," I said at last, weakly.

"There's no need for it, of course," he replied. "It becomes a social habit. Not only that, but I am equipped to appreciate the flavour of food. That pie was delicious."

"I'm glad you enjoyed it," I said icily. "I had intended it for myself."

"Oh," he exclaimed, "I'm terribly sorry . . . I'm not very well-versed in etiquette, I'm afraid." He pressed the button on the eatomatic and presently withdrew a plate of sandwiches which he handed to me. I was about to thank him sarcastically when I detected a gleam in his eye, but was too late to prevent him from snatching a sandwich and popping it into his mouth.

"There is, of course, no limit to my appetite," he remarked frighteningly. The permitted food intake per person per day has been reduced recently, due to the rise in the cost of the other social services. Someone has to pay for items like R26/5/PSY and that someone is, as ever, the consumer.

"Look," I said, trying to make my voice sound reasonable. "While you're here, would you mind not eating? I don't mind you plugging yourself in for a recharge during off-peak hours, but food is scarce. You realise that between us we've eaten my quota for the rest of the day?"

Did he show any sign of remorse? Not on your life. He even had the gall to suggest that I could have had the contents of his plastic bag, if I felt like that about it. It was quite sterile, he assured me.

We didn't speak for the rest of that afternoon and evening. I went to bed feeling more depressed than ever and I passed a disturbed night. Each time I woke up, which was frequently, I could hear the hum of him recharging, like a droning snore.

I had been awake for ten minutes before I remembered R/26/5/PSY and those ten minutes were to be the pleasantest I experienced during the course of the next two weeks. I lay in bed gazing at the cracks in the ceiling which, together with the oddly-shaped indentations where the plaster had fallen away, gave the impression of scaly creatures moving through a primeval forest. I always allow myself the luxury of an hour or so's imaginative daydreaming in the morning; it is quite possibly the only real thinking I ever do . . .

It doesn't last, though. Sooner or later the Greys, as the apathetic condition is popularly called, return and my mind gradually becomes dulled. Before this happens I have to make the effort of getting up, going to the toilet, and dressing, otherwise I might well lie in bed all day.

It's the purposelessness that disheartens me. Getting up is only self-discipline, I might just as well stay in bed. There is nothing to do and if I should ever go out, all I can see is the massive accommodation blocks and the milling people, equally purposeless.

As I began my first fantasy which was based on a roughly triangular group of cracks in the ceiling, I suddenly

remembered the robot, who was presumably still sitting in my chair. I tried to concentrate on the cracks, but it was no good. I kept thinking about that robot and wondering what *he* was thinking about.

Or was he not thinking at all, just lying there switched off, depreciating as he became obsolescent and so frittering away public funds? A spark of irritation stirred me. He ought at least to bring me breakfast in bed.

"What are you doing?" I called through the screen which divides my bed from the rest of the room.

"Looking at the cracks in the ceiling," he replied.

I felt my face flush with fury. He had pulled that one on me last night. I had been sitting in the spare chair and he had been sitting in my chair and I had suddenly become aware that he was drumming his fingertips on the upholstery. I was about to remonstrate with him when I discovered that my own fingertips were tapping and realised that, in fact, they had been doing it for some time. The bastard was mimicking me.

"Why the hell are you looking at the cracks?" I shouted.

"It's interesting," he replied. "I find it exercises my brain circuits. And frankly, there's not much else to do. Why don't you get up?"

I calmed down. He couldn't have known what I was doing; it was pure coincidence. I slid my feet from between the sheets and stood up. I stretched and, yawning, began to dress. "The start of another weary day," I remarked vaguely to myself.

"There's no reason for you to feel weary after a night's sleep," he said testily. "There must be something wrong with you."

"That's why you're here," I replied, fighting to control myself. "To get me right again." I always feel irritable immediately after rising. This is one of the reasons I live by myself; more than one girl has stormed out of my apartment during breakfast, never to return.

"Wrong," he said, maddeningly. "I'm here to prove that there's nothing wrong with you."

"For Christ's sake!" I stepped from behind the screen, dressed and furious. "First you say there's something wrong with me and then you say there isn't. Your logic circuits want fixing!"

"There's nothing wrong with my logic!" he grated, jumping up and clenching his fists. I hoped he still remembered the First Law. "You're a malingerer, sponging off public funds. You don't need me. You need a good punch on the nose!"

I was across the room in two strides. "Want to make something of it?" I yelled, forgetting myself and Asimov too.

He sat down abruptly. "Sorry," he muttered, after a pause. "I don't know what got into me. It takes me a while to get functioning properly after a recharge."

I was standing over him, still with bunched fists, taken aback by this sudden *volte face*. He was staring at the wall, trembling now and then and the room was very quiet. I felt foolish. I wasn't quite sure what had got into me, either. It was just that R/26/5/PSY and I didn't seem, somehow, to hit it off together. The very sight of him sitting there caused my hackles to rise.

And in the week that followed things went from bad to worse. I did however succeed in getting my chair back by the simple expedient of asking for it. After all, he *had* to obey direct commands. But he gave way with extreme bad grace and salved his pride by pacing the room in aggravating fashion before eventually switching on the 3-V.

I don't enjoy the 3-V; it's too realistic. It's like having real people in the room, as though the robot himself wasn't a serious enough invasion of my privacy. Now, with him sitting beside me and a series of soap-opera morons performing real-life drama in the corner, things were intolerable. Over and again I would ask him to switch it off and he

would, of course, obey. But it wouldn't be long before he switched it on again, furtively.

Oddly, towards the end of the first week he suddenly tired of the 3-V, just as I was getting interested against my better judgment and our situations became reversed. He kept switching it off, while I began to welcome the images as being a change from his peering, vacant face.

It was at about this time that I realised what was happening. The countless little irritations were beginning to add up, but it was the business of the 3-V which finally clinched it.

He hadn't been provided merely to keep me company. The Psy department had never intended to give me a friend and companion. That was not their idea at all.

This robot was an adversary. He had been sent to drive me crazy; so that I would eventually decide that anything, anything was preferable to sitting in the apartment with him. It all fitted; everything he had done since his arrival had been carefully calculated, by reference to my own brain patterns, to irritate me beyond endurance. Everything added up.

They had been succeeding, too; but now I had rumbled them I thought I knew the answer. In a way, the situation was not far removed from that of a Restraint Centre; so I would go along with them on that basis. From now on I would get about, pretend to enjoy myself and see the sights. I would start by taking a drive out into the country, tomorrow. Tedious, but necessary for the impression I wished to give.

Then, after a few days of this, R/26/5/PSY would be convinced that he had done his job and, flushed with success, would report to the Psy department that I was out of danger.

And they would take him back and leave me in peace.

Does anything ever work out according to the plans of a mere individual like myself?

In this vast city, where every moment of every person is

monitored in order that an equilibrium may be kept and the various public services remain efficient, very little is left to chance. A mass exodus from the Sports Stadium? The transport is there to take us home. An accommodation block on fire? Traffic is diverted and the fire brigade arrives within minutes. A mass epidemic? Doctors are found, hospital capacity is doubled, trebled instantly. Nothing goes wrong, ever.

So the fates, frustrated, vent their spite on helpless individuals like me.

It was a fine day and I was almost looking forward to a long drive into the country; a round trip of about one hundred miles. it would take all day and, I thought, that would be one day less in the company of R/26/5/PSY. I pictured him sitting there in the flat, switched off and sluggish, while I drove among the hills and trees, alone.

"Ready, then?" He was standing behind me. He had crept up on me while I was gazing out of the window.

"What?"

"The drive in the country," he said with an appearance of heartiness. "The drive you said we were taking today."

"I had intended to go alone," I replied with dignity, putting on my coat.

"I cannot permit that. I regret that I must accompany you. You realise that, in your present mental condition, you cannot be allowed out alone."

"But I'm much better," I protested. "Otherwise I wouldn't want to go out."

"It is possible that you intend to commit suicide," he replied cleverly. "It is my duty to frustrate you."

I gave up. There was nothing I could do. If I persisted in my intention to go out alone and endeavoured to lock him in the flat, he would overpower me. I didn't relish the thought of being overpowered by R/26/5/PSY, who had scored enough verbal victories already without being allowed the additional triumph of rendering me helpless with a half-nelson.

"OK," I muttered. "Call me a car."

We seated ourselves in the vehicle and I switched on, feeling his eyes upon me. With a sudden impulse of rebellion I flipped the control switch to Manual and pulled away from the kerb rapidly, slipping through the gears in fine style, considering it was at least three years since I had last driven one of these enthusiast's pieces.

We had travelled some four blocks before I realised that the robot had obtained a dual control model and it was him driving, not me. He was anticipating every move I made by a fraction of a second and the car was responding to his swifter reactions. All I was left with was the steering wheel and the moment I made a false move he would stamp on the brake.

Half a mile farther on I had found the overriding button which cut out his controls. I thumbed it.

"You realise that the car is required to be on Underroad Control while within the City limits," he grated, jabbing at the useless brake.

"Yes," I replied, with satisfaction.

"Stop the car, Johnson!" he snapped. He had dropped any pretence at politeness days ago and with it the title Mister.

"No."

"I shall be forced to overpower you." He sidled towards me, reaching for the wheel. "For your own good."

"Try it," I replied recklessly. I was past caring.

There was an intersection ahead. As he forced my hands from the wheel I thrust at the accellerator.

With an almighty grinding of tearing metalwork the car slammed to an abrupt halt. I quickly realised that it would remain there until the breakdown crew arrived, as another car was slewed across our bows and we appeared to be interlocked in the most complex fashion.

So much for my original idea of a nice, quiet, solitary drive in the country.

Her face was twisted with annoyance and she was tapping at the window, mouthing at me. Reluctantly, I wound the handle.

"I said, what the hell do you think you're doing?" she shouted above the sudden din of street noise which flooded the interior.

"I regret that my friend went temporarily berserk," bleated R/26/5/PSY.

She switched her attention from me and focused on the abashed robot.

"You mean you sat and watched this man drive a car on Manual, within the City limits?" she accused. "What is your number, robot?"

"R/26/5/PSY," I replied for him, quickly. "But the robot is not entirely to blame, although he may appear nervous at the moment and is speaking thoughtlessly. I knew exactly what I was doing and certainly did not go berserk. I was goaded beyond endurance, I'm afraid, and eventually rebelled against the domination of this machine. Unfortunately you happened to be in the way. I'm very sorry," I concluded, with a winning smile.

The guiding principle of life, these days. When caught out, shift the blame to a robot; his shoulders are broader than yours.

She regarded me with sudden interest, almost friendliness. "I think I know how you felt," she said. "But it doesn't alter the fact that my car's a wreck." A uniformed figure appeared at her elbow. The Law had arrived. I opened the door and stepped out, leaving the stricken robot staring dumbly at the dashboard.

"I'm sorry about this little upset, Officer," I said quickly. "Let's just accept it as one of those events which prove that machines are not always, thank God, infallible. Almost reassuring to know that they, like us, can err on occasions, don't you think?"

The slab-faced policeman was unimpressed. "That's as

may be," he observed, laboriously extracting a notebook and sucking his ball-point noisily. "Name?"

"Johnson, Hugo. 18659244."

"Just a moment, Officer." The girl was speaking again, and her smile had visibly more effect upon the policeman than mine. "Do we have to get all official about this? I don't wish to press any charges against this man. I mean, can't we forget about it?" She had short blonde hair and suddenly I realised that she was quite attractive.

The breakdown crew arrived some fifteen minutes later and we left them to their labours. We walked back to my apartment for a drink, Joan and I together—we had, by this time, introduced ourselves—and R/26/5/PSY trailing disconsolately in the rear.

Although I had reason to congratulate myself for the efficient way I had turned our chance meeting to advantage, I could foresee difficulties if Joan discovered the true purpose of R/26/5/PSY. She seemed the sort of girl who was, well, ready to make friends, but even she would draw the line at consorting with a nut. Walking along beside her and chatting pleasantly, I was beginning to realise what I had been missing over the past months. She had a tolerable face and figure and I was already laying my plans for the day's skilful seduction; it would be a pity to have it all spoiled by a tactless remark from the robot.

"What exactly is that robot, Hugo?" Joan asked. "I mean, why is he with you?"

"I'm looking after him for a friend," I said loudly for the benefit of R/26/5/PSY, half turning and staring at him meaningly. He tagged along without change of expression, regarding me inscrutably.

"Is he useful about the house?"

"Look ... Let's not talk about the robot. Let's talk about you. Tell me about yourself. Where do you live? What do you do? What are you interested in?" I fired questions at her, taking her arm and guiding her in at the accommodation block entrance. We climbed the stairs and I stood aside

to allow her to enter my apartment, thinking how long it was since last a girl had been in my room.

Unfortunately I stood thinking for too long and R/26/5/PSY, following up fast, brushed past me and showed Joan to a chair with old-world courtesy. My chair, of course. She thanked him, glancing at him with surprise and what looked like respect, and sat down. She showed a considerable amount of thigh, which caused R/26/5/PSY to leer unpleasantly.

For a while I seemed to be out of it, as they chatted together like old friends, the robot's circuits doing handsprings in an effort to appear agreeable. He was succeeding, too, so completely that when finally I ventured a remark, well out of context admittedly, Joan merely glanced at me blankly before turning back to the robot to continue an animated conversation on the subject of the problems of the working girl.

"Fix us some drinks," I commanded him, abruptly.

He busied himself at the dispenser and Joan watched him while I watched her. It seemed to my inexperienced eye that she wore too much make-up, in the artificial light this gave her face a mottled, flakey-powdery appearance, like the ceiling.

"Er, what do you think of my room," I asked frantically, trying to get something going before the robot returned with the drinks. But R/26/5/PSY was taking his time, clattering away in the corner and getting nowhere.

"Not bad," she replied. "Some of the stuff is a bit worn, perhaps."

I experienced a flash of annoyance. Now that my feeling of gratitude towards her over the car episode had abated, I was beginning to see her in a more critical light, and what I saw I didn't much like. Her presence seemed to crowd the room; she looked harsh and brassy and I was finding her conversation boring. All the same, any girl is better than no girl, so it was as well to go through the motions.

"Your drink, Madam." The robot bent low over her,

handing her a glass and allowing his other hand to rest lightly on her shoulder.

What the hell was he thinking of, grinning into her eyes in that idiotic way? And why was she smiling back instead of dismissing him? Surely she knew that robots were emotionless machines, even if R/26/5/PSY didn't? What was going on?

"Cut that out, R/26/5/PSY!" I snarled. "And what about my drink? Blown a fuse in your memory banks?"

"Sorry, Johnson," he grated. "I was merely admiring the lines of Miss Pilling's body, which accord very precisely with what I am programmed to recognise as the ideal female form."

"Thank you, Bob." Joan tried to blush.

This was the juncture where something snapped; when the pent-up irritations of the past weeks exploded in my brain like an over-generous mass of U-238, triggered by the sight of that stupid girl making sheep's eyes at a robot. Not just any robot, but a machine which had successfully been pitting its wits against mine for days. Now, in that ultimate test of man against machine—sex—the bastard was beating me again.

"By God!" I shouted, "I won't have that talk from a robot in my apartment. Do you realise"—I addressed Joan forcefully—"that this is just a bloody machine? A load of cogs and circuits with no aesthetic appreciation whatever? It's laughable," I laughed hollowly to illustrate the point, "ha, that he should pretend to make a pass at you. Can't you get it into your thick head that he just regards you as an organic lump of motivated meat and none too clean at that?"

"Not clean?" Joan was on her feet.

"As compared with him, I meant. He's sterile, in more ways than one!" I was on my feet, too.

A hand fell upon my shoulder, plastic-skinned steel fingers biting into my flesh. "I regret that I am obliged to overpower you," came a harsh voice from behind. "And I

must inform Miss Pilling that you are in my medical care. You are becoming dangerously excited, and may do her harm unless restrained."

He then proceeded, efficiently, to overpower me.

"It's good to see you looking well, Mr. Johnson. I'm very pleased indeed that the treatment was so successful." I was facing Ford at his desk a few days later, conscious of surprise at the quick passage of time. Everything looked the same and I had the irrational idea that he hadn't moved since my previous visit; that he and the room had been sealed off, awaiting my return.

"Yes," I replied slowly.

But he was right, of course. I was cured. I had taken the necessary steps towards getting out and meeting people. I had even, for a short time, had a girl in my room; and now I was to be relieved of the company of R/26/5/PSY. I was looking forward to getting more girls in my room, the more the better and I felt that I would genuinely enjoy, next time, that intended drive to the country.

I might even take with me that old man from the next apartment; he would enjoy a day out. Strange that I had never met him before last week, when we had been neighbours for years. Over the past days we had enjoyed many interesting conversations following my first timid visit made with the object of avoiding R/26/5/PSY for an evening.

"How did you get on with your robot?" asked Ford, eyes twinkling from within the fatty tissue.

I was about to make some evasive reply, then realised that I couldn't fool this man. "Badly," I said.

"Good," said Ford. "I suppose you guessed that was the general idea?"

"It didn't take long."

"Tell me," Ford took out his pen and opened the file, "exactly how R/26/5/PSY set about his job. I should like to know, for future reference . . . I think, for example, that

he might have been a little unsubtle. Your recovery might have been accellerated if you hadn't realised *how* you were being driven out of your room; I think possibly his obvious antipathy made you more stubborn."

"Possibly," I said, beginning to smile, now. The whole thing seemed somewhat ridiculous, in retrospect . . . "Well, he started off by sitting in my chair."

"That follows," said Ford with satisfaction. "A nice touch, I think."

"Then he seemed somehow to become, well . . . *awkward*. You know, mulish. If I gave him a command he would obey, of course, but grudgingly. And he had a knack of getting his own back."

"You're a pretty stubborn character yourself, Mr. Johnson." Ford made a note. "The robot was programmed to—er—react to you personally, you know."

"Then he would mimic me," I went on, "and finally he began to get quite domineering . . . Oh, and to cap it all," I felt myself flush, "he made a pass at a girl I took home!"

Ford suddenly lay back in his chair, looked at me with piggy eyes twinkling and burst into fat chuckles. He shook mirthfully, dragging a handkerchief from his pocket and wiping his eyes. I waited for him to stop, feeling annoyed. I didn't think it was all that funny.

I said so, harshly. "At the time, it was bloody embarrassing. He overpowered me in front of her. Anyway, how can you programme a robot to make a pass at a girl? It's meaningless. What sort of bloody-minded characteristics did you manage to feed into that thing?"

And as I said those words, I knew.

Ford went on, of course; delighted with his little psychological joke. I couldn't have stopped him if I'd tried.

"Of course the robot made a pass at your girl," he chuckled. "Naturally he infuriated you in other matters like mimicking you and sitting in your favourite chair; it was the way he was programmed.

"When Nurse Williams gave you your personality test

she merely connected R/26/5/PSY to the output lead of the encephalobox and fed your brain patterns directly into him. Do you remember telling me, a few weeks ago, that you liked your own company? The robot possessed an almost perfect replica of your own brain! You wouldn't know, but this was the one personality guaranteed to needle you out of your apathy by its sheer bloody-mindedness. Your own!"

I got up to go. There didn't seem to be much to say.

Ford had the last word, of course. "How did you like it, Mr. Johnson?" he called as I closed the door. "For the past three weeks you've been living with yourself!"

MEATBALL

by

JAMES WHITE

Continuing the saga of Drs. Conway, Prilicla, and others of "Sector General Hospital" in space and the living planet of Drambo—better known as "Meatball". (For intermediate information see New Writings in S.F. Nos. *7, 12, and 14.)*

MEATBALL

ONE

CONWAY had been worrying about the Meatball problem during the whole of the trip back to the hospital, but only in the past two hours had the process become a constructive one. That had been the period during which he had finally admitted to himself that he could not solve the problem and had begun thinking of the names and professional capabilities of some of the beings, human and otherwise, who might help him find the solution. He was worrying so hard and constructively that he did not know that their ship had materialised the regulation twenty miles from the hospital until the flat, translated voice of Reception rattled from the control-room's speaker.

"Identify yourself, please. Patient, visitor, or staff, and species?"

The Corps lieutenant who was piloting looked back at Conway and Edwards, the mother ship's medical officer and raised an eyebrow.

Edwards cleared his throat nervously and said, "This is scoutship D1-835, tender and communications ship to the Monitor Corps survey and cultural contact vessel *Descartes*. We have four visitors and one staff member on board. Three are human and two are native Drambons of different——"

"Give physiological classifications, please, or make full-vision contact. All intelligent races refer to themselves as human and consider others to be non-human, so what you call yourself is irrelevent so far as preparing or directing you to suitable accommodation is concerned."

Edwards muted the speaker and said helplessly to Con-

way, "I know what *we* are, but how the blazes do I describe Surreshun and the other character to this medical bureaucrat?"

Conway laughed and took the mike without thumbing the transmit switch. He said, "In certain circumstances—if we had a very sick e-t aboard in need of urgent treatment and with exotic food, gravity, temperature, and atmosphere requirements—a medical bureaucrat in Reception could be a very good thing."

In the forward vision screen the lights of Sector Twelve General Hospital blazed against the misty backdrop of the stars. From its thousands of viewports shone light that was yellow or red-orange or a soft, liquid green. But there were patches of darkness as well, and behind these areas of solid plating lay wards and corridors wherein the lighting was so viciously incandescent that the eyes of approaching ships' pilots had to be protected from it, or sections which were so dark and cold that not even the feeble glow which filtered in from local traffic could be allowed to penetrate to their patients.

In addition to the patients, whose numbers and physiological classifications varied from day to day, it housed a medical and maintenance staff made up from members of the sixty-odd—sometimes very odd—intelligent species known to the Galactic Federation. Together they prided themselves that no case was too big, too small, or too hopeless for them, and their professional reputation and facilities were second to none.

Now Conway was about to hand them a case which seemed hopeless from the start and was at the same time the biggest medical and surgical problem they had ever been asked to tackle.

Thumbing the transit switch he said, "This ship contains three Earth-humans of physiological classification DBDG. They are Major Edwards and Lieutenant Harrison of the Monitor Corps and myself, Senior Physician Conway. We are carrying two Drambon natives. Drambo is the native

name for the planet—you may still have it listed as Meatball, which was our name for it before we knew it had intelligent life. One of the natives is a CLHG, water-breathing with a warm-blooded oxygen-based metabolism. The other is tentatively classified as SRJH and seems comfortable in either air or water.

"There is no urgency about the transfer," Conway went on, "at the same time the CLHG occupies a physically irksome life-support mechanism and would doubtless feel more comfortable in one of our water-filled levels where it can roll normally. Can you take us at lock Twenty-three or Twenty-four?"

"Lock Twenty-three, Doctor. Do the visitors require special transport or protective devices for the transfer?"

"Negative."

"Very well. Please inform Dietetics regarding food and liquid requirements and the periodicity of their meals. Your arrival has been notified and Colonel Skempton would like to see Major Edwards and Lieutenant Harrison as soon as possible. Major O'Mara would like to see Doctor Conway sooner than that."

"Thank you."

Conway's words were received by the being who was manning the reception board, whose translator pack relayed them to the computer which occupied three whole levels at the nerve-centre of the hospital, which in turn returned them stripped of all emotional overtones to the scaley, furry, or feathery receptionist in the form of hoots, cheeps, growls, or whatever other odd noises the being used as its spoken language.

The emotional overtones did not escape Major Edwards, however, who said, "This O'Mara sounds like a captain I had once—it didn't matter what you said to him so long as it was yes sir. But don't worry, Doctor. I'm a Major, too, and I'll protect you . . ."

"Hah," said Conway with even more emotional overtones.

"I worked hard for this braid on my sleeve, Doctor," said Edwards, sounding hurt. "Normally we don't worry too much about rank in the Corps, but no Major is going to tell me what to do or disregard anything I say about you or your work on Meatball—oops, I mean Drambo. What is this O'Mara character like?"

Conway laughed. "I'm grateful for your offer of protection, but O'Mara doesn't pull rank either, or even believe in it, and it is very hard to describe him in printable language, but I'll try . . ."

Sector General was administered and maintained by the Monitor Corps, the Federation's executive and law enforcement arm and, while there were scores of officers in the hospital who outranked him, the limits of Major O'Mara's authority were difficult to define.

As the hospital's chief psychologist O'Mara's prime responsibility was the efficient and smooth integration of its medical staff. But keeping so many different and potentially antagonistic life-forms working in harmony was no easy job. He was constantly on guard to detect and neutralise potentially dangerous inter-personal situations before they could become serious, or in extreme cases to remove the individuals responsible. To this end he was given a large and in many cases the final say in which doctor was assigned where and to whom. It went without saying that he suggested, continually and not at all respectfully, how best the Corps officers responsible for technical support and maintenance at the hospital might best deploy their various abilities . . .

"What you should remember when you meet him," Conway went on seriously, "is that he is polite to strangers and patients, and when he begins to like you he relaxes and becomes his natural, bad-tempered, obnoxious self——"

"Sorry, Doctor," said the pilot. "We'll be docking in five minutes and you did say that you wanted to prepare the visitors for transfer."

Conway nodded and Edwards said, "I'll lend a hand, Doctor."

The scoutship entered the enormous cubic cavern which was Lock Twenty-three while they were donning the lightweight suits used for environments where the liquid or gas was lethal but at reasonably normal pressures. They felt the grapples draw them into the adjustable cradle and staggered slightly as the artificial gravity grids were switched on. The Lock's outer seal clanged shut and there was the sound of waterfalls pouring down metal cliffs.

Conway had just finished securing his helmet when its receiver said, *"Harrison here, Doctor. The reception team leader says that it will take some time to completely fill the lock with water as well as making it necessary to carry out the full anti-contamination procedure at the other five internal entrances. It is a big lock, pressure of water on the other seals will be severe if——"*

"Filling won't be necessary," said Conway. "The Drambon CLCH will be all right so long as the water reaches the top edge of the freight hatch."

"The man says bless you."

They let themselves into the scoutship's hold, carefully avoiding the self-powered life support machinery which kept the first Drambon rotating like an organic prayer wheel as they removed the retaining straps from the freight lashing points.

"We've arrived, Surreshun," said Conway. "In a few minutes you'll be able to say good-bye to that contraption for a few days. How is our friend?"

It was a purely rhetorical question because the second Drambon did not and perhaps could not speak. But if it could not converse it could at least react. Like a great, translucent jellyfish—it would have been completely invisible in water had it not been for its iridescent skin and a few misty internal organs—the Drambon undulated towards them. It curled around Conway like a thick, trans-

lucent cocoon for a moment, then transferred its attentions to Edwards.

"Ready when you are, Doctors."

"This is a much better entrance than your first one," said Conway as Edwards helped him manoeuvre Surreshun's life-support equipment out of the hold. "At least this time we know what we are doing."

"There is no need to apologise, friend Conway," said Surreshun in its flat, translated voice. "To a being of my high intelligence and ethical values, sympathy for the mental shortcomings of lesser beings and, of course, foregiveness for any wrongs they may have done me are but small facets of my generous personality."

Conway had not been aware that he was apologising, but to a being to whom the concept of modesty was completely alien it was possible that his words had sounded that way. Diplomatically he said nothing.

Surreshun belonged to a species which did not possess a heart or, for that matter, any other form of muscular pump to circulate its blood. Physically it resembled a large, fleshy doughnut which rolled continually because to stop rolling was to die—its ring-like body circulated while its blood, operating on a form of gravity feed system, remained still. Even the simplest form of medical treatment or surgery necessitated the doctor, the entire theatre staff, the instruments and lighting all being attached to an elaborate ferris wheel and rotating with the patient.

It was difficult to imagine how such an odd species had been able to evolve in the first place. Life for them must have begun in a large tidal basin so constituted that the tide washed continually around it instead of going in and out. Surreshun's remote ancestors would then have been very small, simple creatures which had been rolled continuously by the circular tides, picking up food from the sea bed as they went. Gradually they would have evolved specialised internal musculature and organs which had enabled them to do the rolling instead of trusting to the tides and currents,

also manipulatory and locomotor appendages in the shape of the fringe of short tentacles which sprouted from the inner edge of Surreshun's ring-like body between the sensory, respiratory, and ingestion orifices.

With physical specialisation had come intelligence, an increasing measure of control over their environment, nuclear power, and spaceflight—which was where Surreshun had first come on the scene, its capsule leaking water at a controlled rate while it tumbled along a rapidly decaying orbit giving every indication, to Earth-human eyes, that was, of being in a distressed condition.

So far as the crew of the Monitor Corps cruiser which had been orbiting the planet were concerned it was a simple rescue operation, even though they were in fact rescuing a perfectly healthy astronaut in a fully functioning space vessel. And later at Sector General Conway had almost made the misunderstanding a fatal one by trying to immobilise the being for treatment when the only time that Surreshun's species stopped moving was the moment they died.

Maybe he *had* been apologising to the being without being aware of it, which meant that his subconscious had more sense than he gave it credit for.

Two

LOCK Twenty-three's reception team arrived to help them move Surreshun's wheel to the entrance to the water-filled AUGL wards. The team leader, whose black suit had red and yellow striped arms and legs making him look like an updated court jester, swam up to Conway and touched helmets.

"Sorry about this, Doctor," his voice sounded, clearly if somewhat distorted by the transmitting media, "but an emergency has come up suddenly and I don't want to tie up the suit frequency. I'd like all you people to move into the

ward as quickly as possible. Surreshun has been through our hands before so we don't have to worry about it, just take charge of the other character wherever it is and . . . What the blazes!"

The other character had wrapped itself around his head and shoulders, pinioning his arms and nuzzling at him like a dog with a dozen invisible heads.

"Maybe it likes you," said Conway. "If you ignore it for a minute it will go away."

"Things usually do find me irresistible," said the team leader drily. "I wish the same could be said for females of my own species . . ."

Conway swam around and over it, grabbed two large handfuls of the flexible, transparent tegument covering its back and kicked sideways against the water until the being's front end was pointing towards the ward entrance. Great, slow ripples moved along its body and it began undulating towards the corridor leading to the AUGL ward like an iridescent flying carpet. Less gracefully Surreshun's ferris wheel followed close behind.

"An emergency, you said?"

"Yes, Doctor," said the team leader on the suit frequency. "But nothing will happen for another ten minutes, so I can use the suit radio if we keep it brief. My information is that a Kelgian DBLF on the Hudlar operating theatre staff was injured by a muscular spasm and involuntary movement of the patient's forward tentacles during the course of the op. The injuries are complicated by compression effects plus the fact that the constituents of that high-pressure muck which Hudlars breathe are highly toxic to the Kelgian metabolism. But it is the bleeding which is the real cause of the emergency. You know Kelgians."

"Yes, indeed," said Conway.

Even a small punctured or incised wound was a very serious matter for a Kelgian. They were giant, furry caterpillars and only their brain, which was housed in the blunt, conical head section was protected by anything resembling

a boney structure. The body consisted of a series of wide, circular bands of muscle which gave it mobility and served to protect, very inadequately, the vital organs within.

The trouble was that to give those tremendous bands of muscle an adequate blood supply the Kelgian pulse rate and pressure was, by Earth standards, abnormally high.

"They haven't been able to control the bleeding very well," the team leader went on, "so they are moving it from the Hudlar section two levels above us to the Kelgian theatre just below, and taking it through the water-filled levels to save time ... Excuse me, Doctor, here they come..."

Several things happened at once just then. With an untranslatable gurgle of pleasure Surreshun released itself from the wheel and went rolling ponderously along the floor, zig-zagging slowly among the patients and nursing staff who ranged from squat, crab-like Melfans to the forty-foot long tentacled crocodile who were natives of the ocean-covered world of Chalderescol. The other Drambon had twitched itself free of Conway's grip and was drifting away, while high up on the opposite wall a seal had opened and the injured Kelgian was being moved in, attended by too many people for Conway's assistance to be either necessary or desirable.

There were five Earth-humans wearing lightweight suits like his own, two Kelgians, and an Illensan whose transparent envelope showed the cloudy yellow of chlorine inside. One of the Earth-human helmets contained a head which he recognised, that of his friend Mannen who specialised in Hudlar surgery. They swarmed round the Kelgian casualty like a shoal of ungainly fish, pushing and tugging it towards the other side of the ward, the size of the shoal increasing as the reception team leader and his men swam closer to assess the situation. The Drambon jellyfish also moved closer.

At first Conway thought the being was merely curious,

but then he saw that the carpet of iridescence was undulating towards the injured being with intent.

"Stop it!" Conway shouted.

They all heard him because he saw them jerk as his voice rattled deafeningly from their suit phones. But they did not know and there was no time to tell them who, what, or even how to stop it.

Cursing the inertia of the water Conway swam furiously towards the injured Kelgian, trying to head the Drambon off. But the big, blood-soaked area of fur on the Kelgian's side was drawing the other like a magnet and, like a magnet, its attraction increased with the inverse square of the distance. Conway did not have time to shout a warning before the Drambon struck softly and clung.

There was a soft explosion of bubbles as the Drambon's probes ruptured the Kelgian's pressure litter and slid into the already damaged suit it had been wearing in the Hudlar theatre and through the thick, silvery fur beneath. Within seconds its transparent body was turning a deepening shade of red as it sucked the blood from the injured Kelgian.

"Quickly," Conway yelled, "get them both to the air-filled section!"

He could have saved his breath because everyone was talking and overloading the suit radio. The direct sound pickup was no help, either—all he could hear was the deep, water-borne growl of the ward's emergency siren and too many voices jabbering at once, until one very loud, translated Chalder voice roared out above the others.

"Animal! Animal!"

His strenuous swimming had overloaded the drying elements in his suit, but those words caused the sweat bathing his body to turn from hot to cold.

Not all the inhabitants of Sector General were vegetarians by any means, and their dietary requirements necessitated vast quantities of meat from extra-terrestrial as well as terrestrial sources to be shipped in. But the meat invariably arrived frozen or otherwise preserved, and for a very

good reason. This was to avoid cases of mistaken identity on the part of the larger, meat-eating life-forms who very often came into contact with smaller e-ts who frequently bore a physical resemblance to the former's favourite food.

The rule in Sector General was that if a being was alive, no matter what size or shape it might take, then it was intelligent.

Exceptions to this rule were very rare and included pets—non-violent, of course—belonging to the staff or important visitors. When a non-intelligent being entered the hospital by accident, protective measures had to be taken very quickly if the smaller intelligent life-forms were not to suffer.

Neither the medical staff engaged in transfering the casualty nor the reception team were armed, but in a few minutes time the alarm siren would bring corpsmen who would be and meanwhile one of the Chalder patients—all multi-tentacled, armoured, thirty feet of it—was moving in to remove the clinging Drambon with one or at most two bites of its enormous jaws.

"Edwards! Mannen! Help me keep it off!" Conway shouted, but there were still too many other people shouting for them to hear him. He grabbed two fistfulls of the Drambon's tegument and looked around wildly. The team-leader had reached the scene at the same time and he had pushed one leg between the injured Kelgian and the clinging SRJH and with his hands was trying to prise them apart. Conway twisted around, drew both knees up to his chin and with both feet booted the team-leader clear. He could apologise later. The Chalder was moving dangerously close.

Edwards arrived then, saw what Conway was doing and joined him. Together they kicked out at the gigantic snout of the Chalder, trying to drive it away. They could not hurt the brute, but were trusting the e-t not to attack two intelligent beings in order to kill an apparent animal who was attacking a third intelligent being. The situation was sufficiently confused, however, for a mistake to be made. It was

quite possible that Edwards and Conway could have their legs amputated from the waist down.

Suddenly Conway's foot was grabbed by a pair of large, strong hands and his friend Mannen swarmed along his body until their helmets were touching.

"Conway, what the blazes are you . . .?"

"There's no time to explain," he replied. "Just get them both to the air-filled section quickly. Don't let anyone hurt the SRJH, it isn't doing any harm."

Mannen looked at the being who was covering the Kelgian like an enormous, blood-red blister. No longer transparent, the blood of the injured nurse could actually be seen entering and being diffused throughout the Drambon's great, slug-like body which now seemed filled to bursting point.

"You could have fooled me," said Mannen, and pulled away. With one hand he gripped one of the Chalder's enormous teeth, swung round until he was staring it in an eye nearly the size of a football and with his other hand made jabbing, sideways motions. Looking confused the Chalder drifted away, and a few seconds later they were in the lock leading to the air-filled section.

The water drained out and the seal opened to show two green-clad Corpsmen standing in the lock ante-chamber, weapons at the ready. One of them cradled an enormous gun with multiple magazines capable of instantly anaesthetising any one of a dozen or more life-forms who came within the category of warm-blooded oxygen-breathers, while the other held a tiny and much less ferocious-looking weapon which could blast the life from a bull elephant or any e-t equivalent.

"Hold it!" said Conway, slipping and skidding across the still-wet floor to stand in front of the Drambon. "This is a VIP visitor. Give us a few minutes. Everything will be all right, believe me."

They did not lower their weapons, neither did they look as though they believed him.

"You'd better explain," said the team-leader quietly, but with the anger showing in his face.

"Yes," said Conway. "I, ah, hope you weren't hurt when I kicked you back there."

"Only my dignity, but I still——"

"O'Mara here," roared a voice from the communicator on the wall opposite. "I want vision contact. What's happening down there?"

Edwards was closest. He trained and focused the vision pickup as directed and said, "The situation is rather complicated, Major——"

"Naturally, if Conway has anything to do with it," said O'Mara caustically. "What is he doing there, praying for deliverance?"

Conway was on his knees beside the injured Kelgian checking on its condition. From what he could see the Drambon had attached itself so tightly that very little water had entered the pressure litter or the damaged protective suit—it was breathing normally with no indications of water in its lungs. The Drambon's colour had lightened again. No longer deep red, it had returned to its normal translucent iridescent colouring tinged only faintly with pink. As Conway watched, it detached itself from the Kelgian and rolled like a great, water-filled balloon to come to rest against the wall.

Edwards was saying "... A full report on this life-form three days ago. I realise three days is not a long time for the results to be disseminated throughout an establishment of this size, but none of this would have happened if the Drambon had not been exposed to a seriously injured being who——"

"With respect, Major," said O'Mara in a voice oozing with everything else but, "a hospital is a place where anyone at any time can expect to see serious illness or injury. Stop making excuses and tell me what *happened*!"

"The Drambon over there," put in the team-leader, "attacked the injured Kelgian."

"And?" said O'Mara.

"Cured it instantly," said Edwards smugly.

It was not often that O'Mara was lost for words. Conway moved to one side to allow the Kelgian, who was no longer a casualty, to climb to its multitudinous feet. He said, "The Drambon SRJH is the closest thing to a doctor that we have found on that planet. It is a leech-like form of life which practices its profession by withdrawing the blood of its patients and purifying it of any infection or toxic substances before returning it to the patient's body, and it repairs simple physical damage as well. Its reaction in the presence of severe illness or injury is instinctive. When the injured Kelgian appeared suddenly it wanted to help. The casualty was suffering from poisoning due to toxic material from the Hudlar theatre environment infecting the wound. So far as the Drambon was concerned it was a very simple case.

"Not all the blood withdrawn is returned, however," Conway went on, "and we have not been able to establish whether it is physiologically impossible for the being to return all of it or whether it retains a few ounces as payment for services rendered."

The Kelgian gave a low-pitched hoot like the sound of a modulated fog-horn. The noise translated as "It's very welcome, I'm sure."

The DBLF moved away then followed by the two armed corpsmen. With a baffled look at the Drambon the team-leader waved his men back to their stations and the silence began to drag.

Finally O'Mara said, "When you've taken care of your visitors and if there are no physiological reasons against it, I suggest we meet to discuss this. My office in three hours."

His tone was mild—a very bad sign. It might be a good idea if Conway roped in some moral as well as medical support for the meeting with the chief psychologist.

THREE

CONWAY asked his empath friend Prilicla to attend the meeting as well as the Monitor officers Colonel Skempton and Major Edwards, Doctor Manne, the two Drambons, Thornnastor, the Diagnostician-in-Charge of Pathology, and two medics from Hudlar and Melf who were currently taking courses at the hospital. It took several minutes for them all to enter O'Mara's enormous outer office—a room normally occupied only by the Major's aide and more than a score of pieces of furniture suited to the e-ts with whom O'Mara had professional contact. On this occasion it was the chief psychologist who occupied his assistant's desk and waited with visibly controlled impatience for everyone to sit, lie, or otherwise insinuate themselves into the furniture.

When they had done so O'Mara said quietly, "Since the period of high drama accompanying your arrival, I have caught up with the latest Meatball reports, and to know all is to forgive all—except, of course, your presence here, Conway. You were not due back for another three——"

"Drambo, sir," said Conway. "We use the native word-sound for it now."

"We prefer that," Surreshun's translated voice joined in. "Meatball is not an accurate name for a world covered with a relatively thin layer of animal life, or for what we consider to be the most beautiful planet in the galaxy—even though we have not as yet had an opportunity to visit any of the others. Besides, your translator tells me that Meatball as a name lacks accuracy, reverence, and respect. The continued use of your name for our glorious planet will not anger me—I have too great an understanding of the often shallow thinking engaged in by your species, too much sympathy for these mental shortcomings to feel anger or even irritation——"

"You're too kind," said O'Mara.

"That as well," agreed Surreshun.

"The reason I returned," Conway said hastily, "was simply to get help. I wasn't making any progress with the Drambo problem and it was worrying me."

"Worry," said O'Mara, "is a particularly useless activity—unless, of course, you do it out loud and in company. Ah, now I see why you brought half the hospital along."

Conway nodded and went on, "Drambo is badly in need of medical assistance, but the problem is unlike any other that we have already met on Earth-human or e-t planets and colonies. On those occasions it was simply a matter of investigating and isolating the diseases, bringing in or suggesting where the specifics could be distributed most effectively and then allowing the people affected to administer their own medicine through local doctors and facilities. Drambo is not like that. Instead of trying to diagnose and treat a large number of individuals, the patients are relatively few but very, very large indeed . . ."

Christened Meatball originally because Captain Williamson of the cultural contact and survey vessel *Descartes* had declined, very forcibly, to have such an odd and distasteful planet named after him, Drambo had to be seen to be believed—and even then it had been difficult for its discoverers to believe what they were seeing.

Drambo's oceans were a thick, living soup and its land masses were almost completely covered by slow-moving carpets of animal life. In many areas there were mineral outcroppings and soil which supported vegetable life, and other forms of vegetation grew in the water, on the sea bed, or rooted itself on the organic land surface. But the greater part of the land surface was covered by a layer of animal life which in some places was half a mile thick.

This vast organic carpet was subdivided into strata which crawled and slipped and fought their way through each other to gain access to necessary top-surface vegetation or sub-surface minerals or simply to choke off and cannibalise each other. During the course of this slow, gargantuan

struggle these living strata heaved themselves into hills and valleys, altering the shapes of lakes and coastlines and changing the whole topography of their world from month to month.

That the planet possessed intelligent life there was no doubt. During the first and very brief landing, when the ground had done its best to swallow them, *Descartes* had been penetrated by a small, completely unspecialised, thought-controlled tool. And later when it had returned to orbit they had witnessed the first manned spaceflight and mistakenly rescued the astronaut Surreshun thinking that its vehicle was out of control.

But Surreshun's race were not the makers of those fabulous tools. Somewhere there was still another intelligent race native to the planet, and Drambo itself was a very sick world . . .

". . . The reason for this is that within the past few years Surreshun's race has learned how to liberate atomic energy," Conway went on, then added, "Explosively, of course, and with vast quantities of radiational dirt. They are very . . ." he hesitated, trying to find a diplomatic word for careless, or criminally stupid or suicidal, and failing, ". . . proud of their new-found ability to kill large areas of the strata creatures and render the shallows around these living coastlines safe for their expanding population.

"But living in or under and perhaps controlling these strata creatures is yet another intelligent race whose land is quite literally in danger of dying all around them," Conway continued. "These people made the tool which came aboard *Descartes*, and judging by that gadget they are highly advanced indeed. But we still know nothing at all about them . . ."

It had been generally agreed by the specialists on *Descartes* that if Drambo possessed intelligent life it should take one of two forms, and both were a possibility. The first type would be large—one of the tremendous, living carpets which might be capable of anchoring itself to the under-

lying rock while pushing extensions towards the surface for the purpose of breathing, ingestion, and the elimination of wastes. It should also possess a means of defence around its far-flung perimeter to keep less intelligent strata creatures from insinuating themselves between it and the ground below or from slipping over it and cutting off light, food, and air as well as discouraging sea predators large and small who seemed to nibble at it around the clock.

The second possibility might be a fairly small life-form, smooth-skinned, flexible, and fast enough to allow them to live inside or between the strata creatures and avoid the ingestive processes of the strata beasts whose movements and metabolism were slow. Their homes, which would have to be safe enough to protect their young and develop their culture and science, would probably be in caves or tunnel systems in the underlying rock.

"... When it became clear that Surreshun's people were not the tool-makers," Conway went on, "we asked ourselves where they would be most likely to be found, and the answer was in those areas where their living country was under attack. It was in this situation that I expected to find their medical people as well, and I did in fact find our transparent friend here. It saved my life, in its rather disconcerting fashion, and I'm convinced that it is the Drambon equivalent of a doctor. Unfortunately it does not seem to be able to communicate in any fashion that I can understand and, bearing in mind the fact that anyone can directly observe its innards without the necessity for X-rays, there doesn't seem to be a localised gathering of nerve ganglia or indeed anything at all resembling a brain.

"We badly need the help of its people," Conway added seriously, "which is the reason for bringing it here so that a specialist in e-t communications can succeed, perhaps, where the ship's contact experts and myself failed."

He looked pointedly at O'Mara, who was looking thoughtfully at the leech-like Drambon. It in turn had put

one of its eyes into a pseudopod and had extended it towards the ceiling so that it could look at the fragile, insect-like figure of the empath Prilicla. Prilicla had enough eyes to look everywhere at once.

"Isn't it odd," said Colonel Skempton suddenly, "that one of your Drambons is heartless and the other appears to be brainless?"

"Brainless doctors I am used to," said O'Mara drily. "I communicate with them, on the whole successfully, every day. But this isn't your only problem?"

Conway shook his head. "I've already said that we have to treat a small number of very large patients. Even with the assistance of all the Drambon medical people I would still need help in charting—and I do mean charting by photo-reconnaissance—the extent of the trouble as accurately as possible and probing sub-surface areas. X-rays on this scale are impossible, a full-scale drilling operation to withdraw deep tissue samples would be of little use either since the drill would be a short and impossibly fine needle. So we will need to investigate the diseased or damaged areas in person using armoured ground-cars and, where possible, our hands and feet inside heavy duty spacesuits. Entrance to the affected areas will be through natural body openings, and the exercise will go much faster if we have the help of people with medical training who do not need the protection of armoured vehicles and suits. I'm thinking of species like the Chalders and Hudlars and Melfans who are armoured already.

"From Pathology," he went on, looking towards Thornnastor, "I would like suggestions for providing a cure by surgery rather than medication. Present indications are that the trouble will be largely the result of radiation poisoning, and while I realise that we can cure even advanced cases these days, the treatment may well be impossible to apply to patients this size, not to mention the fact that the regenerative medication required for only one of them could represent the total output of that drug from a dozen planets

for many years. Hence the necessity for a surgical solution."

Skempton cleared his throat and said, "I begin to see the scope of your problem, Doctor. My part will be in organising transport and supplies for your medical people. I'd also suggest a full battalion of engineers to set up and maintain the special equipment . . ."

"To begin with," said Conway.

"Naturally," said the Colonel a trifle coldly, "we shall continue to assist you in whatever——"

"You misunderstood me, sir," said Conway. "I can't be sure just how much help we will need at the present time, but I had been thinking in terms of a full sector sub-fleet armed with long-range lasers, surface-penetrating torpedoes, tactical atomic weapons—clean, of course—and whatever other forms of frightfulness you can suggest that are both concentrated and capable of being directed accurately.

"You see, Colonel," Conway concluded, "surgery on this scale will mean that the operation will be military rather than surgical." To O'Mara he added, "Those are a few of the reasons for my unscheduled return. The others are less urgent and . . ."

"Can damn well wait until this lot are sorted out," said O'Mara firmly.

The meeting broke up shortly after that because neither Surreshun nor Conway could give any information on Drambo which was not already available in the Corps reports. O'Mara retreated into his inner office with the Drambon doctor, Thornnastor and Skempton returned to their quarters and Edwards, Mannen, Prilicla, and Conway, having first seen to the comfort of Surreshun in the AUGL tank, headed for the cafeteria reserved for warm-blooded oxygen-breathers to refuel. The Hudlar and Melfan doctors went along to find out more about Drambo and to watch the others eat. As very recent additions to the hospital staff in the first flush of enthusiasm, they were spending every available minute observing and talking to e-ts.

Conway knew the feeling. It was still very much with him, but nowadays he was practical enough to use as well as admire the enthusiasm of the new boys . . .

FOUR

LIKE the rest of its species the Hudlar was a squat, immensely powerful being with a tegument like flexible metal. It absorbed food direct from the thick soup-like air of its native planet, a world whose gravity and pressure were many times that of Earth. Hudlars weighed in the region of two Earth tons and their incredibly hard but flexible tegument, as well as protecting them from the crushing external pressure of their home world, allowed them to live comfortably for long periods in atmospheres of lesser pressure down to and including the vacuum of space. In addition they had the highest known tolerance for radiation among intelligent species, which would make them particularly useful in the Drambon operation.

"The Chalders are tough and mobile enough to hold their own against the native predators," Conway said as they distributed themselves around a table designed for Tralthan FGLIs—the Earth-human DBDG tables were all taken, by Kelgians—and dialled their orders. "You Melfans are very fast movers on the sea bed and your legs, being mostly osseus material, are proof against the poisonous plants and spines growing on the ocean floor. Hudlars, however, while slow-moving do not have to worry about anything less than an armour-piercing shell hurting them and the water all over the planet is so thick with vegetable and animal life anxious to attach itself to any smooth surface that you could throw away your food-spraying gear and live completely off the sea."

"It sounds like heaven," said the Hudlar, its flat, translated tone making it impossible to tell whether or not it was being sarcastic. "But you will need large numbers of doc-

tors in all three species—far too many to be supplied by the hospital even if everyone on the staff was allowed to volunteer."

"We'll need hundreds of you," Conway replied, "and Drambo isn't heaven even for Hudlars. At the same time I thought there might be doctors—young, still-restless, newly qualified people—anxious for e-t experience . . ."

"I'm not Prilicla," said Mannen, laughing, "but even I can sense that you are preaching to the converted. Do you *like* lukewarm steak, Conway?"

For several minutes they concentrated on eating so that the gentle breeze produced by Prilicla's wings—it preferred to hover during meals, claiming that flying aided its digestion—would not ruin everything but the ice cream.

"At the meeting," said Edwards suddenly, "you mentioned other, less urgent problems. I expect the recruiting of thick-skinned beasties like Garother here was one of them. I'm afraid to ask about the others . . ."

Conway said, "We will need on-the-spot advice during this large-scale medical examination, which means doctors, nurses, and medical technicians experienced in the processing and analysis of specimens covering the widest possible range of life-forms. I am going to have to talk Thornnastor into releasing some of his pathology staff . . ."

Prilicla side-slipped suddenly and almost put one of its pencil-thin legs into Mannen's dessert. It was trembling slightly as it flew, a sure sign that someone at the table was radiating strong and complicated emotions.

"I'm still not Prilicla," said Mannen, "but from the behaviour of our empathic friend I would guess that you are seeking, and trying to justify, a much closer liaison with the pathology department and especially a nurse called Murchison. Right, Doctor?"

"My emotions are supposed to be privileged," said Conway.

"I did not say a word," said Prilicla, who was still finding difficulty in maintaining a stable hover.

Edwards said, "Who's Murchison."

"Oh, a female of the Earth-human DBDG classification," said Garoth through his translator. "A very efficient nurse with theatre experience and subsequent nursing of over thirty different life-forms. Personally I have found her pleasant and polite, so much so that I am able to ignore the, to me, physically repellant slabs of adipose overlaying much of her musculature. Most of the DBDG females have this unsightly, doughy look, and some of them are even more top-heavy than Nurse Murchison."

"And you're bringing her back to Drambo with you?" asked Edwards hopefully. The Monitor Corps had very old-fashioned ideas about mixed crews, even on long survey missions.

"Only," said Mannen gravely, "if he's given half a chance."

"We need a pathology team," said Conway, ignoring him. "But even more we need local medical help. Surreshun's people, for physiological reasons, can give us only moral support, which means that everything depends on gaining the co-operation of our leech-like friends. This is where you come in, Prilicla. You were monitoring its emotional radiation during the meeting. Any ideas?"

Prilicla alighted gently on the unoccupied end of the table and began to tremble again. Of physiological classification GLNO—insectile, exoskeletal with six pipe-stem legs, a pair of not quite atrophied wings, and a highly developed empathic faculty—only on Cinruss with its one-eighth Earth gravity could a race of insects have grown to such dimensions and developed intelligence and a high civilisation.

It was well-liked by everyone. Prilicla's empathic faculty saw to it that the little being always said and did the right thing—being an emotion-sensitive to do otherwise would mean that the feelings of anger and sorrow which a thoughtless word or action would cause would bounce back and figuratively smack it in the face. So the Cinrusskin was

forced constantly to lie and evade and always be considerate in order to make the emotional radiation of the people around it as pleasant for itself as possible.

Except when its professional duties exposed it to pain and violent emotion or when it was in the position, as now, of not being able to help with or evade the problem.

"I'm afraid not, friend Conway," said the empath. "During the whole of the meeting the Drambon doctor was conscious and aware, but it did not react to anything that was said or done or engage in any concentrated thinking. It emoted only feelings of well-being, repletion, and self-satisfaction."

"It certainly did a good job on that Kelgian," said Edwards, "and to a leech the pint or so of blood it syphoned off . . ."

Prilicla waited politely for the interruption to cease, then went on, "There was a very brief heightening of interest detectable when members of the meeting first entered the room—the emotion was not one of curiosity, however, but more like the increase of awareness necessary for a cursory identification."

"Was there any indication that the trip here had affected it?" asked Conway. "Impaired its physical or mental faculties, anything like that?"

"It was thinking only contented thoughts," replied Prilicla, "so I would say not."

They discussed the Drambon doctor until they were about to leave the dining hall, when Conway said, "O'Mara will be glad of your help, Prilicla, while he is putting our blood-sucking friend through his psychological hoops, so I would be grateful if you could monitor its emotional radiation while contact is being established. The Major may want to wait until communication is complete and a special translator pack has been programmed for the Drambon before contacting me. But I would like to have any useful information as you get it . . ."

They parted and Conway went in search of Murchison.

To a two-ton, tentacled armadillo like Gorath she appeared somewhat doughy and top-heavy, no doubt, but the Earth-human males among the staff found themselves unable to view her physiological features with anything resembling clinical detachment. She, on the other hand, seemed to have no trouble regarding everyone else that way, the sole exception being Senior Physician Conway. This was not a situation which he would endanger by taking her too much for granted, so he had better talk to her before he put through a formal request for her transfer to Drambo.

But getting a chance to talk to her was no easy matter. Her free periods always seemed to coincide with the times Conway was giving his introductory lectures—they were little more than recruiting speeches—on Drambon flora, fauna, and social customs of the intelligent rollers. An illustrated lecture suited to the visual range and given in surroundings comfortable to an e-t audience was something which could not be interrupted easily. But during his free periods, which were few and very brief, it was usually a bad time for Murchison, like three hours before breakfast. His only chance to talk to her occurred just two hours before he was due to leave for Drambo again.

Even then it was a brief exchange in the Illensan operating theatre in the midst of the yellow chlorine fog which the natives of Illensa breathed, and there was about as much privacy as in a high-density space shuttle. The high temperature of the area had forced the Earth-human members of the team to wear very little under their lightweight suits so that her physiological features were most attractively packaged. But she was rushed and Conway had time only to say a verbal good-bye and mutter something about how useful she would be to him on Drambo before Thornnastor shushed them thunderously and called the team to attention.

As he was about to go aboard with Edwards and the first batch of recruits—a very carefully chosen few who would, he hoped, by their enthusiasm attract and instruct many

more—the PA began quietly insisting that Doctor Conway contact Major O'Mara at once, its insistence reinforced by the repeated double-chime which preceded most urgent signals. He waved the others ahead and went to the lock's communicator.

"Glad I caught you," said the chief psychologist before Conway could do anything more than identify himself. "Listen, don't talk. Prilicla and I are getting nowhere with your Drambon medic. It emotes but we can't get it excited about anything so that we cannot even establish its likes and dislikes.

"We *know* that it sees and feels," O'Mara went on, "but we aren't sure if it can hear or talk or, if it can, how it does these things. Prilicla thinks it may have a low form of empathy, but until we can put a few ripples into its even disposition there is no way of proving that. I am not admitting that I'm beaten, Conway, but you have handed us a problem which may have a very simple solution——"

"Did you try it with the thought-controlled tool?"

"That was the first, second, and twenty-eighth thing we tried," said O'Mara sourly. "Prilicla detected a very slight heightening of interest consistent, it says, with the identification of a familiar object. But the Drambon made no attempt to control the gadget. I was saying that you handed us a problem. Maybe the simplest answer would be for you to hand us another just like it."

The chief psychologist disliked having to give unnecessary explanations almost as much as people who were slow on the uptake, so Conway thought for a moment before saying, "So you would like me to bring back another Drambon medic so that you could observe and eavesdrop on their conversation when they meet, and reproduce the method on the translator . . ."

"Yes, Doctor, and fast," said O'Mara, "before your chief psychologist needs a psychiatrist. Off."

It was not possible for Conway to immediately seek out, kidnap, or otherwise acquire another leech-like SRJH on his

return to Drambo. He had a group of e-ts of widely varying dietry, gravity, and atmosphere requirements to attend to and, while all three life-forms could exist without too much difficulty in the Drambon ocean, their quarters on *Descartes* had to have some of the comforts of home.

They also had to be given some appreciation of the scope of the medical problem they were being asked to help solve, and this entailed many 'copter flights over the strata creatures. He showed them the great tracks of living "land" covered with the tiny, long-rooted plants which might or might not serve as the strata beasts' eyes—the leaves rolled back tightly to reveal their bright undersides when the helicoptor's shadow passed over them, and opened out again a few seconds after it had passed. It was as if their shadow was a high persistency yellow spot on a bright green radar screen. And he showed them the coastlines, which were much more dramatic.

Here the sea predators, large and small, tore at each other and at the periphery of the great land beasts, stirring the thick, turgid ocean into yellow foam streaked and stained with red. It was in an area like this, where Conway had judged the strata beast's need for protection had been greatest, that he had found the leech-like SRJHs and where, as soon as he could possibly manage it, he must look for another.

But this time he would have lots of willing and specialised help.

Every day there was a message from O'Mara, different only in the mounting impatience evident between the lines. Prilicla and the chief psychologist were having no success with the Drambon doctor and had come to the conclusion that it used one of the exotic visio-tactile languages which were virtually impossible to reproduce without a detailed sight-touch vocabulary.

Five

The first expedition to the coast was in the nature of a rehearsal—at least, it started out that way. Camsaug and Surreshun, two Drambon rollers who Conway already knew well, took the lead, wobbling and wheeling along the uneaven sea bed like a pair of great organic doughnuts. They were flanked by two crab-like Melfans who were easily capable of scuttling along twice as fast as the Drambons could roll, while a thirty-foot scaled and tentacled Chalder swam ponderously above them ready to discourage local predators with its teeth, claws, and great, boney club of a tail—although in Conway's opinion one look from any one of its four extensible eyes would be enough to discourage anything with the slightest will to live.

Conway, Edwards, and Garoth travelled in one of the Corps's surface cruisers, a vehicle capable not only of moving over any conceivable topography but of going over, through or under the sea as well as being able to hover for a limited period in the air. They kept just far enough in the rear to keep everyone else in sight.

They were headed towards a dead section of coast, a deep strip of the strata beast which Surreshun's people had killed to give themselves more protected rolling space. They had accomplished this by lobbing a series of very dirty atomic bombs ten miles inland and then waiting while the living coastline stopped killing and eating and drinking, and the coastline predators lost interest in the dead meat and left.

Fallout did not concern the rollers because the prevailing wind blew inland. But Conway had deliberately selected a spot which was only a few miles from a stretch of coast which was still very much alive, so that with any luck their first examination might turn out to be something more than an autopsy.

With the departure of the predators the sea's plant-life

had moved in. On Drambo the division between plant and animal life was rarely sharp and all animals were omnivorous. They had to travel along the coast for nearly a mile before finding a mouth that was not either closed too tightly or too badly overgrown to allow entry, but the time was not wasted because Camsaug and Surreshun were able to point out large numbers of dangerous plants that even the heavily armoured e-ts should avoid whenever possible.

The practice of extra-terrestrial medicine was greatly simplified by the fact that the illnesses and infections of one species were not transmittable to another. But this did not mean that poisons or other toxic material secreted by e-t animals and plants could not kill, and on the Drambon sea bed the vegetation was particularly vicious. Several varieties were covered with poisoned spines and one acted as if it had delusions of being a vegetable octopus.

The first usable mouth looked like an enormous cavern. When they followed the rollers inside the vehicle's spotlights showed pallid vegetation waving and wriggling slowly to the limit of vision. Surreshun and Camsaug were rolling out unsteady figure-of-eights on the densely overgrown floor and apologising for the fact that they could not take the party any farther without risking being stopped.

"We understand," said Conway, "and thank you."

As they moved deeper into the enormous mouth the vegetation became sparse and more pallid, revealing large areas of the creature's tissue. It looked coarse and fibrous and much more like vegetable rather than animal material, even allowing for the fact that it had died several years earlier. The roof began suddenly to press down on them and the forward lights showed the first serious barrier, a tangle of long, tusk-like teeth so thick that they looked like the edge of a petrified forest.

One of the Melfans was the first to report. It said, "I cannot be absolutely sure until Pathology checks my specimens, Doctor Conway, but the indications are that the creature's teeth are vegetable rather than animal osseus

material. They grow thickly on both the upper and lower surfaces of the mouth and to the limit of our visibility. The roots grow transversely so that the teeth are free to bend forwards and backwards under steady pressure. In the normal position they are angled sharply towards the outer orifice and act as a killing barrier to large predators rather than as a means of grinding them into small pieces.

"From the position and condition of several large cadavers in the area," the Melfan went on, "I would say that the creature's ingestion system is very simple. Sea-water containing food animals of all sizes is drawn into a stomach or pre-stomach. Small animals slip through the teeth while large ones impale themselves, whereupon the inward current and the struggles of the animal concerned cause the teeth to bend inwards and release it. I assume that the small animals are no problem but that the big ones could do serious damage to the stomach before the digestive system neutralises them, so they have to be dead before they reach the stomach."

Conway directed the spotlight towards the area containing the Melfan and saw it wave one of its mandibles. He said, "That sounds reasonable, Doctor. It wouldn't surprise me if the digestive processes are very slow indeed—in fact, I'm beginning to wonder if the creature is more vegetable than animal. An organism of normal flesh, blood, bone, and muscle of this size would be too heavy to move at all. But it moves, and does everything else, very slowly . . ." He broke off and narrowed the beam for maximum penetration, then went on, "You had better get aboard so we can burn a way through those teeth."

"No need, Doctor," said the Melfan. "The teeth have decayed and are quite soft and brittle. You can simply drive through them and we will follow."

Edwards allowed the cruiser to sink to the floor, then moved it forward at a comfortable scuttling pace for Melfans. Hundreds of the long, discoloured plant-teeth snapped

and toppled slowly through the cloudy water before they were suddenly in the clear.

"If the teeth are a specialised form of plant life," said Conway thoughtfully, "they occupied a very sharply defined area, which suggests that someone is responsible for planting them."

Grunting assent, Edwards checked to see that everyone had come through the tunnel they had just made, then he said, "The channel is widening and deepening again, and I can see another presumably specialised form of plant-life. Big, isn't it? There's another. They're all over the place."

"This is far enough," said Conway. "We don't want to lose sight of the way out."

Edwards shook his head. "I can see openings on both sides just like this one. If the place is a stomach, and it looks big enough, there are several inlets."

Angry suddenly, Conway said, "We know that there are hundreds of these mouths in this dead section alone and the number of stomachs is anybody's guess—great, flat, hollow caverns miles across if that radar isn't telling fluorescent lies. We aren't even *nibbling* at the problem!"

Edwards made a sympathetic noise and pointed ahead. "They look like stalactites that have gone soft in the middle. I wouldn't mind taking a closer look."

Even the Hudlar went out to have a closer look at the great, sharply-curved pillars which supported the roof. Using their portable analysers they were able to establish that the pillars were a part of the strata beast's musculature and not, as they had earlier thought, another form of plant-life—although the surface of all the muscular supports in the area were covered with something resembling outsize seaweed. The blisters were nearly three feet across and looked about ready to burst. A Melfan taking a specimen of the underlying muscle accidentally touched one and it did burst, triggering off about twenty others in the vicinity. They released a thick, milky liquid which spread rapidly and dissolved in the surrounding water.

The Melfan made untranslatable noises and scuttled backwards.

"What's wrong?" said Conway sharply. "Is it poisonous?"

"No, Doctor. There is a strong acid content but it is not immediately harmful. If you were a water-breather you would say that it stinks. But look at the effect on the muscle."

The great pillar of muscle rooted firmly to both floor and roof was quivering, its sharp curve beginning to straighten out.

"Yes," said Conway briskly, "this supports our theory about the creature's method of ingestion. But now I think we should return to *Descartes*—this area may not be as dead as we thought."

Specialised teeth plants served as a filter and killing barrier to food drawn into the creature's stomach. Other symbiotic plants growing on the muscle pillars released a secretion which caused them to stiffen, expand the stomach, and draw in large quantities of food-bearing water. Presumably the secretion also served to dissolve the food, digest it for assimilation through the stomach wall or by other specialised plants—they had taken enough specimens for Thornnastor to be able to work out the digestive mechanism in detail. When the power of the digestive secretion had been diluted by the food entering the stomach their effect on the muscles diminished, allowing the pillars to partially collapse again and expelled undigested material.

Blisters were beginning to rupture off the other pillars now. By itself that did not mean that the beast was alive, only that a dead muscle could still respond to the proper stimulus. But the cavern roof was being pushed up and water was flowing in again.

"I agree, Doctor," said Edwards, "let's get out of here. But could we leave by a different mouth—we might learn something from a stretch of new scenery."

"Yes," said Conway, with the uncomfortable feeling that

he should have said no. If dead muscles could twitch, what other forms of involuntary activity were possible to the gigantic carcass? He added, "You drive, but keep the cargo hatch and personnel lock open—I'll stay outside with the e-ts . . ."

A few minutes later Conway was hanging on to a handy projection as the vehicle followed the e-ts into a different mouth opening. He hoped it was a mouth and not a connection with something deeper inside the beast, because Edwards reported that it was curving towards a live area of coast. But before the lowering temperature of his feet could affect his speech centres enough for him to order them back the way they had come, there was an interruption.

"Major Edwards, stop the cruiser, please," said one of the Melfans. "Doctor Conway, down here. I think I have found a dead . . . colleague."

It was a Drambon SRJH, no longer transparent but milky and shrivelled with a long, incised wound traversing its body, drifting and bumping along the floor.

Thornnastor will be pleased with you, friend," said Conway enthusiastically. "'And so will O'Mara and Prilicla. Let's get it aboard with the other specimens. Oh, I'm not a water-breather, but . . ."

"It doesn't," the Melfan replied to the unspoken question. "I'd say that it was too recently dead to be offensive."

The Chalder came sweeping back, its tentacles gripped the dead SRJH and transferred it to the refrigerated specimen compartment, then it returned to its position. A few seconds later one flat, toneless, translated word rasped in their receivers.

"Company."

Edwards directed all his lights ahead to show a fighting, squirming menagerie practically filling the throat ahead. Conway identified two kinds of large sea predators who had obviously been able to batter a way through the brittle teeth, several smaller ones, about ten SRJHs and a few large-headed, tentacled fish that he had never seen before. It was

impossible to tell at first which were fighting which or even if it mattered to the beings concerned.

Edwards dropped the vehicle to the floor. "Back inside! Quickly!"

Half-running, half-swimming towards the vehicle, Conway envied the underwater mobility of the Melfans so much that it hurt. He overtook the Hudlar who had the jaws of a big predator locked on its carapace. Just above him one of the new life-forms had an SRJH wrapped around it, the Drambon doctor already turning red as it treated its patient in the only way it knew how. There was a deep, reverberating clang as another predator charged the cruiser, smashing two of their four lights.

"Into the cargo hold!" Edwards shouted hoarsely. "We've no time to fiddle about with personnel locks!"

"Get off me, you fool," said the Hudlar with the predator on its back. "I'm inedible."

"Conway, behind you!"

Two big predators were coming at him along the bottom while the Chalder was shooting in from the flank. Suddenly there was a Drambon doctor undulating rapidly between the leading predator and Conway. It barely touched the beast but the predator went into a muscular spasm so violent that parts of its skeleton popped white through the skin.

So you can kill as well as cure, thought Conway gratefully as he tried to avoid the second predator. The Chalder arrived then and with a swipe of its armoured tail cleared the Hudlar's back while simultaneously its enormous maw opened and crashed shut on the second predator's neck.

"Thank you, Doctor," said Conway. "Your amputation technique is crude but effective."

"All too often," replied the Chalder, "we must sacrifice neatness for speed . . ."

"Stop chattering and get *in*!" yelled Edwards.

"Wait! We need another local medic for O'Mara," began Conway, gripping the edge of the hatch. There was a

Drambon doctor drifting a few yards away, bright red and obliviously wrapped around its patient. Conway pointed and to the Chalder said, "Nudge it inside, Doctor. But be gentle, it can kill, too."

When the hatch clanged shut a few minutes later the cargo hold contained two Melfans, a Hudlar, the Chalder, the Drambon SRJH with its patient and Conway. It was pitch dark. The vehicle shuddered every few seconds as predators crashed against its hull, and conditions were so cramped that if the Chalder moved at all everyone but the armour-plated Hudlar would have been mashed flat. Several years seemed to go past before Edward's voice sounded in Conway's helmet.

"We're leaking in a couple of places, Doctor—but not badly and it shouldn't worry water-breathers in any case. The automatic cameras have some good stuff on three new internal life-forms being helped by local medics. O'Mara will be very pleased. Oh, I can see teeth ahead. We'll soon be out of this . . ."

Conway was to remember that conversation several weeks later at the hospital when the living and dead specimens and film had been examined, dissected, and viewed so often that the leech-like Drambons undulated through his every dream.

O'Mara was *not* pleased. He was, in fact, extremely displeased—with himself, which made things much worse for the people around him.

"We have examined the Drambon medics singly and together, friend Conway," said Prilicla in a vain attempt to render the emotional atmosphere in the room a little more pleasant. "There is no evidence that they communicate verbally, visually, tactually, telepathically, by smell or any other system known to us. The quality of their emotional radiation leads me to suspect that they do not communicate at all in the accepted sense. They are simply aware of other beings and objects around them and, by using their eyes and a mechanism similar to the empathic

faculty which my race possesses, are able to identify friend and foe—they attacked the Drambon predators without hesitation, remember, but ignored the much more visually frightening Chalder doctor who was feeling friendship for them.

"So far as we have been able to discover," Prilicla went on, "its emphatic faculty is underdeveloped and not allied to intelligence. The same applies to the second Drambon native you brought back, except that it is . . ."

"*Much* smarter," O'Mara finished sourly. "Almost as smart as a badly retarded dog. I don't mind admitting that for a while I thought our failure to communicate may have been due to a lack of professional competence in myself. But now it is clear that you were simply wasting our time giving sophisticated tests to Drambon animals."

"But that SRJH saved me."

"A very highly specialised but non-intelligent animal," said O'Mara firmly. "It protects and heals friends and kills enemies, but it does not *think* about it. As for the new specimen you brought in, when we exposed it to the thought-controlled tool it emoted awareness and caution—a feeling similar to our emotional radiation if we were standing close to a bare power line—but according to Prilicla it did not think at or even about the gadget.

"So I'm sorry, Conway," he ended, "we are still looking for the species responsible for making those tools, and for intelligent medical assistance with your own problem."

Conway was silent for a long time, staring at the two SRJHs on O'Mara's floor. It seemed all wrong that a creature responsible for saving his life should have done so without thought or feeling. The SRJH was simply a specialist like the other specialised animals and plants inhabiting the interior of the great strata beasts, doing the work it had evolved to do. Chemical reactions were so slow inside the strata creatures—the material was too diluted for them to be otherwise since its blood might be little more

than slightly impure water—that specialised plant and animal symbiotes could produce the secretions necessary for muscle activity, endocrine balance, supplying nourishment to and removing waste material from large areas of tissue. Other specialised symbiotes handled the respiration cycle and gave vision of a kind on the surface.

"Friend Conway has an idea," said Prilicla.

"Yes," said Conway, "but I would like to check it by getting the dead SRJH up here. Thornnastor hasn't done anything drastic to it yet, and if something should happen to it we can easily get another. I would like to face the two living SRJHs with a dead colleague.

"Prilicla says that they do not emote strongly about anything," Conway added. "They reproduce by fission so there can be no sexual feeling between them. But the sight of one of their own dead should cause some kind of reaction."

O'Mara stared hard at Conway as he said, "I can tell by the way Prilicla is trembling and by the smug look on your face that you think you have the answer. But *what* is likely to happen? Are these two going to heal and resuscitate it? Oh, never mind, I'll wait and let you have your moment of medical drama . . ."

When the dead SRJH arrived Conway quickly slid from the litter on to the office floor and waved O'Mara and Prilicla back. The two living SRJHs were already moving purposefully towards the cadaver. They touched it, flowed around and over it and for about ten minutes were very busy. When they had finished there was nothing left.

"No detectable change in emotional radiation, no evidence of grief," said Prilicla. It was trembling but its own feelings of surprise were probably responsible for that.

"*You* don't look surprised, Conway," said O'Mara accusingly.

Conway grinned and said, "No, sir. I'm still disappointed at not making contact with a Drambon doctor, but these

beasties are a very good second best. They kill the strata beast's enemies, heal and protect its friends and tidy up the debris. Doesn't that suggest something to you? They aren't doctors, of course, just glorified leucocytes. But there must be millions of them, and they're all on our side . . ."

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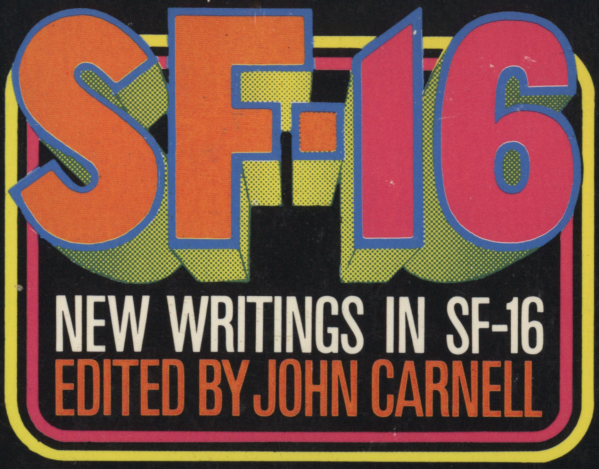

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