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Kenneth Bulmer

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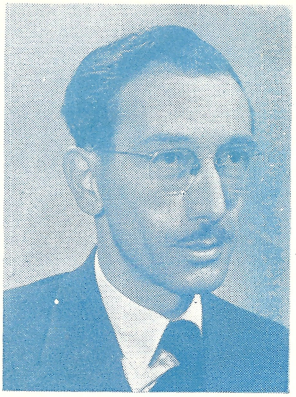

Since his return from the United States, where he was official British representative at the 1955 World Science Fiction Convention at Cleveland in September, can be rated as Britain's hardest working science fiction writer. Apart from numerous fiction contributions he is also one half of "Kenneth Johns," collaborating with science writer John Newman in the production of articles for numerous publications.

Has been reading and writing science fiction for longer than he cares to remember, starting both while still at school in the early 1920's. During the 1939-45 war he served with the Royal Corps of Signals and published and edited a Service magazine in Africa, Sicily and Italy. It was while basking in the Italian sunshine that he first heard an atomic bomb had been detonated over Japan—and thought it was just another hoax of his comrades.

He has long been closely connected with the science fiction enthusiast field where he is a leading and respected figure attending most of the London and regional meetings whenever they are held. Since the above photograph was taken just before his American trip he has grown a pointed beard and is not so easily recognisable and was twice mistaken in New York for well-known writer Fletcher Pratt.

His other hobbies include model ship construction, motor racing, and the study of the Napoleonic legend—psychiatrists are cordially invited to make the logical deduction.

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Death of a Corpse

For several years now leading British reviewers and critics of literature have been trying to find some reason for not accepting science fiction into the world of letters and through the medium of radio and the national press we have been treated to a number of face-saving movements which have left the intellectuals secure in their lofty paradise and the body of science fiction a corpse at their feet.

The postmortem was held on January 30th in the BBC's " Books and Authors " TV programme with author-playwright J. B. Priestley in the role of the coroner and thriller-writer Edmund Crispin as the mortician, wherein they endeavoured to find by way of assumption a pattern of behaviour for science fiction which would fit into the accepted framework of modern literature. Very unfortunately, I thought, Mr. Priestley had chosen two books of short stories upon which to base his assumptions—admitting early in the programme that he had read very little of this type of fiction before—both books being collections of *American* stories; one the Faber *Best S-F* edited by Mr. Crispin himself, the other the recent *Stories For Tomorrow* edited by William Sloan and published by Cassell. Little wonder that Mr. Priestley complained rather bitterly that science fiction had a predominantly American flavour, which he deplored.

Even more unfortunate was the fact that, having obviously based the interview on the *short story*, they proceeded to try and fit the science fiction *novel* into a literary category without any foundation upon which to base their opinions. There was a brief passing reference to authors Wyndham and Christopher being very good, but while Clarke was considered " most ingenious " in his plots neither considered that he was a good writer. No indication was given to the viewing audience by either Mr. Priestley or Mr. Crispin that science fiction (as the term applies today) has been built entirely through the short story medium over the past thirty years while the novel labelled " science fiction " has only been with us for seven and is still in its infancy. Yet before science fiction became a trade name there were hundreds of outstanding novels written by prominent authors—a glance at the Antiquarian Bookmans' bible, *The Checklist Of Fantastic Literature*—reveals a host of prominent writers who have at some time or another used science fiction or fantasy as the background to the modern novel; Golding, Sherriff, Orwell, Wheatley, Collier, Stapledon, Christie, Wells, Doyle, and even Priestley himself !

Mr. Priestley thought there was a general prejudice against science fiction because there was too much emphasis on *science* by the readers

themselves, although a great proportion of such stories contained little or no science at all (presumably referring to the two books he had just read) and, as with other eminent critics, he felt it was an unfortunate error that the *genre* was termed " science fiction " as ordinary readers are put off by the expression. He also felt that there was little satire or humour in science fiction although Mr. Crispin pointed out that American writers did use the medium to satirise their own way of life and mentioned the Pohl/Kornbluth book *The Space Merchants* as a good example of advertising taken to an illogical end. (He could perhaps have mentioned *The Big Ball Wax*, *Player Piano*, and *Greener Than You Think* as better examples).

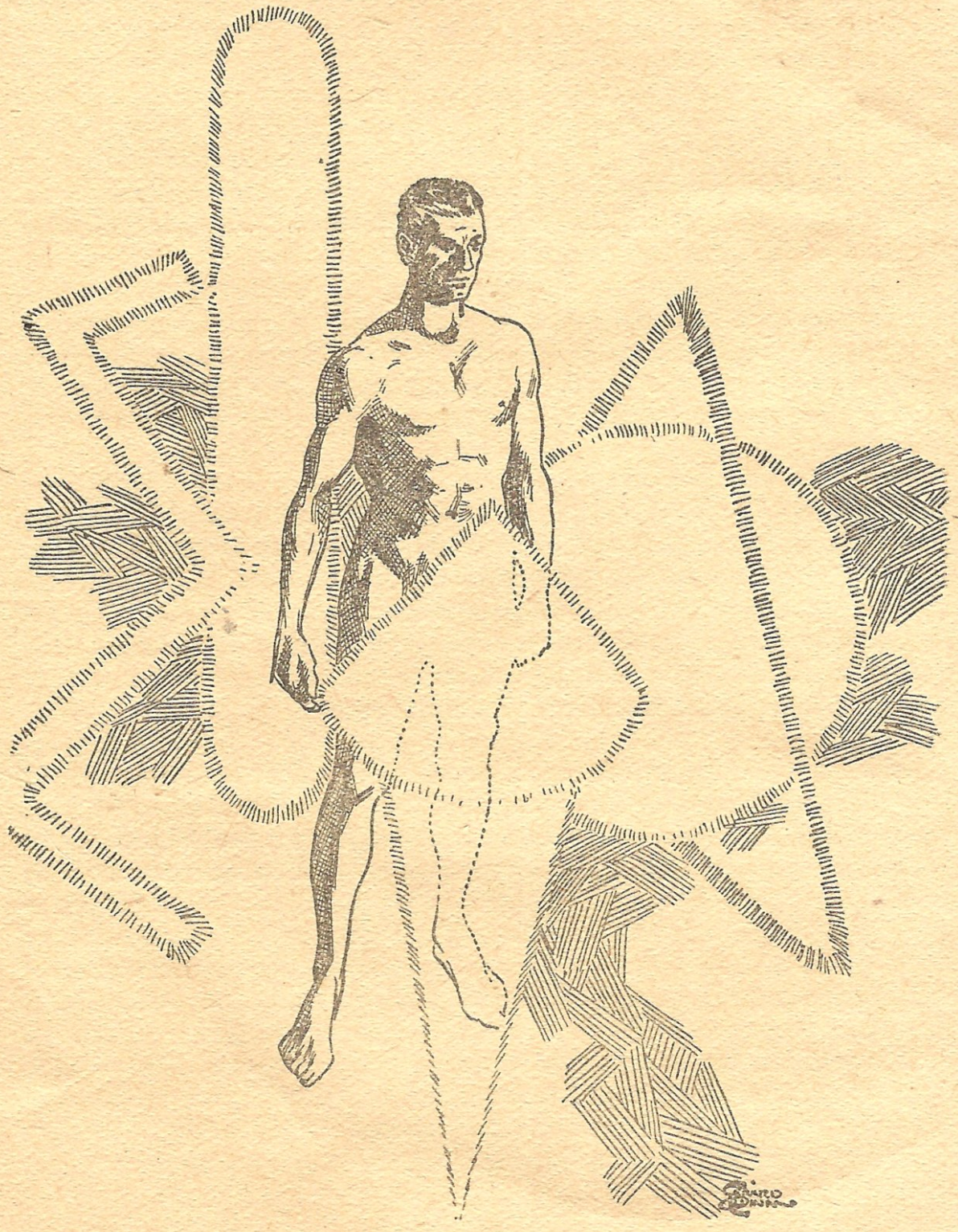
While admitting that he personally enjoyed science fiction stories although he had not as yet written any, Mr. Crispin thought that in many cases they took sin, vice, and political implication and showed them in their nastiness against a future possible background—what he didn't infer was that such stories point a moral to our present way of life.

By this time the coffin containing the body of science fiction was being lowered into the earth (which Mr. Priestley thought a much better medium for plot locale than the planets) and spiritual ashes were being cast over it. " In general," Mr. Priestley said, " science fiction is badly written, even in your (Crispin's) collection . . . it has a limited sale . . . people shrink instinctively from science fiction . . . it shows something is wrong with Man who is not (in the stories) moving forward and widening his consciousness."

While I have the greatest admiration for Mr. Priestley—his fantasy play " I Have Been Here Before " is one of my favourites—and have enjoyed Mr. Crispin's thrillers to the full, I do not feel that either of them were happy or at home with their subject, which consisted in the main of verbal sparring. Mr. Priestley would have done far better to have had someone with a wide reading range of both the American and British short story *and* novel fields and able to offer criticism and comparison with modern literature. In particular, novellist Miss Clemence Dane would have been an admirable choice, having collected, read and studied the *genre* for more than thirty years. Or possible Nigel Neale, author of the " Quatermass " duo, who gave the Science Fiction Luncheon Club address on January 31st, and quite frankly delivered one of the finest layman talks on the subject I have yet heard !

But personally, I wish the intellectuals would leave science fiction alone while there is still time to revive the corpse.

John Carnell.



HYPERANT

Telepathy and telekinesis will both be part of a hyperant's essential make-up—when and if Man ever attains that exalted station in the Cosmic scheme, but such powers will but be the beginning of things—for a hyperant can make or destroy matter, atom beyond atom.

By Francis G. Rayer

Illustrated by QUINN.

In V-formation over ten thousand miles of space the fleet drifted like silver ghosts behind the flagship *Tetracil.* Much, at least, was saved, Geoff Walney thought as he watched the tiny flecks of light on the screen.

"We have reached the calculated position, sir," the navigator's communicator said.

Geoff was silent, reminding himself that the *Tetracil* was no longer his to command while Flight Marshal Rosyth was aboard—which might well be indefinitely. At his back Rosyth was issuing crisp instructions. Geoff knew the ship was slowing to relative motionless, and that the ships of the fleet would settle into a saucer-shaped orbit round them. Three light years away a bright nova marked the back-drop of stars. Alpha Cleopa, once centre of the Seventh Galactic Empire.

" Too bad when a people have no planet, Captain Walney," Rosyth said quietly.

Geoff turned from the screen upon which the vessels were beginning to gain cartwheel formation. " An outpost must expect difficulty."

Rosyth's thick brows lifted towards his iron grey hair. " We have more than difficulty. We have danger. A people with no planet is like a sailor with no shore."

His brows came down and his face grew immobile as chiselled rock. Geoff admired his coolness while opposed by such disaster. The simile was apt. A sailor with no shore could not live: nor could the fleet with its thousands of men, women and children. There was a limit to food and to human endurance. Man needed space to move, fresh air to breathe, a sun in sky above his head—all the primitive essentials that had been the automatic right of his ancestors.

" You believe Alpha Cleopa was destroyed, as a habitable system, sir ?" Geoff asked.

" I am sure of it." Rosyth watched the screen over the shoulders of two seated subordinates. " Conditions were not those from which a nova would arise normally. That was checked before we settled the system's planet. If we are now adrift with no shore it is because that shore has been made impossible for us."

Geoff nodded, mind going back over the last weeks. The planet of Alpha Cleopa had resembled an Earth of which he had heard but never seen, thousands of light years away across the vastness between the stars. Into the peace had come sudden danger. The evacuation of the planet had been hasty and in some ways incomplete. The Flight Marshal's ship, immobile for repair, had been just one of the things left behind, and was by now undoubtedly a cinder with the rest. The Seventh Empire was now an empire in name only—a people, a drifting mass of ships. Until then, each empire had been a stepping-stone towards more expansion. Planets had been consolidated for a decade, a generation, then mankind had pressed on again and again. Easy success had brought expectation of endless expansion.

An hour later he went to his cabin, tiny and amidships. The *Tetracil* had settled into her position in the centre of the disk of vessels, each rotating to obtain a centrifugal substitute for gravity. He shaved, scanning himself critically. The Flight Marshal was intolerant of laxity. He would pass, he thought, brushing his sandy hair. Rosyth had snapped, " Untidiness suggests personal inefficiency, Captain ! Inefficiency may cause disaster !" No one invited such criticism twice.

He opened the door almost under a knuckle raised to knock. The young woman saluted, and he recognised her as from the astrogation section. At near twenty-four she had quickly expressive features and a height and build he personally liked. He paused, wiry hand on the door.

" You wanted me ?"

She nodded so that her dark, curly hair bobbed. He saw she carried a large folder, sought in his memory for her name, and found it.

" Very well." He let her pass and closed the door. " You realise I'm not commander here, Miss Austin."

Unity Austin smiled and he thought it conveyed much, particularly that junior astrogation personnel did not risk possible criticism by an officer sharp tongued as Rosyth.

" You can at least give your opinion, sir." The smile had gone. She opened the folder. " When leaving Cleopa we had automatic cameras gathering information for eventual study. Many other ships did also. It was a first close experience of a nova, and all knowledge eventually proves useful—"

She hesitated and he wondered to what she was leading. Certainly the astrogation section should have studied Alpha Cleopa during those fateful days. He nodded, sitting on the corner of the tiny desk.

Her eyes fell to the open folder. " No one bothered with these shots until a few hours ago. We've been too busy integrating courses."

He looked at the prints she shuffled out across the blue steel. Alpha Cleopa, normal, with swelling solar protuberances, and flashing into a dreadful, brilliant nova. From amid the sequences she was selecting some. He took one, studied it, and the breath hissed from between his lips.

Her gaze flicked up. " You see it ?"

" I see it." The steel was cold under his free hand. Dim, yet unmistakable on the graph-lined paper was a long, thin needle, glinting on its trajectory into the fierce, burning mists surrounding the star that had been their sun. Equally astonishing was the object's size, judging from the cross lines.

Her finger came upon the print. " And that ?"

Lost in the distance at the limit of the camera's reach was something dark and vaguely like a bell. Too remote for detail, its symmetry showed it to be no mere cloud of intergalactic gas thrown into relief by some trick of reflected light. Geoffrey would have staked his rank on it being no natural phenomenon.

She put other prints in his hands. The dark object drifted away into remote obscurity. The projectile, if projectile it was, sank into Alpha Cleopa's gleaming surface. The eruption into a nova was

distinctly pear-shaped in its early stage, with maximum increase in radiation coincident with the point of entry of the glinting object.

" Someone—something, blew up our sun to clear us out !" Geoff felt the shock unpleasant.

" You could put it that way, Captain."

" And you'd like me to tell our commander ?"

She inclined her head, placing the most telling pictures in one pocket of the file. " Now we're all in safe orbit the others will be catching up on routine work. There'll be other pictures. Some may be better."

She left him. He thought of the years during which their base on the system's only planet had been consolidated. It would appear that during that time there had been—other preparations. And of a singularly effective nature.

Rosyth's thick brows rose at first sight of the prints, and rested low over his light blue eyes when he had considered them all. He moved jerkily round the control room, and halted with thumbs in his breeches belt.

" They are undoubtedly artifacts, Captain !"

" I thought you'd agree."

" Which means man has at last met another intelligent race."

Without doubt, Geoff thought. Highly intelligent, and also highly dangerous and determined, at first showing.

Rosyth relaxed from his characteristic stance. " I'll want to see this girl who spotted it. Other ships may have better pictures. I'll need those too, and any information deduced."

Geoff nodded. " I understand from Miss Austin that astrogation may gain a little data from spectra tests."

Dimensions of the objects might also be calculated once the ship's computer had enough to work on. Those stages of the investigation would be in other hands, but he hesitated. Rosyth's gaze came keenly on his face.

" There is something else, Captain Walney ?"

" Yes, sir. Permission to leave the ship."

" Temporarily ? Of course." The Flight Marshal's eyes were quizzical. " I gather it's not—official business."

" No, sir, but being we're not on flight schedule—"

" Quite." The word was both permission and dismissal. " Keep in contact so that you can be recalled."

Geoff saluted, withdrawing. In a way Rosyth's presence was fortunate, he thought as he prepared to leave. It freed him from continuous duty.

The ferry tug slid into motion on murmuring jets. The *Tetracil* drifted away, huge, man-made and self-contained world. Or was she, Geoff wondered. Limitations seemed to spring into existence on every hand once such a thought arose. Each ship, with all her personnel, might live a mere decade, at the most, without touchdown. Compared with the millennia of the evolution and civilisation of man, how short was that period. A mere procrastination of the end, or foretaste of defeat.

Alpha Cleopa was a bright orb dominating the heavens. At three light years she should have appeared as nothing but a significant star. Near, Geoff was conscious that the multitude of ships of the fleet lay around him, dark but integrated by a matrix of radar. The knowledge brought comfort, dispelling some of the helpless feeling of personal insignificance.

He wondered if all these ships would have to return to the sixth empire outpost, receding through second-order space like whipped dogs. If so, it would be man's first retreat. Worse, it would invite speculation and advance on the part of the beings who had made the Alpha Cleopa system untenable. It was like a retreat move in a giant game of chess. Geoff started forward to catch his first glimpse of the *Greenbatt*. A retreat move. Barry Bell's keen grey eyes would have met his over the board. " Retreat wastes time, Geoff. The loss is twofold—that of the advance and the withdrawal. During that time an opponent can develop and consolidate—"

Geoff hoped that Barry would be free to see him.

A dim glimmer of reflected starlight dawned ahead, just visible through the ferry's nacelle. Geoff reported to the *Tetracil's* operator and drifted at falling speed towards the *Greenbatt's* lock, the ferry's forward tubes mirrored in her steel. He looked again at the stars around. Never before had man considered withdrawing from any of his stepping stones in space.

Barry toyed with a silver knight that had accompanied him through three galaxies and a hundred light years of space. " So you're still interested in Hyperants," he said.

" I've never ceased to be interested !" Geoff watched his friend's lean features, the play of feeling in his eyes, and the slight twitch of tension at his lips. " If there is such a thing !"

" There could be—in theory. And theory most generally leads to practice." Sensitive fingers replaced the silver knight. " Your interest isn't idle curiosity any more."

" No."

Barry Bell smiled, looking less than his thirty-five years. "So I guessed. Captain's don't leave their ships for nothing. And when permission of absence has to be asked from a man strict as Rosyth one can be sure the motive is strong."

"You guess right, as usual," Geoff admitted. "You know Alpha Cleopa probably didn't grow too hot for us by chance?"

"I guessed it. The probability of an apparently stable sun going that way during a man's lifetime is astronomically small, judging by data of habitable systems."

"As small, perhaps, as the existence of a Hyperant?" . .

Bell read his hands expressively. "That type of comparison can't be made. On the average, a nova arises in a certain fractional percentage of cases. A Hyperant, on the other hand, is a probable end result of a series. Looked at that way, you'll see the building of a space fleet was on the cards from the moment one of our ancestors found he could walk on his hind legs and carry a stone."

Geoff uncrossed his legs. Somewhere in the distance a bell had rung. "With no planet here we must go back to base six," he said flatly. "We dare not risk going on. The step from base six to a mythical base eight is too large. Rosyth would never permit it, and I agree."

The bell rang again, and footsteps sounded outside. Barry rose quickly and opened the door. A junior officer stood there, looking in.

"Captain Walney from the *Tetracil* here?"

"You're seeing him."

"Then there's a message he must report back at once." The man saluted.

Geoff gave an exclamation of annoyance. "Why?"

"The message didn't say, sir."

"Rosyth paging you before your chair is cold," Barry said as the man went. A low, unmelodious hooting began and his brows shot up. "Emergency! You'd better hurry."

Geoff took the ferry craft back rapidly. The only general alarm he could imagine was immediate standing-by of all personnel at flight stations. As no likely system existed near, that probably meant another period of recession through second-order space, or at least out of the continuum in which they had remained to watch developments in the condition of remote Alpha Cleopa.

Rosyth's apology was brief, his welcome to the point. "Long distance radar has located a ship not of our fleet, Captain. We're waiting developments."

The large screen showed a remote fleck that burned steadily against the glowing and fading at identification frequency of the other vessels.

Geoffrey noted its bearing was perhaps forty degrees off that of Alpha Cleopa. The interval on the screen of the distance-checking equipment showed it had ceased to approach. Thus it hung while the hours passed. Rosyth went off duty, and returned. A message came from astrogation, listing the calculated dimensions of the objects on the prints. Each was roughly fourfold the size of the *Tetracil*, largest ship of the fleet. Geoff felt increased unease at the knowledge.

When he went off duty after replacing Rosyth, the situation was unchanged. The cabin door next his was ajar. Wondering if something was amiss, he looked in. It was empty, tumbled bunk telling of an occupant not long gone. He began to draw shut the door, but hesitated, hand on the catch. Upon the steel locker fitting the wall near the bunk stood a globe in a triangular frame, unlike anything he had ever seen before.

He frowned, stepping in, curious yet with a sense of trespass. The globe was large as a clenched fist, silvery in colour, and its surrounding triangles of cherry red. The whole seemed devoid of useful purpose.

Steps came in the narrow corridor and he returned to the door. He recognised the newcomer as a junior officer from the propulsion section, fresh to the ship when she left Cleopa's planet so urgently, and presumably working duty hours which never coincided with his own. Perhaps twenty-five, he looked a mere youth. His slimness was almost extreme, his hair a light gold that might have been albino white.

"Nothing wrong, Lieutenant?"

Lieutenant Pakes shook his head. "No, sir." His gaze shot past Geoffrey, then returned. "Just slipped down to medical."

"Nothing serious?"

"No, sir." The other edged past him, halting with his back to the bunk. "Been having trouble sleeping, sir."

Geoffrey nodded, withdrawing. Pakes was not the only one who found present circumstances disturbing. He thought again of the globe in its odd frame, and put his head round the door.

"Tell me—"

He halted. The object had gone. The locker top was clear, its door closed.

"Yes, sir?"

Geoffrey felt beaten. "Report to go off duty if you need."

"Yes, sir."

Outside, Geoffrey frowned, entering his cabin. If Pakes wanted to conceal the globe, why not? Yet there had been no sound of the door. No time, in fact, for it to be opened and closed. After listening

to the silence of the waiting ship for long moments, he sat on the bunk. His own nerves were on edge, Geoffrey decided. If Barry carted chessmen about the galaxies why shouldn't Pakes have his own particular charm, oddity or memento ?

With the light dimmed Geoffrey settled down to sleep. His mind ran on Barry's words. Barry appeared to suggest a Hyperant would arise as inevitably as had a designer of space ships.

He awoke after an hour with a strange feeling of increased mental sensitivity. On the borderline of complete awareness a traffic of information was in some unknown manner taking place, filtering between other minds and observed by himself. One mind was that of a man; the other, something different from man. His eyes flicked open and his breathing momentarily halted.

A silvery globe enclosed in a red triangle stood on his locker, scant inches from his face. He snatched back his head and twisted on to his back, elbows digging into the bunk to rise. The oddity from Pakes's room ! He screwed shut his eyes, assuring himself he no longer slept. There had been no sound of entry; moreover, his door was fastened on the inside, as always. He swung his feet to the floor and opened his eyes. The object was gone.

He looked on the floor foolishly, searching though he knew he would not find. The globe was not in his cabin. Gone, too, was the awareness of mind contacting with mind.

He dressed quickly. The object had previously been in Pakes's cabin, and the logical move was to seek it there. Yet his assumption that it belonged to the thin lieutenant was now open to doubt, he realised. Pakes might be as ignorant of it as himself.

The cabin had no occupant, nor was there sign of the oddity once occupying his locker. Its top was covered with open books. One, inverted to keep the page, was titled *Whole Mind of Man.* Its author's name conveyed nothing to Geoffrey and he read the first page at the opened spot. " Matter and mind are relative. Matter cannot be proved to exist without the simultaneous existence of mind to apprehend it. If proof of the existence of matter depends on the existence of mind, then such proof exists, or does not exist, according to whether mind exists to apprehend it. In turn, it can thus only be deduced that matter exists, or does not exist, in accordance with the presence of mind to apprehend it, or the absence of mind to observe its existence. That matter still exists when no mind is present to observe it cannot be deduced."

Geoffrey returned the book. It was more in Barry's line, he thought. The others appeared to be much the same in subject, and he contemplated searching for Pakes. The search might not be easy—the *Tetracil*

was large, and a junior officer who could not sleep might legitimately wander down any of her hundred corridors and galleries.

Deciding rest impossible, he sought the control room. Rosyth was in a bitter humour, obviously irritated by the shadow sitting watch upon him. He scowled at the screen.

" It's been a one-sided affair, Captain Walney !" He jerked a finger at the motionless blip. " Their preparations show they've been aware of our presence in the system for years. Our awareness of their presence is a matter of hours only."

He grunted, the annoyance at being caught off guard twitching his lips. Geoffrey saw well over twelve hours had passed since his recall from the *Greenbatt*.

" We might try a continuum shift, sir."

" I'm thinking of just that. It means we shall not be able to observe further development of the nova, which astrogation wants. We're three light years out from her, remember."

He paced a few jerky steps, thumbs in belt, his light blue eyes flicking round the control room, but seldom long off the screen. He halted with equal abruptness.

" I've a feeling we don't know it all, Captain ! If we had suspected the presence of an alien race we should have tried to observe them, then contact them. If we felt uneasy, doubtful, the contact might be secret."

Geoff nodded, following. " You mean they may have secret contact with us—a spy—"

He realised the matter was growing more complex. It had begun as a mere hasty retreat from unendurable natural conditions, but fast increased to something much more. Rosyth might well be uneasy: there was cause in plenty. Geoffrey wondered if Pakes had a role in the affair, with his reticent manner and interest in odd sciences.

Rosyth studied the screen and the clock. He looked fully his years, and conscious of his responsibility.

" Order general preparation for a space shift," he said heavily.

Geoffrey watched Rosyth's officers and admitted they were as competent as his own. The quick *beep-beep* of the warning sounded through the ship, followed by check and counter-check from astrogation and radio. As each man gave his all clear tension grew, and Geoffrey felt the usual sickening lurch, a tearing of space and time itself, as the fleet shifted. The siren ceased its note, the strained features of the men relaxed, and all eyes returned to the screen. The fleet was unchanged, its identification echoes winking. The brightness of Alpha Cleopa was gone, would remain unseen for years, because the nova

was light years away in the continuum they now occupied with her. But the hovering alien blip was still there, its position unchanged.

" Damnation take us !" Rosyth said.

Geoff studied the watching shadow, and some primitive fear of the unknown momentarily awoke age-old reflexes in his nerves. An alien ship that could simultaneously occupy different space-continuui ? Or an immediate and simultaneous movement out of one space order to another, to keep observation on the fleet ? The former seemed impossible, the latter extremely improbable. *Unless there was a source of contact* !

He spun on a heel. " I want to find a junior officer named Pakes !"

The steel panel slid smoothly across at his back and he paused momentarily. If Pakes was the point of contact, he would have known a space shift was imminent, and might have conveyed the information. If so, the lieutenant had some explaining to do !

Within the hour Geoffrey felt a remarkable conviction growing. Pakes was not on the *Tetracil.* Impossible, yet being proved as the minutes passed. Medical had not seen him again, nor was he in any of the sections where a junior officer might normally reach or illegitimately penetrate. Some parts of the ship could only be reached by connecting doors always fastened or under guard. He had not passed. A general call for him over the ship's communication system failed, as did a quick but systematic search of the crew's cabins. Little by little Geoffrey was forced to admit that Pakes could not be found because of the fact he was not aboard.

He halted the search, dismissed those who had helped, and briefly reported to Rosyth. Rosyth sounded irascible. " Has the ferry been out or the main port opened since you saw him ?"

" No, sir."

" Then obviously he must be on the ship !"

Geoffrey felt the truth less simple. " He cannot be found," he pointed out guardedly.

" Then search again !" The tone suggested the whole affair was a mere unimportant irritation. " You don't need me to keep track of your men, do you, Captain ?"

Geoff let it pass. " I will have you informed if he is found, sir."

He flicked off the corridor communicator, frowning, and encountered clear eyes that looked mildly amused. The amusement seemed directed against him, but he felt no annoyance, but rather admiration for the direct gaze, smooth features and dark curly hair.

" The Flight Marshal is an excellent commander, even if a trifle crisp," he said wryly.

" So I heard."

He wondered what brought Unity Austin out towards the lock. Astrogation occupied a sector for'ad, where observation was best and interference from the ship's drive least.

" I'm crossing to the *Greenbatt*." She seemed to guess his thought. " They have some photocopies we want. They've radioed them, but we lose detail that way. We have permission."

Geoff's mind flicked over possibilities. This was a chance to see Barry Bell again—perhaps to continue from where the general alert had interrupted them. He felt he wanted Barry now, preferably on the *Tetracil*.

He pressed the communicator button again. " Captain Walney to Marshal Rosyth."

A moment's delay, then the clipped word: " Yes ?"

" I wish to cross to the *Greenbatt*, sir."

" Go if you consider the situation justifies it, Captain."

Good, Geoffrey thought. Rosyth was crisp, but gave his subordinates the advantage of trusting to their own judgement, knowing that freedom would not be abused.

Alpha Cleopa now appeared merely as a near star amid other stars, three light years distant, and thus seen as she had been those three years earlier. Geoff thought of the planet that was to have been the foundation of the Seventh Galactic Empire, and of the building, planning, cropping and tillage. Its virtual destruction had caused great material loss, but more bitter still was defeated expectation. Broken hope lay amid the ruined, smoking wilderness.

" What we need is a planet within fair distance," Unity said, gaze turned up through the ferry nacelle.

" There's no sun of suitable type in this sector of space."

" I know. Seems the Sixth Empire will have wanderers returning with a tale of defeat."

The ferry murmured on its course, an insignificant mote between slightly larger motes. For thousands of generations man's eyes had turned heavenwards, seeing worlds beyond worlds. For hundreds of generations his mind had looked forward to empires beyond empires. Spread and grow, build and settle. Then on again. Always on. Geoffrey breathed deeply. That was the essence of man. Always onward, always new shores to reach, new knowledge to gain. Each galaxy had been a stepping stone in his never-ending fording of the stars—until now.

The autopilot silenced the jets, and a gentle thrust began as their speed fell. Ahead loomed the *Greenbatt*, a dark mass obscuring the remote pin-pricks of light.

" No Sol-type star, thus no planet, thus no empire," Geoffrey said as they drifted into contact with the ship's lock. " An inevitable series."

She left him and he found that Barry Bell was probably in his own cabin. A ship-bound life could be boring for a man in Bell's position, he thought. No duties required attention, filling the hours. Laboratory, equipment, the very subjects on which a biochemist worked, all had been abandoned to the pyre reaching from Cleopa.

Bell was on his knees amid the greatest heap of books and papers Geoffrey had seen. His grey eyes showed surprise as they rose to the door. He wiped back the straggling hair from his brow and sat on his heels amid the debris.

" What brings you, Geoff ?"

" Our astro section wanted something. I took the opportunity."

Bell commenced placing books in piles. " An opportunity is one thing—the reason that prompts a person to take it, another."

Geoffrey sat on the corner of the bunk. " As you say. The reason? The disappearance of a lieutenant. The appearance and disappearance of something I can't name."

" As awkward as that ?" The other dumped books in his locker. " Disappearances seem catching." He gestured. " Books I have in plenty—but not the one I'm looking for—"

Geoffrey felt a tiny creeping motion somewhere in his skull. He licked his lips and found them dry. " Not a book you're looking for— ?"

" No," Bell stated. " The *Whole Mind of Man*. Something of a rarity, though that's not why I want it now."

The unease became stronger, almost a recoil of the mind from a belief it found untenable. Geoffrey felt his nerves twitch, and watched Barry stack away more books, momentarily stunned into silence.

" W-When did you have it last ?" The words came with difficulty.

Bell rose. " Not so long ago. Shortly after you left last time."

Geoffrey repeated the words. *After he had left*. Since then, no ferry craft had been to the *Tetracil*. Yet the book had been in Pakes's cabin !

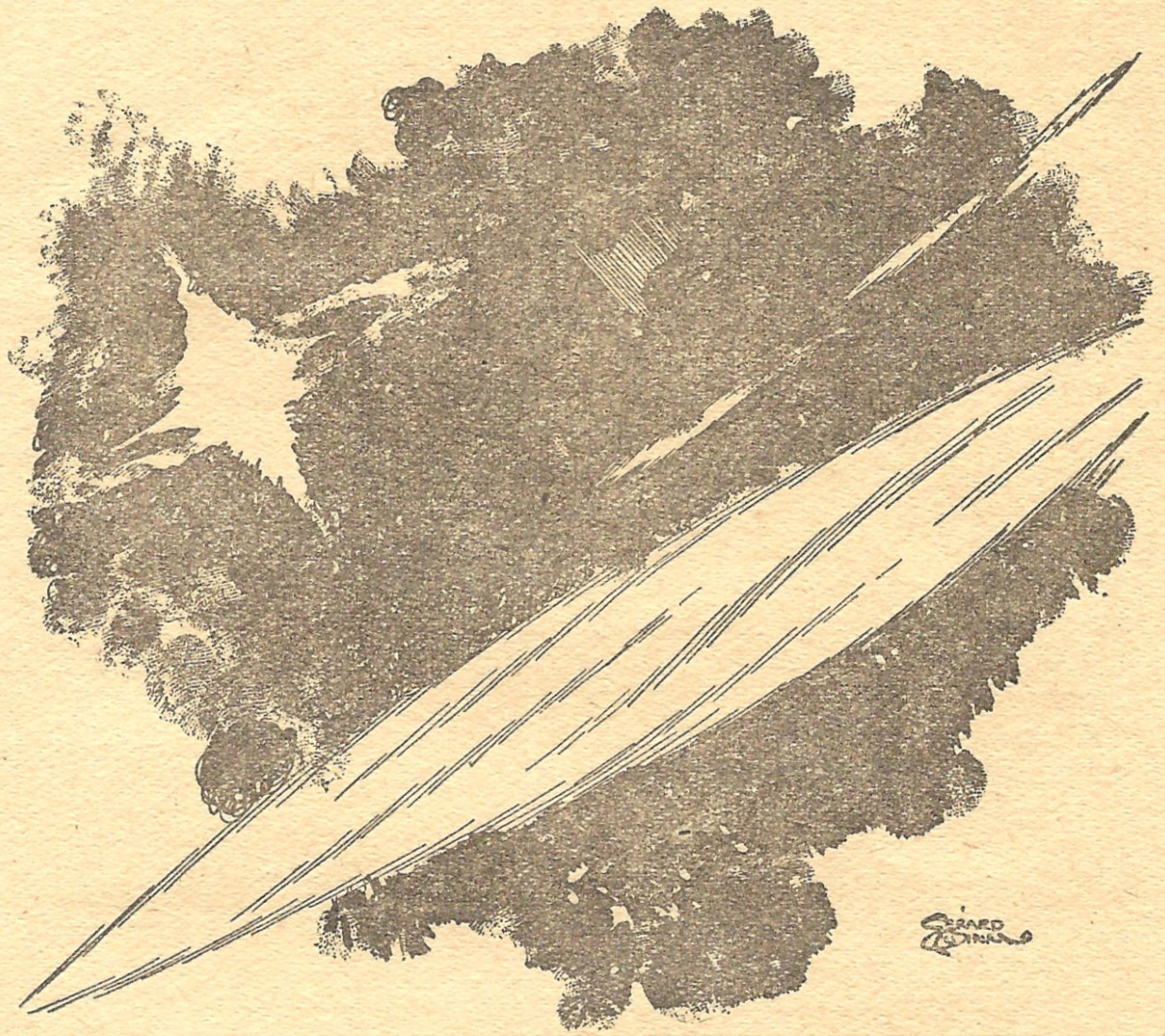
He saw that time flew, that explanations would be long. "Nothing ties you here, Barry ?"

" No." The grey eyes settled on him.

" Then I'd like you back on the *Tetracil* !" He knew there would be no argument, no preamble. Bell did not waste time or words.

" You think there's a good reason why I should come ?"

" I do !"



"When does the ferry go?" Bell was already putting oddments in a noose-mouthed holdall.

"Now. We've orders not to wait."

Barry led the way down the corridor, the bag over a shoulder. Geoffrey decided Unity Austin might already be waiting, and risked censure if the ferry was slow returning. The corridor ended at a right-angle passage, and some instinct prompted him to pause and look back.

At the other end of the corridor stood a thin, bird-boned man of perhaps twenty-five, watching them, hair white under the corner illuminant. Geoffrey's limbs froze.

"Pakes!"

If the other heard he made no sign. Instead, he stepped back quickly to the corner and was lost to view. Geoffrey flung himself into motion. His steps rang the fifteen paces of the corridor, and he gained the corner. Pakes was not in sight, but there were two open doors. The first led into a storeroom with no other exit, devoid of hiding place. As he ran through the second he almost collided with two men approaching in fitters' uniform. He stopped.

"Seen a man with light hair come this way?"

"No, sir." The first looked at him curiously. "No one came this way."

The second shook his head. "We just come down the gallery. Nobody passed us."

They stared at him and Geoffrey retreated through the door. The gallery beyond was long, and had no other corridors joining it. By no feat of speed could Pakes have escaped that way.

As he returned to the lock he wondered if he had been mistaken. The glimpse had been so brief. Yet Pakes was of a singular and distinctive leanness, and the albino white of his hair surely rare. All told, it could have been no other.

Unity Austin had two large, thick folders under one arm. "I've been waiting."

There was curiosity in her voice. Noticing it, Geoffrey decided explanations that in reality clarified nothing had better wait.

"Sorry."

The ferry left the dim outline ship behind and Geoffrey stared unseeingly through the plastic dome. Here indeed was something that as yet defied explanation. He only spoke once.

"If a Hyperant existed, what limitations would he have?"

Barry looked at him quickly. "Limitations? None, I think."

The tiny craft began to slow for contact. So far, one man had shown himself not bound by the limitations of ordinary matter, as imposed on humanity in general—Pakes. What one could accomplish, so could others, Geoffrey thought. The problem was knowing how. He wondered what Barry would do if they found that the hypothetical had indeed become fact. It would be a telling discovery, and its application as important as anything in history.

Contact with the ship came and he rose from his seat. He felt that the next few hours might prove a great deal.

After reporting to Rosyth, Geoffrey went to his cabin. Pakes was something of a mystery, but apparently did not wish to draw attention to his own activities. His rapid escape from observation on the *Greenbatt* proved that. Therefore Pakes might try to keep up the

impression that all was normal. Geoffrey decided as he walked quickly along the corridor. If so, Pakes would appear aboard the *Tetracil* by the time his duty period should begin.

Rosyth had had little to say, but had separated one ship from the fleet, detailing her to search. " We need a planet, Captain Walney," he had said. " The *Myridon* is the ship I think most suitable."

Geoffrey remembered her, and her skipper, Captain Abelard. The *Myridon* was relatively small, but the pride of Abelard, who would venture anywhere man and steel could go. Personally, he doubted if Abelard would find any sanctuary for the fleet. There was no Sol-type sun, and hence no possibility of an inhabitable planet.

He entered his cabin silently and closed the door. Moving without sound, he put an ear to the wall adjoining Pakes's room. Except for a low background murmur of engines, conducted by the chilly metal, all was quiet. He wondered if Pakes were there, or whether sound would betray him if he were.

After a few minutes he went out, taking the opportunity of listening at the door. All was still silent, and it was locked. He sought out the ship's warrant officer, checked Pakes's duty periods, and returned to his cabin. If Pakes was not back within the hour he would be officially absent, and liable to discipline.

Back in his cabin, he considered arranging some means of observing what took place in the adjoining room. It might prove worth while, he thought. There was a ventilation louvre near the ceiling, and it would be duplicated in Pakes's cabin. All were common to an extensive duct system, but a little work during the other's absence might make overhearing or observation possible that way.

Conscious of passing time, he waited. For Pakes it was soon—or never. Almost on the thought came the sound of the door opening. Instantly Geoffrey was at his own door, and emerging nonchalantly.

Pakes had just left his cabin. He appeared even thinner than usual, pale cheeked and ill. If he saw the adjoining door open he made no sign. An exclamation came involuntarily from Geoffrey's lips. Behind Pakes came four men, all from the cabin. One, lean and tall, he recognised as a senior ship's engineer. The others he did not know. They did not look at him, but the last closed the door and all followed Pakes along the corridor.

Geoff watched them go, forming a mental record of every movement. Their faces had been but fleetingly glimpsed, but he would know any of them again, his mental image remaining unfading as a photograph. He did not follow, deciding that if the five thought themselves observed their activities would increase in secrecy.

Little investigation proved necessary to find their names. The lean engineer he had recognised. The other three were from Rosyth's abandoned ship. Walcheri, a short, stout stores officer, and two crewmen, Erroll and Berno. He thanked the warrant officer, wondering what the four and Pakes had in common. ,

Rosyth had left his second officer on stand-by duty, and looked bleak as he emerged from the control room. Geoffrey saluted.

" You've had no report from Captain Abelard, sir ?"

" Nothing favourable. He points out the danger of going too far, so that we should lose contact with our sixth base. I personally doubt if the *Myridon* will find a useful system. Astro have studied our perimeter of the heavens pretty thoroughly. If we all return to base 6 that will be defeat—but if we lost contact with them, that would be disaster."

True enough, Geoffrey thought. With suns beyond suns, and galaxies beyond galaxies, it was possible to go so far that all old terms of reference became unintelligible. If a continuum shift took a man too far he had no bearing upon which to home. To go so far that there was no return was virtual suicide.

Barry was setting his possessions into some kind of order. Geoffrey wished a spare cabin could have been found nearer his own. His back to the closed door, he told of the four he had seen. Barry Bell looked pensive; the expression in his grey eyes was curious.

" Audley, Walcheri, Berno and Erroll," he murmured.

Geoff caught the tone. " You know them ?"

" Know of them, rather," Barry said. " They are names I've encountered before—among a list of others."

He searched quickly through the almost empty bag, took out a folder, and removed from it a single sheet bearing names written in his own hand. His finger ran down the list, halting momentarily at each of the four. Geoffrey's gaze flicked back to the top of the sheet. There was a single word. Astonished, he repeated it.

" *Pagans* ! "

Bell smiled slightly, putting the sheet away. " My personal evaluation ! Not very flattering, but rather apt. If you're as keen on old history as I am, you'll see the connection. It takes us right back to the first expansion of man from Earth. There were those who weren't in agreement. They said that if man expanded he might touch something bigger than himself, which could be the first step towards the end of our race. *Keep on Earth so as to keep Earth for man.* That was their slogan. Millions supported them, some in ignorance, many in fright. The first stages of that first expansion took a generation. It was slow—from Mars out, then to Alpha Centauri when the space

shift was devised. Time enough in plenty for feelings to grow, and a sect arose which called itself the Humanists, and said mankind was safest in his own little backwater." He sat on the edge of his bunk. "The sect was declared illegal. When the first expansion was accomplished and no terrible alien race came swooping back to Earth on our tails the scare died. There were insurrections, usually before each step out towards the stars."

Geoffrey thought of the monstrous solar bomb hurtling into Alpha Cleopa at fantastic speed. He wondered if the safety inherent in no expansion was at last demonstrated—too late. His high-cheeked face grew thin.

"And the Pagans, as you call them?"

Bell pushed shut his locker door with a foot. "The last of the old sect. Probably most of them don't know it even existed. But they have the same ideas. They think that if we expand indefinitely we'll meet something more clever than ourselves."

"And haven't we?" Geoffrey jerked.

"Perhaps. Perhaps not. Surprise counts for a lot." Barry Bell rose, stretching. "They're all underground now. I doubt if there are a hundred all told in the fleet, civilians included."

A hundred determined men might accomplish much, Geoffrey thought. Especially when circumstances abruptly seemed to prove them right! He saw his friend's taut brown cheeks twitch. Bell appeared to be following other possibilities.

"I'm wondering if Pakes is the first hyperant, Geoff," he said.

Geoffrey's mind flashed back to recent happenings, and the plan which had been formulating itself. "I can have him confined on a charge of leave without absence."

"It can be faked?"

"Easily, with Rosyth's permission."

Ten minutes later they were striding towards the stern sector where Pakes was on duty, the ship's chief N.C.O. at their heels. Pakes stood on a catwalk with a companion, looking down upon fuel-storage tanks in the gallery below. He started visibly at their arrival, pulled himself together with obvious difficulty, and saluted.

Geoffrey thought he looked ill. His lips twitched and his cheeks were pale, features telling rather of mental conflict than physical sickness. Geoffrey let his gaze bore into him without mercy.

"You are to accompany us, Lieutenant." He let the words sink in. "Absence without leave remains a severe matter."

Disbelief, consternation, crossed the thin face. "I—I have not been absent, sir—"

Geoffrey calculated the hour at which he could have sworn he had seen the other on the *Greenbatt*. "You were absent at 1700 hours."

The consternation became dismay. "I was not listed for duty at that time, sir."

"But was required for it, nevertheless," Geoffrey lied. "You were wanted for special duty, but could not be found."

At his gesture the N.C.O. stepped smartly forward. Pakes seemed about to argue or resist, but subsided into silence. Geoffrey's lips opened from a thin, compressed line.

"You are under arrest and will be confined pending investigation, Lieutenant!"

Pakes's face had resumed its wooden immobility. Once again it was clear he would give nothing away, His lips barely parted.

"Yes, sir."

"Absence during a critical time such as the present is grave."

"Yes, sir."

"Marshal Rosyth himself takes a severe view of your action." Geoffrey tried to make the pressure mount, looking for some sign of emotion that might reveal Pakes's thoughts. There was none. Pakes's lips moved as if a dummy spoke.

"Yes, sir."

Geoffrey knew he was beaten—for the moment. "Take him away, sergeant!"

The N.C.O.'s iron fingers closed round Pakes's thin arm. Barry Bell moved from the corridor wall, momentarily facing the Lieutenant.

"Witch hunts last, Pakes."

Geoffrey saw that the thrust had struck where his own efforts had failed. The mask was gone momentarily, leaving naked, unconcealed terror. Then it returned, wooden, with expressionless eyes. With the sergeant-major at his side, Pakes marched from sight. Geoffrey expelled his breath. That brief moment had proved there was more in it than a mere supposed breach of discipline!

"I guarantee Pakes knows as much about the Pagans as any man!" Bell stated as they left the catwalk. "If ever I saw fright it was then."

"We'll leave him a little while—to think!" Geoffrey hoped that introspection would soften resistance. If not, Pakes must be encouraged to talk, even if the encouragement were a trifle rought. Time to think, in solitude in a steel cell, should help.

As they reached the first junction the *beep-beep* of the warning system echoed along the passages. Geoffrey broke into a quick trot. A general alarm meant he should be in the control room.

Rosyth was already there, gaze bent on the screen in complete concentration. Only by a slight movement of a hand did he acknowledge Geoffrey's presence, directing his attention at the radarscope view.

The dark mass of the alien ship hung in the same position, but rhythmic movements in the outline showed some activity had commenced. As seen by the radar, the movement was incomprehensible, a mere swelling and retraction of one flank of the perimeter of the distant ship. Almost a pulsation, it came and went without change of tempo.

" Make anything of it, Captain ?" Rosyth did not look away.

Geoffrey watched the rise and fall of the bell-shaped outline. It could be a distortion of the radar reflections by some local equipment in the alien hull. " Difficult to see, sir. Can we have more magnification ?"

The operator shook his head with a quick jerk. " It's at maximum, Captain."

The pulsation continued, half lost beyond the sparking of intergalactic static. Shimmering waves of silvery haze crossed the screen, the remote ship wavering as if seen through heat.

" The outer ships have triangulated bearings," Rosyth stated, voice clipped. " The figures give our enemy a likely distance of about thirty thousand miles."

Beyond the limit at which the radarscope could give exact information, Geoffrey thought. The captain of the waiting ship—if captain it had—might almost have been aware of the limitation of their equipment.

" I think something is—being *separated*, sir !" the operator murmured uneasily.

The pulsation looked greater. At times the protuberance was almost disconnected from the ship. Beyond the haze the flickering outline clarified momentarily, and Geoffrey saw a long, needle-shaped body detaching itself from its parent outline. In a flash it recalled the photographs taken by astrogation. The shock of recognition ran through him like a physical current.

" A missile !"

Rosyth had seen it too, and was already talking quickly into the inter-ship radio.

" All vessels prepare for continuum shift. If emergency arises and communications are broken, act under your own initiative. If dispersed, wait in Alpha Cleopa nova continuum if possible, for radio contact."

Geoffrey wished the fleet were armed for war. But the ships were not. Mankind had not wanted to expand by conquest, but by occupy-

ing unwanted living space. He doubted if any weapons they might have possessed would have halted, turned or destroyed the projectile, if it resembled that which had swept into Alpha Cleopa. It was now distinctly separate, and approaching with astonishing velocity.

A communicator near the door shrilled, and Geoffrey jerked down its switch. "Captain Walney, control room!"

"This is Bell. Pakes has gone!"

"Gone!" Astonishment momentarily thrust their greater danger from Geoffrey's mind. "He was to be locked in a cell—"

"And was!" Barry Bell rapped. "There's no way out, and the door was still locked!"

"Thanks!"

Geoffrey jerked up the switch. Rosyth would not welcome interruptions of this nature at the present. His eyes flashed to the screen. The projectile was now distinctly visible, needle-shaped, moving straight as an arrow towards the heart of the fleet. Remembering Cleopa, he doubted if their dispersal was sufficient to save even half the fleet. Radar was now giving direct distance readings with monotonous regularity. Twenty-thousand miles, fifteen . . .

"All ships prepare for space shift!" Rosyth snapped.

With a sickening feeling Geoffrey remembered that the previous space shift had left the alien ship hovering unchanged. It could happen again—

The sickening lurch almost simultaneous with Rosyth's order; the quiver of steel and flesh, as if dragged through some warp of time and space . . . Alpha Cleopa blazed as a nova. A score of ships, slow to act, vanished from the general screen, then returned. "Ten thousand miles," the radar man stated.

Rosyth swore into the silence following the hiss of expelled breath. The bell-shaped shadow still sat on the edge of visibility. The needle shone, growing.

"Seven thousand."

Rosyth's voice came, sharp as ringing steel. "All ships maximum acceleration radially!"

Within seconds thrust shook the *Tetracil* and the flecks on the screen began to spread with infinite slowness. Looking from them to the screen upon which the missile loomed, Geoffrey knew it was too late. Mere seconds remained. Minutes would have saved them. But Rosyth, relying on a space shift, had left it too late.

"Three thousand," radar said.

He wondered at what point the missile would detonate. The ship's first-order drive had scarcely put them up to half-G acceleration, and the others would fare as badly. A hundred miles or so either way

would probably make little difference to a weapon able to disrupt a solar body . . .

"Two thousand." There was a crack in radar's voice.

Then a mass like a clenched fist loomed from nowhere. Dark, featureless, mere matter, distant beyond the perimeter of ships, it obscured the radarscope view and the pinpricks of distant stars. Geoffrey gaped, shock twanging his nerves. Large as a minor planet, formless, irregular world that was no world made by nature, the mass hung in the missile's path. For the space of an inheld breath the dark body hung, then brilliant fire was born behind it, lancing out in a holocaust of blue flame that hurt the eyes, flowed over a thousand miles radius, and faded. The dark body ceased to exist. Gone, too, was the needle, consumed to its last atom by some wholesale fission at which he could not guess.

He wiped his brow and found his hand damp. The radarman was shaking visibly. Systematically, in a voice that barely trembled, Rosyth began checking his ships' positions.

Geoffrey left the control room, walking stiffly, his face set like white marble. Did he live to be a thousand the abrupt appearance of that dark mass, so like a clenched fist, would remain vividly in memory. Only as in a dream did he hear Rosyth's voice checking off his unharmed vessels, and instructions for one to contact Abelard in the *Myridon*, informing him of the fleet's space shift.

Barry was waiting outside the cell. Door open, it obviously had no other possible means of egress. The door itself was unmarked, equipped with an external fastening.

"It was still locked," Bell said.

Geoffrey examined the smooth, uninterrupted steel. From inside there was no catch or lock to pick. He straightened. "Someone could have opened it— ?"

"One of the four ?" Barry Bell shook his head. "There was a guard, and the N.C.O. had the key."

So again they must search for the elusive Pakes, Geoffrey thought. They left the cell and he looked sideways at his friend.

"You know what happened just now ?"

"I didn't see it, but heard enough to explain—if explanation it is." Barry put his hands in the pockets of his loose jacket, walking with his head bowed. "You realise there's only one solution ?"

Geoffrey had expected it. "Pakes is a—hyperant."

Barry's silence he interrupted as agreement. He recalled the scores of times they had discussed the subject, slowly penetrating more deeply into the theory. Even with all implications realised, the prac-

tical demonstration of that theory had been shattering. He remembered the time he had asked what limitations a hyperant would have, and Barry had replied, " None !"

He halted at the corridor end. " Pakes has given himself away. Concealment is over—"

" Because self-preservation is the stronger instinct," Barry Bell interjected. " That missile posed the biggest problem Pakes has encountered. Let it do its work, or act himself, knowing he could then pretend no more ? He chose the latter."

Geoffrey thought of the phrases he had read in the *Whole Mind of Man*. Pakes's knowledge clearly extended beyond that of Barry, being limited to no mere theory.

He turned the junction corner and halted. Pitifully thin, a mere dummy deprived of rigidity, Pakes was collapsed almost at his feet. His eyes were closed, his face white, and he was half propped against the steel wall, as if he had tried to rise and failed.

Geoffrey knelt quickly. The pulse still beat, weak and quick. He turned the crumpled form to a sitting position.

" Get someone from medical, Barry !"

Barry disappeared, and almost within moments footsteps rang along the corridor in return. Pakes hadn't been strong enough to take it, Geoffrey thought as he watched the brief examination. The medico rose from one knee.

" General collapse, so far as I can see, Captain," he said. " He's a bed case."

Geoffrey noted curiosity in the voice. " See to it, will you."

" At once." A pause, then: " I understood he had been confined for absence, and was going to see him. His nerves have been in poor state."

The man's eyes put a clear question. Geoffrey nodded almost imperceptibly. " He had been absent, but we released him, seeing his offence was an error, not insubordination."

He could not be sure whether the lie had passed. A second man appeared with a light stretcher and Pakes was borne away. Geoffrey watched him go, wondering what knowledge was hidden by the bloodless, silent lips. Certainly something as startlingly new to civilised humanity as the first leaping crackle of fire had been to remote ancestors.

They followed and waited outside the hospital ward. The delay grew and Barry Bell moved uneasily.

" Suppose we look through Pakes's things, then come back ?"

" A good plan."

The time for conventional respect for a fellow's privacy was gone, Geoffrey thought as they hurried back towards the cabin near his own. It was untidy, but the disorder was rather that of extreme activity and pressure, not the mere muddle of laziness. The bunk was unmade, papers stacked at its foot. With a murmur of triumph Barry lifted them, withdrawing a book with a distinctive cover Geoffrey recognised. Barry flipped through the pages, halting. Whole passages had been marked. Elsewhere, occasional lines had been underscored. Bell put a finger on the open page.

" For the observer, knowledge that a thing exists means that the state where it may have influence on him is reached," he read. " The object that has become subject of his observation has not changed, but its effective relationship to himself has. Not knowing of its existence, his conduct is such as would arise if it did not exist. Knowing of its existence, his conduct is changed to accommodate this knowledge. The change to the observer may be great; yet no change has arisen in the object—"

" Heavy going," Geoffrey said.

Barry nodded. " Look."

In the margin Pakes had scribbled: " First step, important to remember."

The passage was undeniable in its truth, Geoffrey thought. A man could picnic in tranquility on an unexploded land-mine—until he knew the mine was there ! For the man, knowledge that the mine existed equalled a coming into existence of the mine under his feet. A person could not react to circumstances if he did not know they existed.

" Listen to this, he underlined it," Barry said. " *The foregoing chapters suggest the effective presence of a thing depends upon knowledge of that presence. Without knowledge, effect is absent. Knowledge thus creates.*"

Geoffrey stared at the crumpled page. Pakes had drawn two thick lines under those last words. *Knowledge thus creates.* He sucked his lower lip, pondering. Apparently disassociated facts were beginning to integrate in his mind, and the pattern they made was of such intricate complexity that his brain crept, shivering as with a physical movement inside his skull. Barry Bell closed the *Whole Mind of Man* with a snap, and Geoffrey saw that his fingers shook visibly. The grey eyes held an odd expression; the cheeks twitched momentarily.

" Pakes has been into this pretty deep," Bell said.

Geoffrey's gaze was on the closed book. " You've found your hyperant—and had proof theory can find expression in practice—"

" It always can, when based on fact." Bell looked from the cabin door, as if for the first time realising others might be listening. "Newton,

Franklin and Edison didn't invent electricity. They showed it existed and could be applied. Pakes is their equivalent in this, and sets my own dabbling on a level with the efforts of a chinaman rubbing amber."

"Let's go back to the ward." Geoffrey moved to the door. The great, fist-shaped mass of inert matter against which the alien missile had hammered itself to destruction hinted at the complete overwhelming power of mind. But between theory and practice lay knowledge of practical technique—information Pakes alone had.

"Intermediate steps unknown to us may have helped Pakes," Bell said as they approached the ward.

Geoffrey wondered silently what they might have been.

Pakes lay motionless except for a ceaseless flutter of his lips, barely visible, so slight was it. Geoffrey stood at the bunk-side watching him, then raised his eyes to the medico, who shook his head.

"He's in a bad way."

"There's no actual physical injury?"

"None, Captain. But profound collapse and shock. He has suffered a nervous or mental *impact*—"

The words invited comment but Geoffrey made none. "He'll be unconscious for some time?"

"A long time." The doctor's eyes sank momentarily to the thin face. "A very long time—possibly days—possibly—"

The words trailed off again, startling Geoffrey by their soberness. "You think he may—die?"

"It is possible."

Barry's hand came upon his arm, and Geoffrey knew what the grip meant. If Pakes died, with all his knowledge . . . ? What if the cavemen who had discovered fire had perished, taking his knowledge with him?

"You'll do everything possible?" he urged.

"Of course, Captain."

Pakes's cold lips fluttered again. Bending, Geoffrey thought he caught a phrase: "I tried—" The set expression on the thin face could have been mental agony, reproach. On impulse Geoffrey put his lips almost at Pakes's ear. "*You succeeded*!"

No movement, no other word. Rising, Geoffrey found the medico's gaze on him. He left the bedside.

"I want an N.C.O. on duty here until he recovers—or until—" He left the words unsaid. "I want an exact record of all he says, if he speaks. No, better have a tape machine to take it down. There may be things a stenographer might miss or not understand."

"That will be in order, Captain Walney."

Geoffrey halted smartly at the door. " If there is any change in his condition I wish to know at once."

No more could be done, he decided as he left. Within minutes anything Pakes said would be going on record, and could be studied. They could only wait, and hope he would recover.

Alone, he returned to the control room. The alien ship still hung on the limit of radar visibility, but seemed to be moving slowly upon a tangent to the hub of earth ships. A waiting silence had descended on the officers.

" I've had a ship through and contact the *Myridon*," Rosyth said crisply. " Abelard's reports are the same—no sol-type sun, hence no possible planet."

" And what of them ?" Geoffrey indicated the shadow on the screen.

" I don't feel they'll try anything further for now. The last—*failure* was complete."

Rosyth's tone said certain explanations were lacking. A deserted lump of rock did not materialise from nowhere without reason, or so conveniently halt a missile by chance.

" As you say sir, it was." Geoffrey felt the legitimacy of Rosyth's curiosity must be acknowledged. " I hope Mr. Bell and myself may have something useful to say on that eventually."

A quick flash from light blue eyes told him Rosyth would not press the question yet. Intermediate steps by subordinates were not the Flight Marshal's concern. Geoffrey felt glad to leave it thus.

He looked in on the sick ward, and found a tape recorder set up by Pakes's bed, wired to a suspended microphone and already running. The patient's condition appeared unchanged, though Geoffrey wondered if his breathing were not a trifle more irregular.

In many ways Rosyth's presence was fortunate, he thought. It gave a freedom which no ship's captain could otherwise have had ! He checked that watch would be kept on Pakes, then turned his feet towards corridors they rarely trod.

A tiny lift in a cylindrical shaft carried him up through the ship, halting at the limit of its travel for'ad. He stepped into a passage where the murmur of the vessel's power equipment scarcely penetrated, and went through into the nose, where astrogation officers sat at their equipment. Under the transparent dome he had a feeling of being infinitely small, yet it was a relief to see outside the confines of close steel walls. Stars marked the sky in un-named groupings, wheeling slowly as the hub of ships rotated to simulate gravity. The many ships, dotted in unchanging formation, could not be seen. Instead was apparent isolation beneath majestic constellations earlier

men had never seen. Alpha Cleopa in her nova glory dominated the heavens, visible again without time lag since the return continuum shift.

He moved quietly round the astrogation room. Precision instruments were still adding to the data covering Cleopa and the surrounding galaxies, plotting, measuring and co-ordinating. A further door opened and a girl of medium height, with dark, curly hair, came through. Geoffrey felt satisfaction, doubly strong when he saw pleasure cross the mobile features.

" Captain Walney !"

" Yes—but not present on duty, Miss Austin."

" Nor for idle curiosity ?" she asked quickly.

He smiled slightly. " No. I'd like another look at the ship and missile photographs—to begin with."

She motioned to a vertical projection unit fitted in a corner. " We've a composite movie of the best shots."

He watched while she ran the machine, muscles unconsciously tensing as the climax came. Ship and missile were huge; the eruption of Cleopa inspiring of awe and astonishment. He halted the girl at the moment when the silvery needle was most clear.

" It resembles the second one," she murmured.

Geoffrey felt his brow rise under his sandy forelock. Unity Austin missed little ! " It does. Anyone taking observations when the second blew up ?"

" The automatic machines were on."

She left the projector. From her tone Geoff knew she would have liked to express a different opinion, or contradict him direct. The missile had not blown up: it had struck some enormous body in its path.

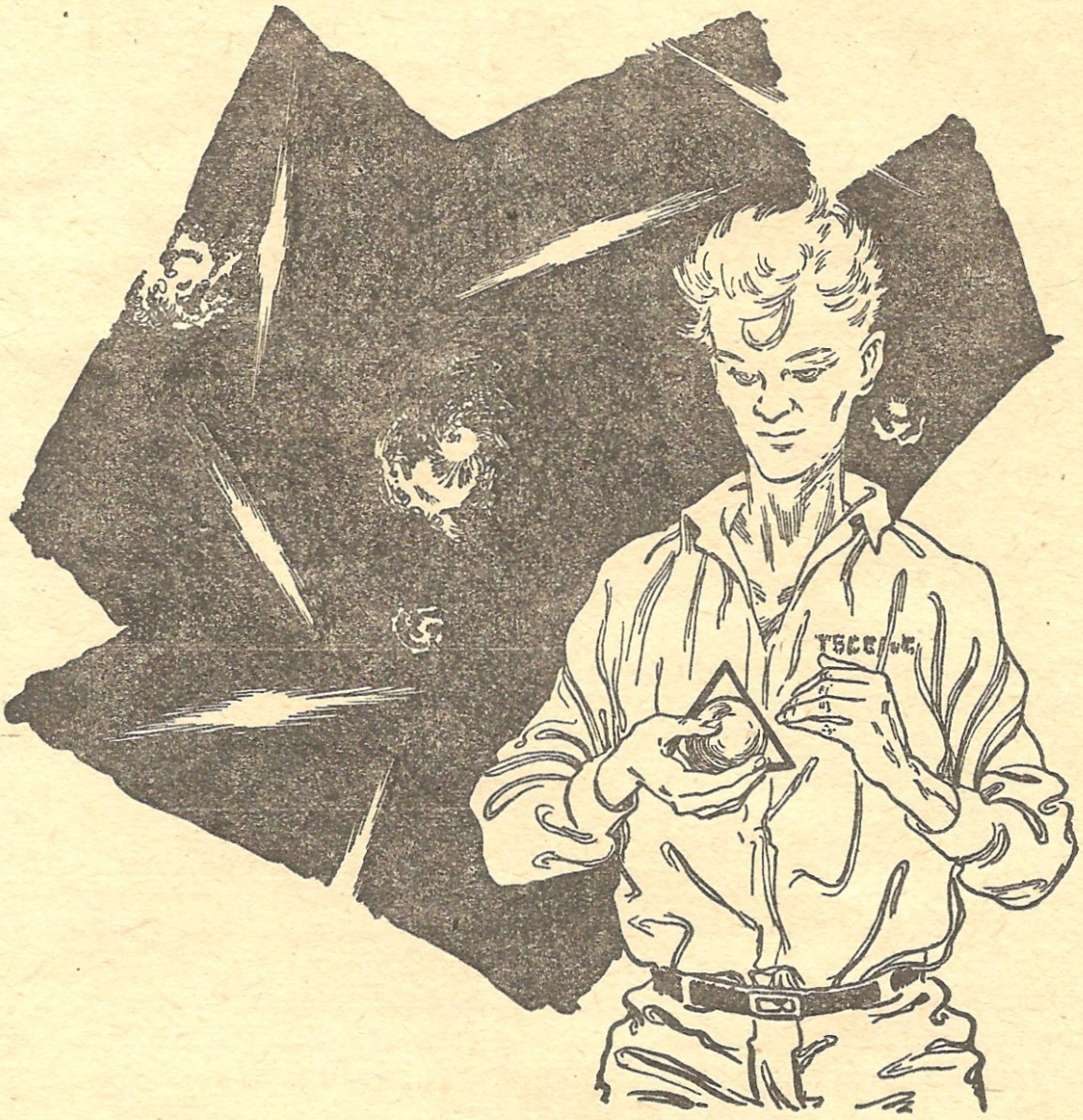
He was still studying the motion pictures, running the projector back, when she returned. " There's not much data on the second missile, sir."

He thought the title of deference singularly unsuitable on her lips. But correction of such points would have to wait, he decided. Rosyth was a veritable fiend for discipline. There were other considerations, too . . .

" Yes ?"

She put a sheet in his hand. " It's velocity was computed by triangulation from ships on the perimeter. So was the radiation shock wave."

He studied the figures. They were highly impressive, even by interplanetary travel standards. The missile had had such velocity that no major weapon could have been prepared in time. As bad as looking for a plate to catch a bullet when someone shot at you, he



thought. The energy released was equally astonishing. A note said it apparently represented the complete fission of the whole missile, including hull and propulsion equipment. He chewed a lip. If so, then the weapon had been the most completely efficient he had yet encountered.

"I understand there was something else, sir."

He looked at her quickly. Her eyes did not hold the expression a junior should have for Captain, but he felt no annoyance at the fact. "Yes, Miss Austin?"

"A movement of the gravity meters shortly before the detonation. We thought it a fault in the equipment, but other ships have since reported the same effect. It was as if— as if—" She sought words.

" As if a large body had suddenly appeared, then been destroyed. Its attraction was shown by the equipment for seconds only."

" Very likely," he said.

He knew that here again was not the time for explanations. Anything he might say would be only half intelligible, because so far only half sense to himself. When he began thinking, trying to put it into such phrases as he might employ with Rosyth, his brain began to wriggle and squirm, refusing to be forced into the task.

He saw a question fluttering on her lips, manifest in her direct gaze, and felt thankfulness when the ship's general communication unit on the wall awoke.

" Captain Walney—"

He crossed in two quick steps. " In astrogation and speaking."

" Good, I'd been looking for you !" Barry Bell's voice. " I'd like you down at once."

" Why ?" Geoffrey felt uneasy at the tone of urgency.

" Someone's stolen Pakes's tape."

The reproducer became silent. A shock ran through Geoffrey. Barry knew nothing further need be said, and did not err. Pakes's tape ! The tape from the recording machine at his bunk-side . . . ! Geoffrey was at the exit door even as the full meaning of the loss swept into his mind.

Barry swore. A hard glint in his eyes boded violent catastrophe for someone unknown. His finger accused the tape-machine again.

" Gone !" he said. " Gone damn it."

Geoffrey moved round the bunk. Both winding spindles were empty, new and used tape and both spools gone wholesale. The officer left to watch sat on the next empty bunk, still nursing his head.

" You saw no one ?" Geoffrey snapped.

" No, sir, as I said." The man looked up, tenderly touching the lump. " The blow was from behind."

" Had Pakes talked ?"

" Yes, sir. Quite a lot. In delirium, I think."

" Do you remember what he said ?"

The man moved uncomfortably. " Very little, sir. It—it didn't appear to make sense. And I knew it was going on the tape."

Geoffrey crushed the desire to make a victim of someone. The man was right. It was going on the tape—and would not seem to make sense ! Selective reasoning like the *Whole Mind of Man* did not make easy listening, and Pakes had gone beyond that.

He became aware that Pakes himself was breathing unevenly, and that a blue tint lay on his cold lips. When they left the ward his con-

dition had not improved. The medico met Geoffrey's eyes as he went out, and shook his head very slowly.

" What now ?" Barry asked.

Geoffrey chose the way towards his cabin. " I don't like the look of Pakes, poor chap. He's been ill for months—he's no constitution."

He wondered where on the *Tetracil* the spools were now concealed, and by whom. A detailed search of a ship so large would take weeks, with no guarantee of success. During those weeks forces other than those of law and order could be preparing for action.

An hour later a messenger tapped on his door. Geoffrey opened it and recognised a man from the medical section, and his face showed the news he brought was no pleasure.

" Lieutenant Pakes has died, sir."

Geoffrey felt regret at the loss of a fellow, and dismay at the implication of that loss. " Did he speak again ?"

" No, sir. The coma that followed his delirium never lifted."

" I see." Silent and thoughtful, he watched the man go. The tape was now vital, last possible means of discovering what the thin lieutenant had known.

He recalled the four who had left Pakes's cabin, whose faces he remembered, and whose names he had discovered. Audley, the lean senior engineer, Walcheri, the plump stores officer, and the two crewmen, Berno and Erroll. It seemed likely they would have watched Pakes, seen developments, and surprised the unsuspecting N.C.O. The moment for them to be taken unawares in their turn had come, he resolved.

He went to the stores section of the ship, huge because of the vast demands made upon it. Food, medical supplies, instruments, spares and replacements of every kind filled a whole level in the vessel, secured in systematic blocks with narrow alleys between. Walcheri stood in a tiny office cubicle whose three walls were occupied by racks of reference files. He saluted, but Geoffrey did not wholly like the expression in his dark, rather near-set eyes.

" I wish to see files M, N and O," he said.

Walcheri slid folders from their places and turned down a flap to serve as table. Geoffrey wondered if he would guess that two files were merely to allay suspicion. M was the file he needed—*Machines : tape; for the playing of.*

The other placed the folders on the table. " You wish to check some particular store issue, sir ?"

His voice indicated only a natural curiosity and proper desire to help. Geoff shook his head.

"No, merely assure you're up to date. Marshal Rosyth may be along."

He felt the lie and explanation most convincing if left at that and leisurely studied the records. Some items of equipment were extremely valuable; others were important; many were irreplaceable. Everything had to be signed for, and checked off, if brought back. That fact had prompted his idea. No person on the ship would have a tape machine unless it had come from the store.

The N file was on top, and he spent many minutes looking through it. Walcheri stood with one elbow on the extended flap, flanked and backed by files so that he could move but little, and Geoffrey felt the dark eyes following every page. At last he closed the N file and took up that marked M.

"Fault can scarcely be found with your records."

"Thank you, sir."

Geoffrey let the pages flip rapidly through his fingers. *Macaroni. Machines.* He could not be sure if Walcheri's breathing had hastened. There were series of sub-listings, with stores position numbers. *Tachometer. Machines, tampion, for the removal of. Machines, tape, for the playing of.* The leaf passed over with the rest and he read two names, entered in Walcheri's neat hand. One was from the medical ward. The other was S. Audley. He went on with unvarying speed, resolutely to *Muzzle, canis, for the gagging of*, and gave the last file equal attention. He closed it with a snap.

"I don't think Marshal Rosyth would have any fault to find."

Walcheri returned the folders. "You want others, sir?"

"I don't think so."

Geoffrey walked round some of the piled stores, viewing them with apparent interest, and sought the door. In opening it he allowed himself to look back. Walcheri had folded away the table and stood before his cubicle, watching him go. The door closed, Geoffrey hastened. It would prove interesting to find why S. Audley, senior engineer, had suddenly required a tape machine, he told himself.

The engineer was off duty and not required to return for some hours. His cabin seemed the best place to try. Nowhere else could Audley find privacy.

The door was closed. From beyond it came a weak, irregular flutter of speech. Geoffrey took his ear from the cold steel and looked both ways. The passage was empty; he tapped, waited, and tapped again, knowing what he would find.

Audley, tall and with thin lips, started visibly, saluted, and stood so as to block the door.

"You wish me on duty, Captain?"

His voice had a hard ring. Here was no second Pakes, Geoffrey thought. Instead of replying he moved forward, so that Audley could only prevent his entry by actual physical opposition. Almost brushing shoulders, both stood in the room. Behind Audley a tape machine stood on the locker, spools halted but indicator alive. Geoffrey closed the door at his own back.

" A tape has been missed, Mr. Audley. May I hear yours ?"

Furious eyes locked with his own, and Geoffrey knew he had found Pakes's recording. The engineer did not move.

" My own choice in—entertainment is my affair, Captain."

" Undoubtedly." Geoffrey reached out a long arm, put an extended finger on the start button, and the spools moved into action. For a bare second Pakes's voice filled the room, then Audley struck down the stop button.

" An unusual recording," Geoffrey said, reaching back behind him for the door. " A little less confidence might have saved you—"

The door moved violently against his hand. Arms locked round him from behind and something extremely hard pressed into his back. A third hand stifled his shout. A blanket whisked from the bunk over his head. Geoffrey swore within himself. *A little less confidence* !

When the blanket was removed four pairs of eyes bent watchfully upon him and four sidearms were trained on his heart. The four unmoving barrels indicated Walcheri had utilised his position as stores officer; the eyes above them said their owners would take big risks for big stakes.

" If you shout you're a dead man," Audley stated.

Berno nodded. " You'll know these guns make no noise."

" If one of us misses, the others won't." Erroll seemed to find comfort in the words, though his cheeks were pale.

Geoffrey let a sneer cross his face, watching every move behind seeming nonchalance. " You'll never get away with this !"

" That's as maybe !" Walcheri was breathing heavily, sign of the haste with which he had summoned the two crewmen, Geoffrey guessed.

Audley closed the tape machine and withdrew the power plug. He rested it on the bunk. " Up in stores there's less chance of interruption, Captain," he said heavily. " We're going that way—just an engineer and two crewmen returning with you and the stores officer, understand ? Two will be in front of you and two behind. If we have to shoot it will include anyone you try to warn. We're too far in to turn back now—let that be your warning."

Geoffrey shrugged, but knew truth lay behind the words. If he

escaped the *Tetracil* would be too small for the four. Having gone so far, they could only maintain their safety by keeping him prisoner.

They left the cabin and strode down the corridor. Little enough chance they even meet anyone, he thought. It was an hour when those off duty mostly slept.

The lift would barely accommodate them. It halted at the stores section and Geoffrey wondered what vacant room Walcheri would use as prison.

" I shall soon be missed," he pointed out.

" Not so soon as to worry us."

Audley's tone showed he had checked duty periods. They rounded a corner and Geoffrey felt a shock. Unity Austin was coming quickly towards them, a roll of data from astro under one arm. He remembered the warning; knew he could not risk her life. Knew, too, that he might at least bank on the size of the *Tetracil*, which might assure the four did not know her.

She looked surprised to see him, and hesitated. " You weren't going up to astrogation, Captain ?"

" No, Miss Bell."

He hoped he had not misjudged her quickness of mind, or would believe he had actually forgotten her name. If not, his words might make sense . . .

They passed on and he did not look back. He could only hope she had heard and understood. Walcheri opened the last door of all, one of unusual thickness and hermetically sealed. All inside, he closed it with a dull thud.

" I don't need to tell you the purpose of this chamber, Captain."

For the first time Geoffrey felt a deeper fear under his unease. The four had chosen unexpectedly—but admirably. The ship's disposal chamber, sometimes used also for the direct loading in of supplies, was almost soundproof, because of its airtight door. The opposite wall was curved, with a second door that opened into space. Remote controls in the passage operated it. That alone was a subtle threat.

Audley plugged in the tape machine. " We wish to know exactly what it was Pakes did."

" How should I know !" Geoffrey snapped, a tiny, new excitement growing.

" We suspect you may ! Pakes was secretive, but told us enough to suspect what he was about." Audley depressed the start button. " We haven't made anything of this, yet, but with your help—"

He let the words drift into silence meaningly. Geoffrey felt triumph. He had feared their knowledge equalled Pakes's yet it was obviously less than his own !

The lieutenant's thin voice came into the room. Pakes had been very near consciousness, at times, Geoffrey decided. He had desperately wanted to tell he had meant no harm, but had tried to save—to save— Pakes stumbled on the words again and again. To save the fleet, Geoffrey thought. Pakes had collapsed without knowing of his own success. Underlying almost every broken phrase was a deep sense of personal guilt. Much had to be guessed. Pakes had studied the old anti-expansionist sect. A hobby had become an obsession. He had drifted into company with men of like opinion—Berno and Erroll first. Spacemen needed something to occupy them in leisure hours, Geoffrey thought. Bell had his chess. With Pakes it had first been the old cult of non-expansion, backed up by all its fear of eventual disaster.

The recording went on and on, often silent, often repeating itself. It was Pakes's mumbled, final excuse. The four moved uneasily often, watching, but Geoffrey almost forgot their presence. Pakes had first been in Barry Bell's cabin when on ground duty, months before.

The machine had been on a full hour when Audley pressed the stop button with irritation. " Mean anything, Captain ?"

Geoffrey longed to hear the remainder of the tape. All was slowly fitting, like some infinitely complex jigsaw puzzle. " It may." Indifference was in his voice.

" It better had !" Erroll spoke for the first time since entering the chamber. His lips were drawn back, revealing his teeth. " Pakes had found something *big* ! We want to know what that was. If not—" He snapped his fingers. " You've seen a man after sudden exposure to space, Captain ?"

" I can't tell you what I don't know." Geoffrey's voice was ice.

Erroll's lips opened, his eyes flashed, then his gaze snapped to the door. In one pace he was to it, swinging it wide. His free hand closed upon a slender arm. The girl screamed, but it was cut off by a hand. A weapon bored in Geoff's back warningly. She was dragged in and the door shut with a thud. Released, she sought Geoffrey's gaze.

" I— I couldn't find Barry Bell."

Geoffrey's spirits sank. She had understood, but failed. It was the nearest thing to complete disaster possible.

The four faces held no compassion. Erroll remained by the door, listening. Audley stood by the machine, his back to the curved wall. The silence was so complete that the ship might have been absent of life, Geoffrey thought. The chamber was a virtual air-lock, inner walls and door thick enough to withstand the piled up force of the ship's inner atmosphere. He had seen supplies ferried across from other ships and shunted in, but never expected such a use as this.

Audley started the recorder again. " We're more than half through. When it's finished we'll leave the pair of you a bit to think it over . . . If that's no help, well—I believe Walcheri is expecting he may be wanted to try the outer door remote control."

" Routine requires it," Walcheri stated.

Geoffrey felt contempt, yet admitted that their violent tactics had weight. The four did not outwit an opponent, or circumvent his opposition, but flattened him as with a road-roller so that resistance ceased.

The lieutenant's voice drifted again from the machine, picking up the thread woven half of delirium and half of sanity. " I didn't think they meant harm. They said the globe was easiest, that they wanted to help us—"

Geoffrey's attention became complete. The globe in the red triangle . . . !

Pakes's voice droned on, once again less connected, less the product of sanity and consciousness. But the words fitted, and from their integration sprang a picture. Pakes had unlocked the power of mind, giving it domination over matter. With rare insight he had understood the deepest implications of the *Whole Mind of Man*, forming them into one whole, and going on from that point. Geoffrey felt extreme admiration for the thin lieutenant's clarity of vision. Gone were limitations of time and space. Gone the finite nature of matter. Pakes's voice ended almost inaudibly: " A hyperant can make or destroy matter, atom beyond atom, universe beyond universe . . ."

Silence filled the chamber, broken by Walcheri's expelled breath. " That's the lot ! Make anything of it, Captain ?"

Make anything of it ! Geoffrey thought. It was a key, a revelation. Wooden-faced, he did not let his excitement show.

" It's difficult—disconnected and incomplete—"

The four faces grew hard. Audley jerked the plug free and went to the door. " We'll give you thirty minutes."

They filed out and the door thudded shut. Geoffrey guessed their purpose. First to return the machine, to avoid suspicion if someone else began investigating. Then to fake up some convenient alibi, again for their own safety, and to avoid trouble when Rosyth found his captain removed without trace.

His companion's gaze turned from the closed door to him. " What did he mean ?"

He pitied the girl. " This chamber opens into space, for loading. If the outer lock were opened with us here that would be unfortunate, but no one's fault."

Her lips quivered. " You mean we—we have thirty minutes ?"

" So it seems, and I don't doubt they mean it."

Geoffrey dwelt upon the lieutenant's words. Deep in Pakes's mind had been awareness of the great significance of his knowledge, forcing its way up through the cloudy layers above. Self-reproach had added the final stimulus: there had been contact of sorts between Pakes and the aliens, and they had provided the final touch to the growing pattern. A blending of time, space, molecules and mind, Geoffrey thought. Immanuel Kant had laid the foundation stone many centuries before, but all his work had been a mere introduction to the thought contained in the *Whole Mind of Man.* Pakes, again, had taken an equal step beyond . . .

A hand came on his arm. " W-what can we do ?"

He scarcely heard. Pakes, first hyperant, had succeeded. A blending of space and the stuff of mind itself. Gone were all physical barriers; gone, too, the limitations formerly imposed on man by the physical world. To know was to understand, and to understand fully was to *be* . . . time was not, nor space, nor the limitations of distance or the barriers of matter. The totality of all phenomena existed in the mind. It all fitted. The groundwork with Barry Bell, the years of discussion over the chequered board, the mumbled phrases from the tape . . . all were a wonderful completeness, now. After millennia mankind need no longer be denied his freedom, heritage as illimitable as mind itself.

Geoffrey took the girl's arm and they walked through the steel wall of the chamber. The others were gone, but Walcheri cowered in terror, lips twitching and face nerveless.

Flight Marshal Rosyth's light blue eyes held defeat. Some of the military erectness had gone from his back and shoulders and his face was that of a man who had tried his best and failed.

" You are not mistaken, Captain Abelard ?"

" No, sir." The inter-ship radio carried the full note of certainty. " There is no sol-type sun within reaching distance."

" Very well, Captain."

Rosyth turned about, thick brows so low that his eyes were hidden. Geoffrey pitied him, iron marshal defeated when success was most wanted. Equipment in the *Myridon* had scanned every neighbouring system. There was no planet ready to receive the foot of man.

" This means back to 6th base," Rosyth said. " There will be no 7th Empire."

Geoffrey entered the control room from where he had paused at the door. The feeling of new awareness and power had not left him.

" Will you wait before taking the fleet back . . . ? "

" Wait, Captain ?" Rosyth's gaze was penetrating. " Delay risks another attack—perhaps something we cannot escape."

Geoffrey glanced at the radarscope. The alien shadow had apparently drifted round forty-five degrees. Knowing its great distance, that movement represented a first-order space velocity no earth ship had ever reached.

"I know, sir. Yet I ask it."

The Marshal's eyes were unmoving. "You believe your request justified?"

"I do."

"Then I will give you twenty-four hours."

The eyes posed a question, but Geoffrey knew he could not explain, now. Only once again could he hope that Rosyth would accept his request without asking for reasons. He saluted.

"Thank you, sir—I hope your trust will be justified!"

He left the control room in silence, aware that every eye followed him. Walcheri and the others could wait, trapped, helpless mice. Alone, sole hyperant, he must grasp for his fellows mankind's heritage. Later, others could be shown—Barry Bell first . . .

The void between fleet and alien ship was nothing, his traversing of it without duration. The vessel was of astonishing dimensions and in a curved path at extreme velocity. He trod corridors lit by a pale blue light, universally diffused with no apparent source. Piezo-electric crystals large as a man floated from doorways ahead, each vibrating with inner awareness. Not of cell, bone and muscle, but sentient, they communed in a rapport of interlocking waveforms, questioning his presence. His sense of their inner awareness grew, and a silvery globe enclosed in a red triangle floated down the corridor, halting before him. Thought funnelled through it, asking if he was the life-form with whom they had first gained contact. He walked on. The crystals parted and drifted behind, glittering upon their many facets.

Life that had originated under extremes of temperature and pressure, he thought. Life, too, that was wholly dissimilar to man, probably considering him a strange creature unworthy of space in the cosmos. The globe drifted after him, echoing in resonance with the aliens' thoughts. Thus had they contacted Pakes, swearing their amicability while they learnt what the race he represented planned, and what they might do.

Thinking of the needle that had pierced Alpha Cleopa, and the missile speeding from the bell-shaped vessel, a twisted smile of disbelief remained on Geoffrey's face.

He walked through many corridors and chambers, seeing strange products of sciences unknown to men. As he went he felt the slow change of humour in the brainwaves from the globe. The beings

surrounding him were realising that here was no second Pakes, to be deluded or made traitor with nebulous promises. At last the thought was open hostility, predicting his death if he would not halt. A barrier came out of the walls ahead, cutting off the corridors beyond. Behind him, a strange machine with a glowing apex came from a door. He sensed the hate of the piezo-electric crystals. He and all his kind were alien, to be destroyed. Every living, moving form was a potential enemy, to be killed. Never had he imagined such complete, all-enfolding hate as surrounded him as the crystals drifted aside to let the glowing machine approach.

Better that they all be ended, he thought. He drifted timelessly between worlds, shredding their vessel to its last atom. Its molecules drifted into space, dispersing in a cloud of intergalactic dust. Their hate ceased, gone as a flame in a vacuum.

Space was all around him, sensed like a flowing river. The ships of the fleet glinted like fish in a dark sea, tranquil as before the appearance of the missile and hammer-fist of matter created by Pakes's mind. In his imagination Geoffrey stood in the void, and out beyond the ships, a hundred million miles away a sun glowed into golden life. Around her swung planets in their orbits, green and awaiting the ships of men.

Again he stood in the *Tetracil*, listening to the murmur of her power plant, and to the sudden movements in her. Rosyth's voice cut from the passage intercom.

" Will Captain Walney report."

" Reporting, Flight Marshal," he said.

" Good ! The alien ship has vanished. And astrogation says they've spotted a sol-type sun—"

Geoffrey smiled, walking towards the control room. Sunshine would be streaming into the astro observation nacelle. There would have to be long explanations. He wondered if Barry would find it equally easy. Possibly not, lacking the urgent drive of self-preservation. Walcheri, planning evil, had done good.

As he walked his mind drifted on the future. Suns and worlds for man, planet beyond planet, world beyond world, universe beyond universe. All were man's for the asking.

" What limitations would a hyperant have ?" he had asked.

Barry Bell had smiled at his silver knight. " None."

Geoffrey felt akin to an ancestor of millennea before, who had striven, wondered—and suddenly found fire his, and all men's, for ever. First they would colonise the planets of the sun that had glowed into golden life at his thought.

Francis G. Rayer.

An excellent method of getting rid of unwanted objects as well as rubbish would be by way of the Fourth Dimension. Just where the matter went would be a minor detail but could have awkward repercussions.

THE UNCONVENTIONAL DUSTBIN

By Duncan Lamont

Beaconsfield had been working on his synthesis for approximately fourteen months. Every working morning he would enter the laboratory punctually at nine o'clock and retire into the intricate maze of glasswork accumulated over countless distillations and fractionations. Each evening at five twenty-five he would emerge, wash his hands, light a cigarette, and go home.

His appearances and departures—or rather, the mathematical exactitude that characterised them—were a constant source of delight to Logie, the Research Director; the unaccountable meanderings of his fractionating columns, condensers, receivers, and beakers were not.

Beaconsfield was a brilliant man: forty-four published papers and notes in the six years preceding his engagement were surely proof enough of that. But this flood of tangible results had abated sadly since he had signed a four year contract with the Valney Research Foundation. His literary gifts seemed now to be channelled into the production of requisition forms. These flowed in an everwidening

stream through Logie's pending basket into the buyer's office. The variety and complexity of Beaconsfield's requirements were only matched by the quantities demanded. There were occasions when the Research Director seriously considered purchasing a few shares in the fine chemicals' market—if Beaconsfield was a typical consumer, he should be able to retire at least ten years ahead of schedule.

Naturally, Logie knew *exactly* what Beaconsfield was working on. In fact, he had suggested the subject himself. If, by some inconceivable mischance, he *had* forgotten, the information lay but an arm's length away in his magnificent steel-grey filing cabinet. There, inside a distressingly slim folder, was a sheet of top-copy typing paper with Beaconsfield's name and his task: *Fundamental Research on High Molecular Weight Polymers.*

Now, what could be plainer than that ?

At increasingly irregular intervals Logie would winkle the chemist out of his Pyrex shell and invite him into the office. The Research Director would then inquire as to his subordinate's progress. Beaconsfield, eyes aflame with eagerness, would pull a pencil from his pocket and proceed to cover the Foundation's stationary with formulae, equations, and a few notations that appeared to be uniquely his own. He would accompany this performance with a running commentary in pouncing, anxious-to-inform tones.

Logie was at a severe disadvantage. He was a physicist floundering in strange waters. And haunting him was the feeling that Beaconsfield's explanations would leave even the native fauna doubting the salinity of their surroundings. There was—to his benighted mind—something peculiar about the chemist's whole approach to the subject; but what that something was he lacked the technical knowledge to define. It was on occasions such as these that he cursed heartily the Board's decision to widen the Foundation's terms of reference, and infuse a little chemical activity into his hitherto happy flock of physicists and engineers.

Still, he strove manfully to understand—and conceal his ignorance. On one occasion, he took a sample of the defaced stationary to an acquaintance who practiced the mystic art.

" Ahah !" his friend had remarked, " polypeptide chains. A Friedel-Crafts reaction. Sulphonation here, followed by a . . . I can't quite make this out . . ."

Logie had rolled the sheet of paper into a neat spill and used it for lighting his pipe.

There were times when he put his mystification down to some peculiar flaw in Beaconsfield's expository powers. Perhaps if he engaged another chemist—even if only to function as interpreter. But

mental visions of glassware and requisition forms—multiplied by two —killed the fleeting thought stone cold dead. One bird in hand, he decided, was infinitely preferable to two in a glass shubbery.

It was a bleak, wind-blown afternoon in mid-March. Logie, resigned to supporting Beaconsfield and his glass mountain for a further period of two and two-third years, was consoling himself by reading a comprehensive, thoroughly understandable, report from one of his brighter young physicists. He had reached page nineteen and his pipe was drawing well, when Beaconsfield's months of labour culminated in a tangible result.

The glad tidings reached the office—via an interconnecting corridor —in the form of a shock wave that lifted the door across the room and disposed of it neatly through the large bay-window.

The Research Director sat for a moment, his eyes focussed three inches above his left thumb. Gradually, his tympanic membranes ceased to oscillate and his numbed senses struggled back to life. He rose to his feet and proceeded cautiously into the corridor.

Dust and fume caught at his throat and reduced the visibility to one nose-length. Glass, plaster, and—for all he knew—members of the staff, crunched beneath his feet. Dimly through the swirling, tumbling particles, a figure loomed towards him. He stretched out an unsteady hand and caught it by the sleeve. A face shot out of the haze, eyes burning fiercely. It was Beaconsfield.

" Ah ! Doctor Logie." His features split in a nigger-minstrel grin. " Isn't it wonderful ! I was just coming to fetch you." He took the shuddering Research Director by the arm and ushered him between the cascading walls.

Logie was halfway across the gleaming parquetry of the main laboratory before the incredible orderliness of his surroundings penetrated. He stopped abruptly. From the neat benches around him spotlessly garbed technicians eyed his dishevelled appearance with raised eyebrows. It was the tidiest explosion centre he had ever viewed. He turned to the chemist: " Where," he asked, biting the words off carefully, " was the explosion ?"

" It wasn't really an explosion. The reaction proved to be markedly exothermic—rather unexpected actually."

" *Where was it* ?" Logie, who was feeling rather exothermic himself by this time, put a trifle more emphasis behind his repeat.

" Over there." Beaconsfield's finger pointed obligingly towards an obviously intact hundred-litre flask.

The Research Director took a deep breath. " Shall we inspect the scene of the catastrophe ?" he suggested carefully. He walked over to the flask keeping a cautious eye on the other all the while.

Together, they peered inside. Cowering coyly at the base of the glass mausoleum was a minute drop of golden-brown resin.

Logie sighed. " You've been working hard recently, Beaconsfield." He sighed again. " Too hard." He laid a fatherly hand on the other's sleeve. " Rest is what you require—to get away for a bit . . . say, two and a half years ?"

But Beaconsfield was scrabbling in a drawer with his unattached hand and the suggestion went unheard. He finally produced a long nickel rod and inserted it into the neck of the flask. By dint of a few gingerly pokes he succeeded in freeing the resin from its anchorage. Reaching inside, he lifted it out and placed it carefully in a sample bottle.

" Beaconsfield . . ."

" There !" said the chemist with satisfaction. " This'll shake Vinofski !"

Logie could well believe it. It had shaken him—an insular, phlegmatic Briton—to the tips of his nylon reinforced socks. Its effect upon one of a more excitable—or Continental—disposition could be easily imagined. The Research Director's eyes swung wildly around the laboratory and settled on the awestruck visage of very junior Laboratory Assistant Jones. Jones turned bright crimson and busied himself with pad and pencil. Logie, supping subconsciously the almost-forgotten nectar of power, felt his scattered faculties congregating. Giving the bent head a stern look, he said: " Beaconsfield !"

The chemist lowered his sample bottle. " Yes, Doctor Logie ?"

" Beaconsfield, would you be so good as to explain how an explosion originating in an intact glass vessel wreaks havoc forty feet away—through a completely undamaged wall ? Also, would you enlighten me regarding the remarkable degree of indifference exhibited towards this phenomenon by your illustrious colleagues ?"

" Oh," said the other blankly. He returned his bottle to the bench. " But, naturally, they didn't hear anything."

" I see," commented Logie, his gaze singeing the unoffending Jones' mop of cranium-covering. " They didn't hear it. Do you realise that I—two solid brick walls away—had my eardrums almost ruptured? *Is every mother's son in here stone deaf* !"

" But Doctor Logie ?" Beaconsfield's tones were plaintive—almost hurt. " As I explained to you quite recently, a considerable proportion of any energy liberated by the reaction will be dissipated via the fourth dimension. Its point of re-entry into our normal time-space system is completely unpredictable."

The Research Director groaned softly. " You never mentioned the fourth dimension."

Beaconsfield was shocked. " Of course not ! The term is a very loose figure of speech with no solid scientific basis. I would not dream of using it in a serious discussion."

Logie took the chemist by the arm. " Let us find a quiet spot somewhere," he said pleadingly, " and have a frivilous scientific discussion."

Ignoring the marked popping of the other's eyes, he led him between the benches, out a side-door, across the quadrangle, and into the canteen coffee room. Waving over a waitress, he ordered two cups of black coffee and a packet of cigarettes. When they arrived, he pushed the cigarettes towards Beaconsfield and reached for his pipe.

" Now . . ." he remarked, striking a match and watching the healthy puffs of smoke drifting diffidently towards the ventilation grill.

Beaconsfield excavated a cigarette from the packet, restrained himself at the last moment from stirring his coffee with it, cleared his throat, and twisted awkwardly in his seat. Logie observed these expressions of uncertainty with satisfaction. He blew gently with empty lungs, and through the temporary tunnel thus created remarked: " Fourth dimension, did you say . . . ? "

The chemist pulled a pencil from his pocket, threw a despairing look around the paperless tabletop, tucked it away again, and started: " The bond energies involved in a condensation type react—"

The Research Director waved an admonishing pipe. " *If* you please: a general survey in popular form. Simple, straight-forward, with as many image-provoking analogies as you deem feasible." He leant back comfortably and relaxed. Having disembarked from the frail bark of technical authority he was bent on a memorable night ashore.

Beaconsfield rescued his cigarette from the saucer and lit it. His manner was calm and resigned. With the stiff upper lip characteristic of the Englishman faced with an unpleasant duty, he prepared to reduce his subject to understandable terms.

" As you know," he started, in a pathetic attempt to simulate the atmosphere of serious scientific discussion, " polymeric materials are of three basic types: firstly, linear, in which the molecular units are joined head to tail to form long chains; secondly, planar, in which the units are linked to form sheets; and thirdly, cubic, in which the units are linked to one another in three spacial dimensions."

" Quite, quite," said Logie encouragingly. He knew this bit, but thought a word of reassurance would not come amiss.

" Well," continued Beaconsfield, " I have prepared a polymer which extends in four dimensions, by taking advantage of the phenomenon known as steric hindrance." Logie stirred irritably at the unfamiliar

phrase and the chemist continued hurriedly: " That is the term used when parts of the molecule adjacent to a reactive centre are so bulky that they block the approach of other molecules. Under normal conditions the reactive centre is effectively de-activated."

" The door is closed," remarked Logie, providing his own image-provoking analogy.

Beaconsfield winced, but nodded submissively. " I have succeeded, by suitable choice of reactive groups and conditions, in forcing a sterically hindered group to react."

" You have knocked the door off its hinges," puffed the other with relish.

" Not quite," said the chemist, producing an image-provoking analogy of his own, " I've put two pints in a one pint pot."

" And the extra pint has been forced into the fourth dimension !"

" Exactly."

" Capital !" The Research Director blew an enthusiastic cloud of nicotinic vapours across the table. He leant his elbows astride the untouched cup of coffee and continued: " Now, what applications has this polymer ?"

" Well . . ."

" Give the matter your consideration. You'll probably need to do a few tests on the material. This opens a vast field for investigation." Logie smiled depreciatingly. " I must admit I had a few doubts about the advisability of our venture into this new field, but you've resolved them all. A very sound piece of work, Beaconsfield."

" Thank you, Doctor Logie," said the other, beaming with gratification. " Your co-operation has made my task a pleasant one."

They raised their cups and drank.

Logie let things lie for a week. He was delighted with the importance of the research, but couldn't for the life of him think of an application. At times this worried him—applying discoveries was a major part of his job—but he would mentally pass the baby to Beaconsfield and busy himself with other work. Perhaps when the properties of the polymer had been fully investigated . . .

Beaconsfield entered the reconstituted office bearing a bulky sheaf of papers and a lugubrious expression. He lowered the papers onto the desk and settled the expression more firmly in position.

Logie paused with pipe and match poised. " Is something wrong, Beaconsfield ?"

The other sighed and gestured towards the papers. " I've checked the resin from every angle. Its just a common or garden three dimen-

sional variety. All that's happened is that I've annihilated the fourth dimensional component."

"A purely destructive process," mused Logie. "No . . ."

"No !" said the chemist emphatically. "It couldn't be made into a controllable bomb."

"Oh." It was Logie's turn to sigh. Delightful visions of a full-scale Government project headed by Sir Charles Logie, O.B.E., etc., faded reluctantly.

"Before the material could be annihilated," explained the other, "it would have to be modified sufficiently to permit reaction. The energy release is also a problem since its point of re-entry into our normal space-time system is wholly unpredictable—as you have no doubt observed."

Logie winced reminiscently; then forced his mind resolutely back to the problem. "The resin itself is of no commercial value, therefore we must concentrate on the disposal side of the business. It is very difficult. You realise, of course, that we shall be in direct competition with dustbins—and they have an appealing simplicity about their modus operandi which is—I fear—lacking from your process."

Beaconsfield admitted the flaw.

"What we want," continued Logie, "is something that the conventional dustbin boggles at. Something that is so unpleasant that people will gladly pay the extra to see it . . . eliminated. Now, what have we . . ."

"There is one other point," interrupted the chemist. "This energy release . . ."

"You *are* bent on making things difficult," commented the Research Director peevishly. "This hypothetical material has now assumed a nature so repugnant that people will be prepared to pay its freight charges to some isolated part of the country as well. I fear, Beaconsfield, that I must admit defeat. I give up. What is it ?"

"Atomic reactor waste products."

Logie dropped his pipe. "Beaconsfield !" he cried. "You are a genius !"

The other blushed modestly. "It would really be quite simple. A few carboxyl groups attached to the chain structure would absorb the radio-active metals and . . ."

"I'll contact the reactor people," said Logie eagerly. "Get them to send over some samples. When can you be ready ?"

"Anytime. I could do a small test in two days time if they get the stuff over quickly."

"They will," promised the Research Director, reaching for the phone.

They did.

The early trials worked beautifully. The large area of waste ground adjacent to the Foundation had a prototype reaction unit—operated by very-remote control—installed at its geometric centre. Into this hole-in-the-Universe incredulous atomic engineers poured lead-lined pailfull after lead-lined pailfull of modified reactor waste. Then, over the ramparts provided by the energy release they would crawl, dragging sixteen different types of radiation detector in their wake.

When the last reformed sceptic had finally screwed the back into place on the ultimate triple-checked detector—they were in business.

The first full-scale plant was constructed on a small isolated island off the Scottish coast. It functioned perfectly, raising the temperature of the Gulf Stream by a fraction of a degree in the process.

The Government breathed a collective sigh of relief and authorised the construction of forty more atomic power stations. The Valney Research Foundation licenced out its process to fifteen different countries—and proceeded to expand its activities in the chemical field with the delicate selectivity of an exploding bomb. Sir Charles Logie, O.B.E., etc., handed over the administration of the Chemical Section to Beaconsfield, O.B.E., and started to rough out his memoirs on odd pieces of the Foundation's stationary. Beaconsfield wrote his forty-fifth paper and followed it up with a considerable number of popularised versions packed with image-provoking analogies.

Everybody was as pleased as Punch.

Well . . . for a time, at least . . .

Logie had got no further than a rough draft of chapter fifty-nine of his memoirs, when the blow fell. It actually fell in a corner of the main laboratory—now under the jurisdiction of the Chemical Section—but the reverberations of one hundred litres of polymer expanding its way out of a two ounce sample bottle echoed through the whole building.

The Physical Research Director smiled quietly to himself as he rose to investigate. He was growing to associate loud noises with pleasant consequences. He mused dreamily as he proceeded along the corridor. Perhaps a barony . . . he'd buy a place in . . . say, Wales, and . . .

He walked through the cautiously congregating chemists and glanced downwards. One hundred litres of linear polymer—looking remarkably fit, despite its sojourn in another dimension—leered up at him balefully.

His spacious barony in Wales had shrunk to an eight foot square cell in a less salubrious environment, by the time he had located Beaconsfield.

"Now," commented the latter philosophically, "I wonder how that happened? Possibly the molecular bonding is unstable."

" Does that mean that *everything* disposed of by your method is liable to come bouncing right back again ?"

" I wouldn't be as dogmatic as *that*," said Beaconsfield cautiously. " But it is a definite possibility."

Logie took a very deep breath. " You realise, of course, that a full-scale plant in the Western Isles has disposed of *tons* of highly dangerous material by this means ? Also, that the process is being used under licence in fifteen different countries ?"

The other sighed. " I suppose," he said reluctantly, " it would be advisable to evacuate the plants. You had better warn them."

Logie, dripping cold sweat over his unpublished memoirs, phoned the appropriate authorities. After a prolonged conversation packed with image-provoking analogies, he dispatched cables to fifteen assorted countries. He next contacted Overseas Airways regarding flights to fifteen other countries. He scribbled the replies down in the margins of his memoirs—then rolled the annotated pages into a spill and used it for lighting his pipe. His condition could be summed up as distraught.

The Board of Directors of the Valney Research Foundation assembled at a special meeting the next day. Beaconsfield, refreshed by a good night's sleep and adequately armed with paper and pencil, met them head-on. He had a theory which explained the importune resuscitation of his polymer. The Board heard him out with stoney-faced resignation.

" So," said Beaconsfield, as the last scrap of mutilated stationary completed its round and fluttered down before him, " our error appears to have been in considering the missing component as projected into a fourth *spacial* dimension, whereas it was actually projected forward in *time*. When the time period associated with the bond energy relapsed the linkage became unstable and the polymer broke down into its component parts."

The chemist's voice died into a pregnant silence that threatened to drag on for hours. At last, the Chairman stirred uneasily in his seat, and said: " Interesting." He followed this remark with a pensive perusal of his eleven fellow-sufferers. But there was no advance, so he closed the bidding with a brisk, " If you would care to wait outside . . . "

Beaconsfield gathered his papers together and left.

The jury was out forty-nine minutes.

Their verdict was unanimous.

Does anyone wish to purchase a small, isolated island off the Scottish coast ? . . . or engage the services of an experienced chemist with forty-five papers to his credit ?

Duncan Lamont.

EMERGENCY

Spaceships—especially the small freighters—will have a lot in common with the submarine, especially in respect of their air supply. The vital difference being that the spaceship will have a lot further to go for fresh supplies of air; in fact any ship in such a predicament will be more than lucky to make base.

CALL

By Alan Guthrie

Illustrated by HUNTER

I awoke to the sound of the emergency alarm and was up and halfway to the control room before I was fully conscious of what I was doing. Martin was there before me, he must have been awake, and together we stared at Walker. He stood before the instrument panel looking baffled and acting as though he didn't know what to do. Captain Klien reported last, his heavy features drawn with fatigue and his eyes still glazed from shock. He scowled up at the speakers and shouted above the noise.

"Can't someone turn that thing off?"

Walker reached towards the panel and threw a switch. The grating sound of the alarm stopped and I relaxed, wondering which genius had chosen that particular sound for the emergency signal. It was effective, no one could ignore the amplified moan which sounded like pain and fear, but it was hard on the nerves.

"Well?" In the silence Klien's voice sounded unusually harsh. "What's wrong?"

Walker had been on duty-watch and he should have known. He didn't.

"Just checking, sir," he reported. "Space is clear both on radar and direct vision. The instruments report nothing abnormal."

"So the alarm just went off for no good reason, is that it?"

"I don't know, sir."

Klien snorted and pushed Walker to one side away from the panel. I was watching and I saw how he reacted. It wasn't hard. We were all wearing the regulation shorts and sandles and it's impossible to hide involuntary muscular reaction in that kind of dress. He wanted to hit Klien. I wasn't surprised, the captain had been riding him ever since we left Tycho, but now wasn't the time or place to do it.

"Switch on the alarm," ordered Klien. He could have done it himself, the toggle was less than five inches from his left hand, but he was pulling rank. Walker obeyed then shut it off again as the speakers began to vibrate.

"Leave it on, Walker." Klien was being awkward. "Something is wrong aboard this ship and we've got to find out what it is."

"Yes, sir."

Martin glanced at me as the alarm sounded and I guessed how he must have felt. He'd lost his wife and child in a stratliner crash a couple of years ago and the sound must have woken unpleasant memories. Klien didn't like it either. He stood it for almost a minute then hit the toggle with the edge of his hand.

"That's enough." He glared at the instruments as if cursing them for not telling him what he wanted to know. "Martin! Check for leaks. Walker! Check the wiring of the alarm. Denton! Scan space with the radar."

"I've already checked the radar, sir," said Walker stiffly. "Report negative."

Klien ignored him and I sat before the controls. I didn't expect to find anything but I knew better than to argue. The operation of the radar was automatic and, had there been anything within range, it would have aligned itself long ago.

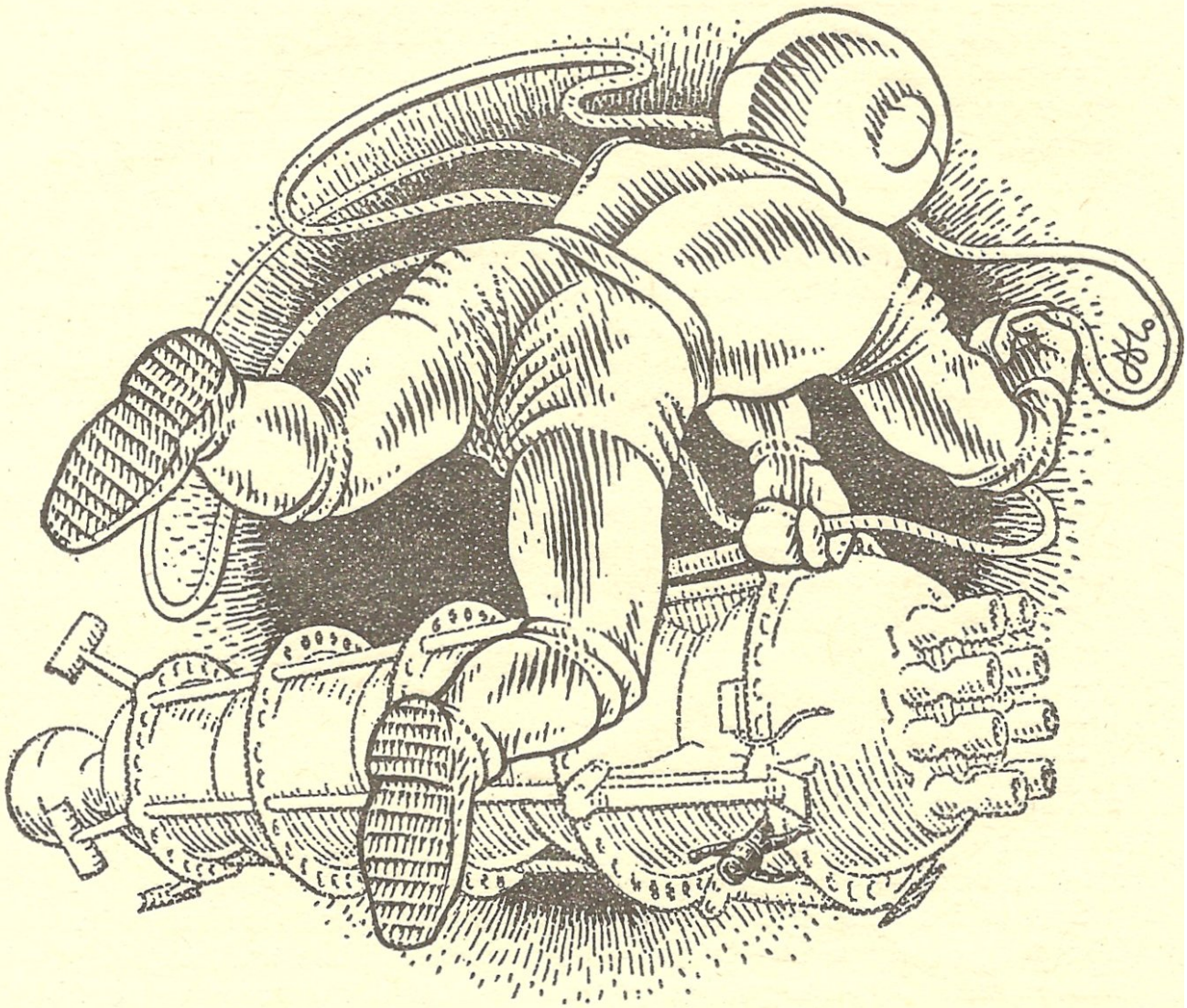
Behind me I could hear Klien working at the instrument panel and I jumped as the alarm came on, then off, for a brief moment.

"Find anything, Denton?"

"No, sir."

"Keep trying."

It was a waste of time and we both knew it and I was annoyed at Klien using me to take it out of Walker. Even though he had been on duty-watch he could only have had at the most ten seconds before we responded to the alarm. It would have taken all of that to check the radar let alone the instruments.



" Report negative, sir." I rose from my seat and glanced at the ranked dials. They looked as they should have done. Not one of them showed the red flush which would have signaled that something in their department was wrong. I was still looking when Martin returned with Walker following him. Both reports were negative.

" This is ridiculous !" Klien sucked at his lower lip. " The alarm went off for a reason and we've got to find out what that reason was." He looked at Martin. " We're air-tight, you say ?"

" Yes, sir. I've checked the living quarters."

" No fault in the wiring, Walker ?"

" None that I could find, sir."

" And nothing in space ?" He looked at me and I stared back.

" No, sir. As reported."

" And yet the alarm sounded off." Klien switched it on again and my nerves crawled to the irritant sound. " It's still sounding off." He slammed his hand against the toggle. " If the trouble isn't in the living quarters then it must be elsewhere. As the instruments don't seem to be reliable we'll have to do it the hard way. General investigation. Move !"

General investigation meant that we had to examine every inch of the ship with hand and eye until we found what was wrong. I led the way to the suit locker and pulled on my undersuit before struggling into the tough outer covering of fabric and plastic. Martin helped me and I helped him then both of us helped Walker. Klien would stay behind in the control room where he could talk to us over the inter-suit radio.

" You will be in charge of the search, Denton," he ordered. " I needn't tell you to hurry."

" No, sir." I lifted my arm towards the others and spoke into the radio. " Testing. Martin ?"

" Here."

" Walker ?"

" Here."

" Test over. Martin and Walker will check the cargo compartment and I'll go through to the third ball. Ready ?"

I waited a moment until they had answered and then led the way into the corridor.

Space ships are a lot different to what most people had once imagined. The torpedo shape had proved utterly impracticable and, together with streamlining, had gone early into the discard. There is no need for streamlining in space. Also, as the ships never land on a planet but merely orbit or touch down at a satellite, we don't need tremendous strength either. Other considerations have gone into the final design and the end product is an asthetic mess.

In front we have the living quarters and control room in the shape of a ball. Behind it, another ball, is the cargo compartment. Behind that, again a ball, is the air and water and other essential supplies. Then the fuel tanks, more balls, and finally, as far from the living quarters as we can get it, the atomic pile and main drive tubes. The whole thing is fastened together with struts and artificial gravity is provided by minor tubes which both spin and steer the ship.

Imagine half a dozen balls of wool speared on a knitting needle and you have a space ship. The corridor is the central knitting needle.

I slammed the air-tight door behind us and bled off the pressure. The red lamp changed to green and I pushed open the door giving

onto the cargo compartment. I didn't waste any time looking at the stacked boxes and bales, the sacks and packages lashed and tied to the stanchions. Checking that was Walker and Martin's job and I left them to it. Another set of double doors, useless really as no part of the ship other than the living quarters held air at normal pressure, but handy in an emergency, and I passed into the essential supply compartment.

And into one of the worst messes I have ever seen.

"Captain." I spoke into the radio and waited impatiently for a reply.

"Yes?"

"Denton. The trouble is in the third ball. A meteor from the look of it."

"Serious?"

"Could be." I stared at the mess knowing that no matter how I hurried it was too late to do anything. "Looks as if it punctured the hull and exploded among the supplies. The place is full of frost. Better ask the others to come through and give me a hand."

"Right."

Asking him to relay my orders was mere formality, they would have heard what I said and be already on their way, but Klien was touchy enough without giving him cause for complaint. I'd located the hole by the time they joined me and together we slid down to where the metal of the hull showed fused and bent. It was jagged, covered with ice, and looked exactly as if a shell had hit it. Literally, that is just what had happened. A meteor, perhaps only a small one, but moving at incredible velocity had ripped through the thin hull like a bullet through paper.

We knocked off the ice and flattened the metal as much as we could. I smeared the hull with adhesive and slapped on a soft rubber patch. That job done I straightened and had a closer look at the damage. It was easy to see what had happened.

Our oxygen was carried in thin-walled flasks. Liquid, of course, but that didn't matter as they were protected from direct heat. Boiling was slight and taken care of by safety valves and the system worked perfectly. Had worked, that is, until the meteor had exploded among them. When an object is travelling very fast and it hits something it either moves that something out of the way or is stopped. If it is travelling very fast and the thing it hits is too stubborn to move it literally explodes into incandescent vapour. The meteor had exploded, venting all its tremendous kinetic energy into heat and that heat had immediately caused the liquid oxygen to boil. The flasks were thin,

they had disrupted in a hail of shrapnel which had spread the damage throughout the compartment and our air and water had gushed free.

The same centrifugal force that provided our artificial gravity had done the rest. The air and water had simply expanded and spurted out into space.

And we were half-way between Earth and Mars, twenty-five million miles from the nearest planet.

It took more than four hours to clear up the wreckage and assess the damage and by that time I was almost collapsing from the heat. Space suits are air-tight and non-conductive, they have to be for full protection, but I kept generating heat from my own metabolism and that heat couldn't escape. I was streaming with perspiration by the time I managed to struggle out of the fabric and plastic and my under-suit, worn merely to prevent chafing, was a limp rag.

I hung it up to dry, dried myself with a towel, and together with the others went to make my report.

Klien heard me out without interruption.

" Oxygen a total loss, you say ?"

" Yes, sir. We were unlucky. Most of the water has gone too, but that isn't so important."

" No," he agreed quietly. "It isn't, is it ?" He seemed to have calmed down while we had been working and I was glad to see it. He rubbed at his chin and stared at the instruments. Sight of them reminded him of something. " How is it the damage didn't register ?"

" Freak accident, sir. A scrap of debris lodged in the tell-tale and prevented the air-loss from closing the contacts."

" Did it prevent the meteor from registering too ?" He asked me but I knew the question was aimed at Walker.

" It was a small one, sir," I said. " and moving fast. I doubt that it would have registered."

He grunted at that and rubbed his chin again. I knew what he was thinking, we were all thinking the same thing, but each of us waited for the captain to put it into words. He said something but I didn't hear him because, at that moment, something like a dagger stabbed at my brain and white fire exploded behind my eyeballs.

I'd been hit before, we all had, but this time it was something special. It wasn't just the pain, that was soon over, it was the knowledge that, at that moment, I had died a little. I blinked and found Klien staring at me.

" A bad one ?"

" Pretty bad." I rubbed the base of my neck and tried to grin. " A direct hit by the feel of it. I'm catching up with you, Captain."

"Maybe." He stared at me, wanting to help, but knowing there was nothing he could do or say which would be the slightest use. I was a target, we were all targets, and that's all there was to it.

But it wasn't nice.

It never is nice to feel the disintegration of a cosmic ray particle. It's like being shot with a microscopic bullet. You can't feel the actual penetration, it's too small for that, but you can feel it when it hits an atom and disintegrates with the consequent release of electrical energy and radioactive poisons. The energy irritates the optic nerve and registers as a flash of light. The poisons cause old age.

On earth, protected by the atmosphere, you only get the secondary radiations, but they are bad enough. Deep sea creatures protected by a mile of water don't suffer from old age. In space, without any protection at all, we received the full dose. Most of them, fortunately, drilled right through without damage. Those that did hit carried their full energy and the disintegration caused a little pain. And we grew old—fast!

"To get back to what I was saying." Klien turned from me and glanced at the instruments. "Walker! How long will it take us to reach Mars?"

"Two months at present rate of travel, sir." He moved towards the computator. "Do you want the exact figures?"

"Will they help?" Klien shrugged. "According to your reports we have lost all our air except what is in this compartment. It won't last us anywhere near two months. I think, gentlemen, that the problem is obvious."

It was. I had known it from the first and so had the others. Simple? Too simple. We had no air. At the present rate of consumption we had about a week to live.

And Mars was two months away.

I had often read fiction about similar circumstances and, rarely, I amused myself with thoughts of what I would do in such a situation myself. Now that it had come to it there was surprisingly little we could do. Rescue was out of the question, we couldn't hope for that until we had made radio contact with Mars when they would send out a tug, but first we had to get there. If we were to live at all it would be through our own unaided efforts.

"There are two things we can do," said Klien. "Increase our speed and lower our consumption of air. Both are limited." He looked at me. "Denton. How soon and for how long can we use the main drive."

" Immediately. Normal working. The tubes have cooled by now."

" Good. Martin, work out the increased thrust we can obtain by jettisoning our cargo. While you are doing that Walker can begin the dumping."

" Yes, sir." Martin took the manifest and went over to the computator to work out the reduced mass. Walker didn't move and Klien stared at him from beneath his eyebrows.

" Well ?"

" Is it essential to dump the cargo, sir ? Isn't there some other way?"

" We can die," admitted Klien. " They will pick us up when we reach Mars and take us in tow. They may even give us a decent burial Does the cargo mean that much to you ?"

" That isn't the point, sir." Walker flushed beneath Klien's sarcasm. " It may mean that much to Mars."

" An operating ship will mean much more." Klien looked at the young man. " You don't seem to have grasped the position, Mr. Walker. We can't rely on a miracle. If we hope to live then we must act and think like sensible men. We will dump the cargo."

" Yes, sir." Walker turned away then stopped as Klien called to him.

" Walker !"

" Yes, sir."

" All of the cargo, Walker. Every bit of it."

" Yes, sir." He turned away and I watched him go. Beside me Klien sucked in his breath as if in pain and I knew that another cosmic bullet had found its mark. Idly I wondered how many more he could stand. Youngsters in space always began by counting how often they'd been hit. They even had a theory that they could take just so much without harm and then retire to live a normal life. None of them ever did.

Maybe it was because the pay was good, or maybe it was because that once you've seen the naked glory of the stars you can never be satisfied with anything else, I didn't know. Personally I'd stopped counting a long time ago. I'd stopped using a mirror about the same time and, sometimes, I even managed to forget when I was born. Little things like that helped.

" He's a good kid," I said to Klien. " Why are you riding him so hard ?"

I took a chance and I knew it but we'd been together for ten years now and, in space, that's a long time. I hoped that the captain would forget he was on duty and relax as he did when we were alone. He hesitated, then decided to be human.

" You like the kid, don't you ?"

"He's all right. A little star-happy but that's to be expected. This is his first trip out."

"Yes," said Klien. "You know what's going to happen when we get back to Tycho, don't you?"

"I've thought about it," I said. "It's pretty obvious." It was. The normal crew of a space ship was three men. Two would have done and some said that a single man could handle a ship, but they always used three to avoid psychological disturbances. The only time we ever carried an extra man was when one of us was slated for retirement.

"I'm the oldest," said Klien. "I'm going to be grounded when we get back. Walker's going to be the next captain."

That didn't surprise me either. Both Martin and myself had seniority but that counted against us, not in our favour. You either became a captain early or you didn't become one at all. Not that it mattered all that much. The pay was much the same and the conditions identical.

"It comes to us all," I said. If I was surprised at Klien's attitude I didn't show it but he knew what I was thinking.

"You're wrong, Denton," he said. "It isn't sour grapes. I've had my chance and I've been expecting it. But I don't like to see Walker take over."

"Any particular reason?"

"Yes." He hesitated. "Have you ever been married, Denton?"

"No."

"I have. It was a long time ago, when I was young." He didn't say how long ago but I was beginning to guess. "We parted and she married again. Do I have to draw a picture?"

"She married a man named Walker," I said. "So the kid is . . ."

"My son." He didn't sound happy about it. "He doesn't know and you're not to tell him." He laughed, a sound without humour. "No chance of his guessing. He wouldn't think an old man like me could be his parent."

Klien was about forty, a couple of years older than myself, but not even the most generous estimate would have put him at less than sixty. When he retired he would be fit only for an old people's home. I tried not to think about it.

"So now you know why I don't like to see the kid ruin his life," said Klien. He hit the bulkhead beside him with a sudden viciousness. "Damn space! Damn it! Damn it! Damn it all to hell!"

I didn't answer.

Dumping the cargo took time and I had to spell Walker to give him time to cool off. While he rested Martin and I tackled the job and

between us we cleared out the compartment. It hurt to see all those goods flung into the void but there was no help for it. Mars would have to do without the medical supplies, seeds, machine tools, components and other things they so desperately needed.

The cargo cleared we turned to the living compartment. We had a problem which could only be solved one way. Mass against thrust against time. Cutting down the mass increased the thrust and cut down the time. There were other considerations but they would come later.

So we threw out every scrap not strictly essential to life. The mattresses, the books and games, the eating utensils, the little things collected over a lifetime and each with their memories. Photographs, clothing, souvenirs, everything.

It was like throwing myself into space to see them go.

Finally we were ready to fire the main drive and start our race against time. Martin had worked out the course and Klien had cut spin on the ship. Now we coasted in free fall and I hated every minute of it. Men weren't born to be weightless. It is impossible to eradicate the primitive fear of falling, and, during the time it took to re-align the ship we suffered agonies from nausea. I was glad when we could start spin again and get some gravity.

" She's all yours," said Martin. He looked tired. " I've plotted a course so as to reach radio range as soon as possible. No fancy stuff. Just let us get close enough so that they can come out and help us."

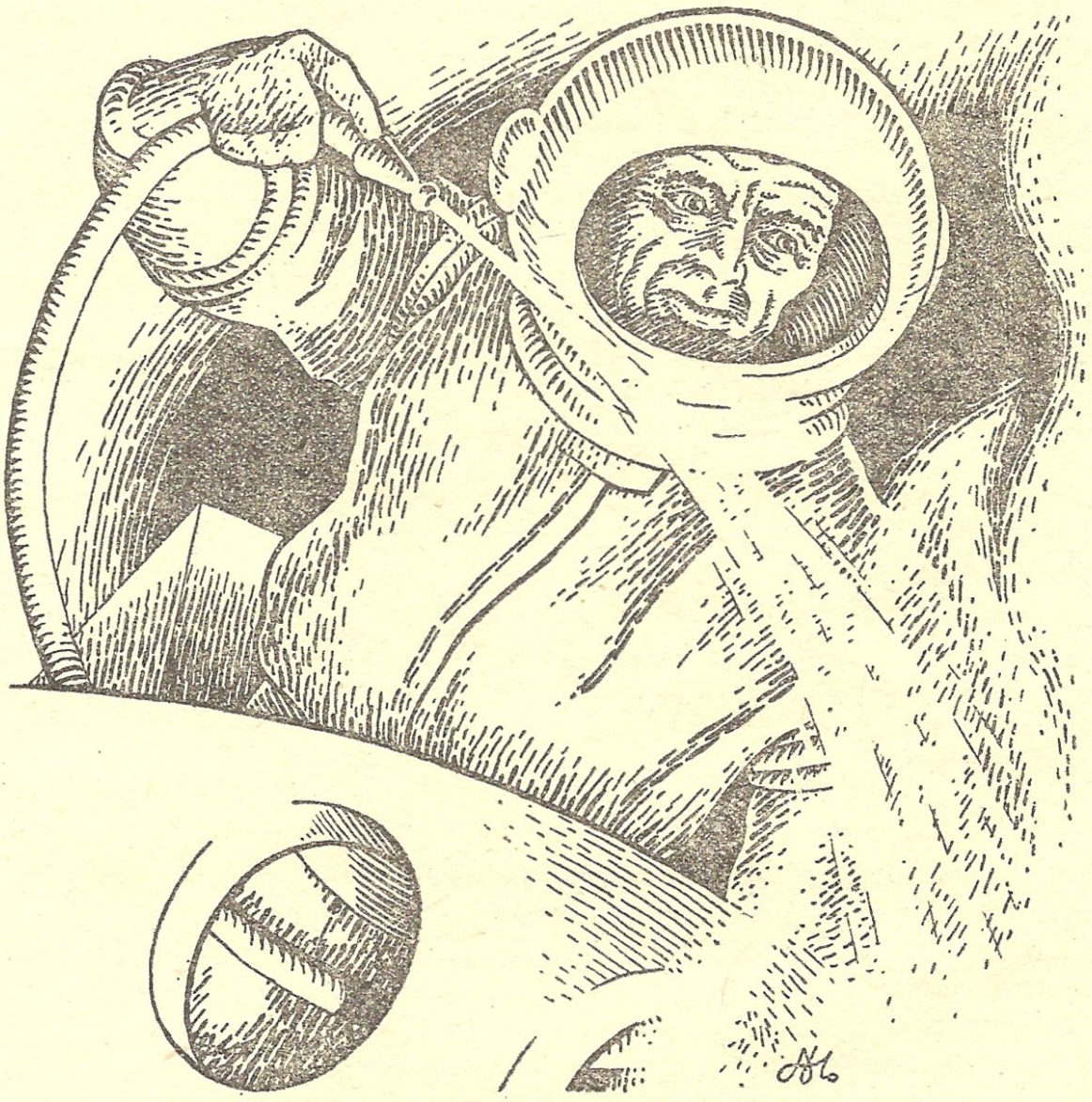
" Good enough." Klien nodded to me where I stood by the firing controls. " Let's get moving."

I moved the levers and felt the slight jerk as the main drive flared into life.

Slight jerk. No sudden thrust of high-G acceleration. No crushing weight and numbing pressure. There was no need for it so we didn't have it. Staying in space as it did the ship needed very little thrust to set her on her way. A steady, gentle thrust was all that was necessary. Sixty minutes of firing served to give the ship sufficient momentum to coast between the planets. A little less to slow when reaching Mars because of the solar drag. A little more when approaching earth for the same reason. Sixty minutes.

Six ten-minute bursts. Not because of the restrictions of fuel. Not because of economy or structural strength. But simply because the tubes couldn't stand any greater heat.

Take hot metal. You can watch it glow and lose heat that way—that is radiation. You can blow on it and let the air take the heat away—that is convection. You can dip it into water—and that is conduction. They are the only ways of transferring heat from one body to



another—and in space you can't use the last two. Heat has to be radiated away, there is no other way to get rid of it, and a rocket tube gets awfully hot. It has to, the greater the speed of the exhaust the greater the thrust and you can only get high speed by using heat.

After ten minutes of firing the tubes were on the edge of fusing point and had to be allowed to cool.

While red hot they radiated pretty fast which was good. But they were also fastened to the ship and the heat leaked down the struts by conduction. With a temperature of several thousand degrees at the rear it didn't take long for some of it to pass down the metal into the living quarters. Which was why the rest of the ship was a near vacuum, not to save air, but for insulation.

We could cool the ship, of course. We did it by bleeding off the air. Air cools as it expands and while we had air to spare we managed to remain comfortable and safe. But now we had no air and the tube-temperature was climbing. I sweated in anticipation as I thought about it.

I fired the jets for the maximum period, hanging on until the thermometers hovered on the danger-line, then I cut the firing and looked at Martin.

"Give me time," he grumbled. "This computator wasn't designed for this sort of work. Too many variables."

"We didn't fire for ten minutes." Klien had been timing the firing. "I made it fifty seconds short. What's wrong?"

"Residual heat, sir," I said. "I'm operating according to the thermometers."

"Are you allowing normal cooling period?" Klien's voice was sharp and I knew what he was getting at. If we allowed normal cooling periods between firing we'd be dead before we'd trebled our velocity.

"No, sir." I took a deep breath. "I have an idea to hasten the cooling of the tubes, sir. Have I your permission to use some water and air?"

He nodded.

My plan was simple. I wanted to hasten the cooling of the tubes and the only way to do it was to spray them with water. I rigged up a drum and filled it with water under pressure. I fastened a hose to it with a spray-nozzle and attached straps for securing it to the struts. The hard part came when I tried to get it outside and back to the tubes. In the end we had to cut spin and go into free fall.

Even then it wasn't easy. Walker came out to help me and, in between bouts of retching, we managed to crawl back to where the tubes glowed almost white hot against the blackness of space. I lashed the tank and made sure that my safety line was secure.

"All right, Walker," I said over the radio. "This is as far as you come. Get back into the ship now."

"Why?" He inched closer. "Two of us could do the job faster than one."

"Get back inside the ship." I made my voice sharp. "Do I have to ask the captain to order you back?"

He looked at me through his faceplate, seemed about to say something, then went back without a word. I watched him go and, when I was sure he couldn't interfere, I crawled towards the tubes taking the hose with me.

I tried not to think about what was beneath me as I clambered into position.

Aiming the nozzle at the base of the tubes I pressed the release and sent a spray of water towards them. I'd done a good job on the nozzle, the water came out in a fine mist, settled on the tubes, was instantly converted to steam, and expanded into space. As it went it took some of the unwanted heat with it.

There were two dangers in what I was doing. One I didn't let myself think about, the other was that too rapid cooling would damage the tubes. I had to chance that. The alloy was tough and they were cast in one solid piece and I didn't think that the spray would crack them. Anyway, there was nothing else we could do.

After a while I spoke into the radio.

"Right. Have Martin fetch me another tank of water."

"Does it work?" That was Klien and his voice was anxious.

"Good enough. Hurry with that water."

I started retching again just then so didn't hear what Klien said, if he said anything at all. Martin came creeping along the outside of the hull and I waited until he changed the tanks and had gone back inside.

"Start firing."

The long streamers of flame were pretty to watch but I had no time to admire them. I felt the safety line tighten as the ship moved beneath me and the nozzle of the hose wavered a little and wasted some water. I cursed, bit my lip, and steadied it with both hands. I seemed to stay there for a long time and it came as a surprise to find that the firing had stopped, the tank was empty, and the radiated heat from the near-fusing tubes was practically roasting me alive.

Even then I didn't bother. I was too sick to care and seemed to have no energy left at all. I didn't even move when I felt hands unfastening my safety line and pull me back towards the living quarters.

I recovered enough to help myself out of my suit and, after taking a drink and wiping my face, looked at my rescuer. It was Klien.

"You're a fool, Denton," he said. "A damn, stupid, crazy fool! What was the idea of staying out there during firing?"

"I wanted to cool the tubes," I said. "Did it work?"

"Yes." He seemed reluctant to admit it. "Martin tells me that we gained some velocity by throwing out the cargo and that, together with the increased thrust, has almost doubled our speed." He hesitated. "It still isn't enough though."

"No, sir."

"That doesn't mean that you're going to try that crazy stunt again, Denton."

"No, sir." I sagged a little, my stomach churning, and he caught my arm.

"You'd better lie down. I'll get the shots from the medical kit and have Martin get you some hot coffee. We'll have some gravity too, this damn nausea isn't bearable."

"Wait." I shook my head as light flashed behind my eyes. "What about cooling the tubes?"

"They can wait," snapped Klien. "I drove them to the limit and we'll have to let them cool a little before trying any more tricks. If we crack them we're sunk."

I didn't argue anymore.

I awoke streaming with perspiration and with the vague impression of having being roasted alive. For a while I just rested on the hard bunk, hard because we'd thrown out the mattresses, and tried to imagine myself neck-deep in ice-water. Either my imagination wasn't working or I wasn't in the mood because I felt no cooler. I was just getting off the bunk when the door opened and Klien walked into the cabin.

"Feeling better?"

"Not too bad." I tested my legs. They supported me so I stood up. "How are we going?"

"Same as before." He shrugged. "I fired the tubes again and we've stepped up our speed. That isn't worrying me. The heat is."

I'd guessed it. The living quarters felt like an oven and the air had a peculiar flat taste. I ran my tongue over my teeth and reached for the water.

"How long have I been asleep?"

"Two days." He checked what I was going to say with a gesture of his hand. "Relax. You were all in when we put you to bed and you needed it. I don't want a sick ajac on my ship."

"But you want a working one." I drank more water. "Did you try cooling the tubes again?"

"Of course."

"Who did the job? You?"

"Naturally."

I looked at him but didn't say anything. He stared back at me.

"I'm the oldest," he said. "Who else should do it?"

"Me."

"You were asleep."

"It's my job, sir." I deliberately reverted to the use of his title. "Have you made any calculations as to how long the air will last?"

"Only roughly. We're a little on the right side. With no smoking, cooking, unnecessary motion or talking we should be able to make it stretch a couple of weeks. I've cut down the gravity so as to reduce oxygen consumption and that helps." He made a grimace. "It won't be pleasant though, the air is beginning to taste already."

"Say a round fourteen days." I nodded. "We've used three of them already and that leaves eleven. Our speed is now more than double so we should reach Mars in less than a month. Say twenty days to radio contact and another two before they can reach us." I looked at Klien. "We've still got to increase our velocity."

"I know it." He looked worried. "It means using all the fuel but that isn't too important. When we arrive we'll be travelling a hell of a lot faster than we should be. I'm wondering whether or not the tugs will be able to stop us."

"They'll stop us." I stared at him wondering what he was getting at. "Even if they just bring us out more fuel and supplies we can manage to kill our velocity, change direction, and make a new rendevous with the planet. It'll take time, maybe a lot of time, but . . ."

I broke off because I understood what was worrying him. Not the fact that when we arrived we would be going too fast. Not even the fact that he'd had to dump his cargo and burn his return fuel, but because we might have to stay a long, long time in unshielded space.

He was thinking of his son.

Natural, of course, no man likes to see his own flesh and blood age before his time. Mars had an atmosphere and the satellites were shielded but a space ship carried no protection against the cosmic bullets. Thin protection was worse than none at all, it only gave rise to secondary particles and increased the number of hits. Walker was young—now. Klien was wondering what he would look like after maybe a year extra in space.

That wasn't all he was thinking about.

There's one calculation you can't help making when you're in a position like that. Take the days of life-expectancy. Divide them by the number of people. Take the answer and find a new average.

Four men and say twelve days air. Two men made twenty-four days. Three men eighteen. One man . . . .

Mars and safety were twenty-two days away.

Waiting for the tubes to cool was one of the worst periods of my life. Every minute which ticked past was a minute forever lost. To do us any good at all we had to have the increased velocity as soon as possible. I waited for as long as I could and then made up my mind.

"With your permission, sir," I said. "I'll go out and cool the tubes."

"Permission denied," he snapped. "You will assist me, Denton, in performing that task."

"It is my job, sir," I said stiffly. "I am the ajac on this vessel."

"And I am the captain, Mr. Denton. You will obey my orders."

It could have been ridiculous. It was something out of comic opera. It should have been a laugh. It wasn't. I struggled into my suit and Klien and I loaded the two tanks with water and air. Martin cut spin and we went outside. I led the way and lashed the tanks and was about to crawl towards the tubes when Klien stopped me.

"Orders, Denton," he snapped over the radio. "Return to the living quarters."

I didn't answer. I couldn't say what I wanted to say over the radio and I didn't want to say anything else. I returned to the control room, and, still wearing my suit, took my position before the controls.

Before me the big tube-thermometer had its hand well above zero. I watched it as Klien's voice crackled in my ear.

"Commence firing."

I hardly noticed the slight jerk. I didn't see Martin's expression or that of Walker. I was staring at the dial as if our lives depended on it, which they did, and I was thinking of Klien and what he was doing.

"Eight minutes," breathed Walker. "He's keeping down the temperature."

I said nothing but my hand tightened on the lever and I felt my muscles twitch in both my legs.

"They're getting hot." Martin sounded worried. "You think we can make it?"

I stared at the dial, watching the thin hand as it hovered on the danger-line, hovered and trembled there as if something was stopping it from climbing higher. That something was Klien with his tank of water and I tensed, ready to cut the tubes as soon as the rising hand signaled that the water had run out. I needn't have bothered.

"Cease firing."

The voice was weak and I was glad the others couldn't hear it. Gladder still that they couldn't hear the other sounds, not words, which echoed in my ear. I looked at Martin.

"Get your suit on and follow me outside. Hurry."

"Is something wrong?" Walker looked anxious. "Can I help?"

"You stay here." I almost ran towards the air-lock. "If you want to do something find out what our velocity is now."

Outside I moved as fast as I could towards the rear of the vessel. Klien was lying where I had left him, still tied to the struts leading to the rocket tubes. He didn't move as I touched him.

"Klien! Can you hear me?" I shouted, not caring what the others must have thought. Beneath his face plate I saw his eyes open and his lips move.

"What?" I stooped so that our helmets touched. "What did you say?"

"Refill the tanks and let's get this over with." His voice was a croaking whisper and he spoke as if his mouth was full of blood.

"I'll fill them." I'd forgotten Martin but he'd come up behind me. "Need any help?"

"No." I waited until he had gone and then touched helmets again. I wished that I could have switched off the radio but that was impossible. "Klien! Let me do it. You know what it means?"

"I know." Starlight glistened from his eyes and his lips moved as though he wanted to smile. "No good anyway. Finished. Let me alone." He swallowed and I felt him move beneath my hands. "Order, Denton. Get back."

"Yes, sir." I rose and went to help Martin with the tanks. We lashed them and I moved towards the tubes again to place the hose in Klien's hand. For a horrible moment I thought he was dead then he moved and I knew that I'd been anticipating. He didn't say anything and neither did I. We had been together for ten years and that is a long time. We had grown old together, literally, but when you're old you don't have much capacity for emotion. You don't argue against the inevitable either.

Back in the control room I waited for his last commands.

"Commence firing."

"Yes, sir." The lever moved beneath my hand and I stood with my eyes on the thermometer and the rest of me two hundred yards away where a man lay scant inches from the furious heart of an atomic pile. You could do that once and get away with it—if you were lucky. Do it twice and some people would call it suicide.

I wasn't one of them.

Beside me Martin breathed noisily through his mouth as he watched the thin hand climb towards the red zone. He knew what was happening but he knew better than to talk about it. Walker was there too, his young face perplexed, and I was glad that he didn't know Klien was his father. Later I might tell him, but not now. There are some things better for a man not to know.

"They're getting hot," whispered Martin. "Think we can make it?"

"We'll make it." I gripped the lever tighter, knowing that all the time I held it back I was killing my friend.

"They'll fuse," said Walker. "Denton! Maybe you'd better . . ."

"Shut up!"

"But . . ."

"Shut up, I tell you!" Anger and false temper came as a relief. "What do you know about it? What do you care? Keep your orders until you're the captain and then start praying that you'll make as good a one as Klien."

"But they'll fuse."

"Then let them fuse. Let the whole damn ship fuse. I'm fed up with the whole stinking mess!" I glared at him, conscious of my trembling hands, remembering the way he had wanted to hit the man who was saving his life, remembering a hundred little details from the past ten years.

The sound of the emergency alarm jerked me back to sanity.

I released the firing lever and the alarm died. The thermometer was flushed with angry red light and the thin hand had passed the danger level. I didn't care. Nothing mattered any more. If the tubes had fused then they had fused and that was all there was to it.

But there was still a job to be done.

"Check the velocity," I said to Walker. "You help him, Martin. I'm going outside."

"Need any help?" Martin looked at me and I shook my head.

"No. Find out if we're going to live or not."

I took my time going outside. I was hit again before I passed through the air-lock but I hardly noticed it. A few more weeks that I wasn't going to live. A little more premature aging. A few more laughs from those who didn't know about the 'grandads of space.' What did it matter now?

The tubes hadn't fused. Why they hadn't was just one of those things but, though they radiated almost pure white, they held their shape. I could feel the heat from them as I stooped over Klien and released him from his lashings. I carried him away from the pile and towards the living quarters before looking for what I expected to find.

I wasn't disappointed.

He could have died any time after giving me the order to commence firing but I wanted to think that he'd managed to last until just before the alarm went. Not that it mattered. He had died as he knew he would die and, looking down at him, I knew that he preferred it this way. Retirement, to a man who is used to the limitless universe for his horizon, is something to be dreaded.

And he had been due for retirement.

I caught hold of a strut and push him, hard. He drifted away, turning a little so that I could see the reflection of the stars from his face-plate, and I watched him go until he disappeared into the void. Then, slowly, I returned to the others.

" I've checked the velocity," said Martin as soon as I'd removed my suit. " That last burst of firing did it. We'll make it for sure." He didn't ask about Klien. Walker did that.

" He's dead," I said. " I've given him space-burial." I looked at him, knowing what was on his mind. " Quote regulations at me and I'll smash your face in. I didn't want him probed and examined and his ashes scattered on a foreign planet. He belonged to space and that's where I've sent him."

" All right, Denton," he said awkwardly. " No need to take it like that."

" No," I said. " There isn't, is there." I looked at Martin. "Start the radio signal as soon as possible and let me know when we make contact. I'll be in my cabin."

Neither of them stopped me as I walked away. I entered my cabin and shut the door and lay down on the bunk. Light flashed before my eyes as I settled back and my nerves twitched to pain. It didn't matter. We were safe—thanks to Klien. We had air to breathe—thanks to Klien. We could go on and I'd be retired and spend what was left of my life gabbing with a lot of old has-beens—thanks to Klien.

I envied him with all my heart.

Alan Guthrie.

New York's World Convention

The 14th World Science Fiction Convention will be held at the Hotel Biltmore in New York on September 1st, 2nd and 3rd this year and will have Britain's leading author-scientist Arthur C. Clarke as Guest of Honour. More than 1,000 delegates are expected to attend what looks like being the most fabulous Convention yet inaugurated.

Readers wishing to take out Convention Membership (entitling them to all literature) should send $2.00 to The Convention Secretary, Box 272, Radio City Station, New York 19, New York, U.S.A.

We have published several articles concerning computing machines but this is a subject which needs continually bringing up to date. This month John Newman discusses the vast possibilities of computers in industry and office.

COMPUTERS DON'T CARE

By John Newman

An office is essentially a memory unit where information is stored and processed and, as such, is one of the most outdated industrial units in a technical civilisation. Millions of clerks are needed to carry out the simple but continual calculations and filing of information, whether it be numerical or alphabetical. It is not surprising that an enormous amount of effort is going into the development of electronic and mechanical methods to completely eliminate the need for clerks in many offices.

It is not generally known that these efforts have been successful and that digital computers have replaced office staff both in this country and in the U.S.A. And that it will not be long before most large firms will be faced with the problem of whether or not to use electronic computers to save labour costs. So far, their social impact has been softened by their high initial cost and the need for trained men to service and run them but these two points are now being overcome by the renting of machines and by training schemes run by computer manufacturers.

The change-over from clerks to computers means as large a reorganisation as that from hand production to machine production but more and more firms are jumping onto the band wagon, particularly in the U.S.A. It seems certain that, slumps excluded, computers are

the one thing that can free enough non-productive workers to fill the many industrial jobs that are now vacant.

The progress of Leo, the Lyons Electronic Office, gives a good idea of how much has been done during the last few uears. This setup was designed starting from scratch and Leo I was first put into operation in 1953, using a completely reorganised office procedure. Even though this was an experimental model the results were revolutionary. Straight away it did the payroll calculations and printed them for 1,500 employees and this has now been expanded to cover the payroll of 7,000 workers, the computer doing the work of 27 clerks. The next step is for it to run off the payroll for a group of 15,000 employees each week, this taking it about six hours. In addition, it is already handling the daily orders for 150 teashops including information on production, assembly, packing, cost accounting and managerial statistics. Its accuracy is higher than that of clerical staff, and it needs only a small group of personnel to run it.

From Leo I, Lyons went on to develop Leo II, a computer four times as fast as their first model and one which they are prepared to manufacture and sell for around £75,000. The use of such a computer is expected to give a large office a net saving of £100,000 a year. The service that they offer is pretty comprehensive—research into the use of a computer in a customer's office, trial runs on Leo II using the purchaser's methods and, finally, tuition of the purchaser's staff in the operation and maintenance of the computer. For smaller firms, Lyons are prepared to carry out calculations as a regular service on a fee basis.

Other computer manufacturers are now offering similar types of services—the automatic office is already here.

And IBM, the International Business Machines Corporation, is now offering for sale computers using transistors instead of vacuum tubes.

The limiting factor of computers seems now to be in the memory units and it is in this field that most of the research and advances have been carried out during the last few years. The problem is such that computers have to have three types of memory, each serving a particular purpose that cannot be duplicated by one of the other methods.

There is a striking similarity between the older methods of storing information and those methods that are their computer counterparts. The use of inscribed stone or clay tablets can be compared to punched cards or tape and both have the same disadvantages; they are slow

and need a comparatively large amount of storage space. The shape of papyrus scrolls, with only two edges exposed to the air, was made necessary by the brittleness of papyrus sheets and is similar to magnetic tapes such as are also used in sound recording. The invention of parchment was the next great step forward, for tough sheets of it were soon bound into book form, the codex of the ancient world. It was originally designed as a filing system so that pages could be removed and replaced as laws were altered, thus having the advantages of permanence and erasibility. Speed came with the invention of the printing press and the linotype.

We are still looking for the electronic equivalent of a book for here it is that the greatest weakness of computers lies, in the large scale storage of information. This, the first type of computer memory, should ideally be extremely compact and cheap because of the millions of words that must be stored. It should also be permanent but errors must be easily removed and new information substituted without too much trouble. Any data must be available from it in a matter of a few minutes, including the search and the transcribing. No known method fulfils all these requirements—punched cards and tapes are bulky, slow and difficult to correct. Punched cards can only be read at about 20,000 words a minute but they have been in use for 25 years and they are efficient at sorting large masses of information. Magnetic tape is the current favourite method, the information being stored as a series of magnetised spots on the tape. It is fairly fast and compact but cannot be easily corrected.

Several channels can be recorded on one tape so that a single reel of 35 mm. multichannel tape can store 300,000 words, access to any word being obtained in a maximum of six minutes. This is equivalent to the capacity of 18,000 punched cards.

A photographic method has been recently developed and it looks as if it is going to supercede both punched cards and magnetic tape for it has only one fault, it is difficult to erase and correct. The information is stored as a series of black dots on discs of film. The dots are actually rectangles one thousandth of an inch wide and three thousandths of an inch long and they are arranged in circles on the disc so that they can be quickly scanned by a beam of light moving from track to track as the film is rapidly spun. One disc with a diameter of sixteen inches can store about twenty million words in the outer four inches and any single item of information can be located in less than 25 thousandths of a second. Using it, the entire contents of the Library of Congress could be stored in four shoe boxes. If errors are made the mistakes can be left in place and new, corrected information added without taking up much more space.

The large scale storage of information is more important for office machines as they handle a large number of variables and large amounts of data requiring little calculations whilst the scientific computers perform a large number of calculations on a small amount of data and thus do not need very large memories.

The second type of computer memory is the intermediate one where information and instructions are stored whilst the computer is actually in operation. Here, it is important that the information should be quickly available and easily erased. Even when particular items of information can be found in about 20 thousandths of a second this is still a thousand times slower than the calculating speed of a computer. Most computers use a magnetic drum storage system for this memory —a cylinder coated with the same material as a magnetic tape rotates at high speed under 'heads' that magnetise spots on its surface in lines some tenth of an inch apart. About 10,000 to 100,000 words can be stored on a drum but several drums can be linked up to one computer. The drawbacks are that the cost is high and quite complicated electronic circuits are needed, as well as it having a comparatively high delay time. One way of getting round the problem is to use magnetic core memories such as are now being used for the third type of memory, the inner one. Here, it is the cost that has to be overcome but, if it can be done, it will mean the fusing of two of the memories into one unit with a tremendous saving in both time and complexity.

The intermediate memory stores the results of calculations and the new instructions so that it is comparable with a rough note book rather than with the memory of the brain.

The inner memory only stores information that is actually being used and any part of it must be very quickly available as well as being quickly erased. Because of the necessary speed only a few words are stored, usually about 1000 to 7000 (ENIAC, the first digital computer, had an inner memory that could only store 27 words). The earliest method used vacuum tubes, one for each word, but these were so expensive that many other systems have been devised.

Sound travels very much slower than electricity and, by a recycling process, information can be stored in the ultrasonic waves passing through a bar of metal or a tube of mercury. This type, known as a delay tube, has been used in a large number of computers but it is expensive and the information is not available for the greater part of the time whilst it is in the form of ultrasonic waves. UNIVAC uses a hundred of these tubes giving a total inner store of 2,800 English words. Then cathode ray tubes were used, the information being

stored as a series of charged dots on the surface of the screens and read by the electron emission when a beam of electrons was directed to it. The method is very fast, about 12 millionths of a second being needed to read any particular item, but it is far too erratic. Even small outside disturbances completely upset the memory.

Now, IBM and other firms are producing a new system, the magnetic core memory. Tiny rings of a magnetic material are strung on a network of wires through which magnetising and reading pulses can be sent. Each ring is traversed by four wires, two to energise and two to read each core. The direction of the magnetic north pole of each ring can be 'up' or 'down' corresponding to the 0 and 1 of the binary code. This method is simple, fast, unaffected by outside disturbances and gives strong signals. It is already being used by IBM in their 608 computer where, combined with transistors, not a single vacuum tube is used so that power requirements are cut by 90 per cent as well as giving greater reliability.

Solving the problem of computer memories is only half the battle. Even with memories operating at the same speed as the calculating units there is still the problem of translating from the 10 numbers, 26 letters and a wide range of punctuation and mathematical symbols of English into the binary code and back again.

Taking the hindmost part first, translating from the machine language into English can be done simply by using high speed automatic typewriters or high speed printers connected up to the intermediate or large scale memory units. High speed printers can transcribe from magnetic tape at 72,000 characters a minute whilst 18,000 characters a minute can be typed from punched cards.

The hold-up lies in the translation from human to machine language. As yet, there is no machine to do the work and an operator must type out the information. Punched cards have to be punched and magnetic tape has to be filled but it is not necessary for the operator to know the code. A typewriter keyboard can be used so that typing a normal number or letter automatically transposes to the binary system on tapes or cards. But the speed of conversion is limited by the speed of the typist. Probably there will be an extension of the use of the binary code to everyday accounting so that pay slips, account cards and order and delivery notes will be printed in both languages so that they can be directly fed into the machines. Other conversions, such as from punched cards to tape or from tape to punched cards (at 240 and 500 cards a minute respectively), can be carried out automatically.

The cost of running a computer is divided between the cost of buying and maintaining the equipment and the cost of the staff needed to

programme and run it. Firms using computers don't need a staff of electronic engineers and only a small amount of skill is needed to actually operate the machines—loading cards and tapes, altering the controls, removing the results and watching for errors. The greatest skill is required in the computermen, the qualified people needed for translating the problems into the programme sequence. The senior programmers of large firms will need a good mathematical background and must be able to understand the limitations of computers and the scope of the problems to be handled. It is best if he is an engineer who has become a computerman. But there is no need for small firms to employ a full-time computer specialist—if you use a radio set you don't keep a full-time electronic engineer, you only need to be able to call one in if things go wrong.

There are already fifteen firms in the U.S.A. and eleven in this country engaged in the manufacture of computers but only two of them produce the larger types costing about £100,000. These include Remington Rand's UNIVAC and IBM's 702.

General Electric in the U.S.A. built their new offices round a UNIVAC computer—and are designing all their office procedures to fit it. The method used was to gradually shift job after job onto it, starting with pay calculations on magnetic tape. Then routine clerical work such as cost distribution and inventory control followed by preparation of sales records and printing of bills until, finally, all accounting work and regional sales analysis were carried out by it.

But the smaller computers have an enormous range of uses and will continue to be used by a large number of firms.

One hint of a more general, future use for computers is in the combination of their data processing and controlling abilities with control by spoken commands. Bell Telephone Laboratories have built a computer known as " Audrey " that can not only recognise spoken numbers but can understand and act on spoken words and phrases and even speak the answer to questions. Just as offices are being built round computers so we may yet see houses designed round them. A voice-actuated, central computer could control doors, windows, cooking, heating, lighting, cleaning, time keeping and typing with the memory unit acting as a library, record collection, reminder pad, automatic telephonist and selector of radio and television items throughout the day.

In fact, do everything but *live* in the house.

John Newman.

Contributors to New Worlds *are beginning to take on an International status, which is in keeping with our readership. This month we introduce an Australian author whose popularity is steadily rising both in his own country and in America. You can look forward to more stories from him soon.*

PLACE OF THE THROWING STICK

By Frank Bryning

Munyarra had his first sight of the monster he had come to slay when the creature's pointed snout, beyond the horizon, flashed back the light of the setting sun.

Instantly he dropped flat amongst the dry grass tussocks. His exultation at having run his quarry to earth at last was held in check by his instinct for caution if he were to take the monster unawares. So he lay without moving a finger or toe until the gleam of light—from the monster's eye, no doubt—died away, and darkness came.

When he did arise his naked black body was invisible in the night. Without hesitation he set off, to travel in a great half-circle until he was due east of the monster's position, and still beyond its horizon. There, in a shallow depression, he laid down his great war boomerang (which could break a man's leg) his two light hunting spears, and his deadly shovel-nosed spear. With his spears he laid also his woomera, or throwing stick, notched at one end like a crochet hook to take the haft of a spear, and so add its length and leverage to his throwing arm. From his waistband he released the corpse of a thirty-inch bearded dragon, encountered early in the afternoon, which would provide his meal.

With bare hands he scooped a meagre trench in the dust and set his economical blackfellow's fire with a few handsful of dry saltbush twigs. He made fire by twirling a stick between his palms in a cleft in a small piece of wood held by his great toes. Then he transferred a smouldering wad of shredded grass to the sticks and breathed them into flame.

His meal of broiled lizard finished, Munyarra lengthened his fire trench a few feet and spread the glowing coals along it. When they had become grey ashes he scooped them out, took their place on the heated earth, and slept.

In little more than thirty days Munyarra had travelled on foot thirteen hundred miles from his home territory between the Timor Sea and the Gulf of Carpentaria. He had come to where, according to smoke signal, "yabba-stick," and word of mouth, white men were making powerful magic with a monster that flew through the air like a spear with a haft of fire, and roared with a voice of thunder.

In him, *allatunga*—head man—of the *Warraimulluk*, his tribe's mightiest warrior and hunter, the blood of his fighting ancestors had stirred. Time had come again for a man to do as the mighty Grungrunja had done in the days of the Old Ones.

The songmakers of many tribes still chanted the defeat of the white man's horned monsters by Grungrunja, *allatunja* of the *Arunta* people, and greatest warrior of *his* day, though his left arm was but a stump at the elbow. Even the songmakers of the white people had made a "paper-yabba" of the story,* Munyarra had been told. For Grungrunja alone, and with his one mighty arm, had driven back the first white men to invade *Arunta* territory with their herds of bellowing, horned monsters which ate out the grass and starved the timid kangaroos and small game upon which the black man lived.

In the generations which followed, by force of numbers and their terrible weapons, the white men and their herds had taken all the country. Until, at last, in shame, the white men's own tribal councils had forbidden them that most northern peninsula in which the *Warraimulluk* and neighbouring tribes still lived in the ancient ways. And there the blood of old and young alike still quickened at the song of Grungrunja's victory.

Grungrunja, armed for battle, had been on the trail of a marauder from the south. He was close upon his quarry in the territory of the *Dieri* when he ran into the first herd of cattle he had ever seen, coming straight at him through the scrub and trampling the trail he was follow-

* "Desert Saga" by William Hatfield, to whom the episode retold here is gratefully acknowledged.——F.B.

ing. In a haze of dust, with a menacing, many-throated lowing, armed with a myriad spears which sprouted two-by-two from their heads, they came on at walking pace.

From behind the herd Grungrunja could hear the frequent crack of a stockwhip, and over the tossing head-spears and undulating backs of the monsters he could see the ridiculously adorned and headgeared white men on horseback.

Mounted white men he had seen before, from a distance. Several of his fellow spearmen had been slain, and he had lost his left forearm by the sting of the shrieking bees launched against them by throwing-sticks that merely pointed, puffed smoke, and cried " crack !" like the sounds he could now hear beyond the monsters.

Grungrunja found that the herd had already outflanked him. He would have to flee across open ground in full sight of the leading monster—a huge, long-horned steer—and, no doubt, also of the shrieking bees whose sting was death.

Flight was his only chance, he knew. But his bush lore told him that as soon as he moved and became visible, running, he would be pursued. So that same lore bade him take desperate advantage of surprise and momentary, feigned attack.

From the shadow of a clump of *mulga* Grungrunja threw his heavy war boomerang with all his strength. Then sweeping up his spears he leapt into full view—his three and a half limbs spreadeagled in the air—and yelled his blood-curdling battle challenge.

The boomerang gouged out the leading bullock's left eye and tore the left horn from its head at the moment Grungrunja's cry made the air quiver. Bellowing, the beast reared up, swung round on to the horns of the one behind him, and charged back into the mob. In twenty seconds the entire herd, lowing and milling, was working up to stampeding speed, back the way it had come, with the white men in pursuit.

Grungrunja, already in full flight in the opposite direction, had been astonished to find himself the victor. He stopped to see the havoc he had wrought, until cattle and horsemen had disappeared. He retrieved his boomerang—and picked up the bullock's horn, which had remained with his tribe as a potent magic long after the spirit of Grungrunja had entered his totem brother, the *brolga*, to soar freely for ever on slate-grey wings . . .

Munyarra was of the *brolga* totem in his own tribe, as Grungrunja had been in his. He had often fed upon the wild descendents of the white man's cattle, and he knew they were not so fearsome as they had first appeared to his people. Now he was deliberately stalking the newest monster of the white man, to prove it, likewise, vulnerable.

This creature, the bushland intelligence had informed him, possessed only one horn—albeit a mighty one. Indeed, it was said that its horn and its body were all one.. And it had four wings which it used either to fly with or to stand upon, upright and motionless like a bearded dragon on its hind legs and tail, simulating a sapling stump or a branch on a fallen log.

So Munyarra had journeyed south across the dry " dead heart " of Australia, from Arnhem Land in the north, bearing the flint-tipped and fire-hardened wooden weapons of a bygone age. He came to do battle with the leader of the white man's new herd of monsters before they could encroach on the last remaining territory of his people . . .

He had passed in friendship through the lands of the *Mangari*, the *Anula*, the *Binbinga*, and the *Warramunga*. In that lush Gulf country he had fared well on flesh and fowl and fish, on water-lily roots and wild honey—all taken " on the run " without deviation from his course.

Unseen by any white man, and by few if any black men of the Centre, he had come one evening to the little town of Alice Springs, and had marvelled at the immensity of the white man's " camp." That night he had gazed in wonder at the unwinking, brilliant fire the white man used to light his square-windowed *gunyahs* and the broad, straight trails through his camp.

By night he skirted the little town, and in Grungrunja's *Arunta* territory, now gameless cattle country whose one-time warriors' bush-craft had become the craft of horse and cattle men—and beggar-men —he slipped like a wraith beneath the Overland Telegraph line.

Then he came upon the railway. All that night he skirted the end-less, snake-like rails of the single track, making many tentative ap-proaches, until the dawn. In the early light he screwed up his courage and hurdled the rails in one prodigious leap.

That same eventful day, during an interval when no dust cloud from the white man's whining monsters that ran without legs could be seen from horizon to horizon, he flitted across the transcontinental motor road.

So he entered the depopulated *Aluridja* country to the west of salt-crusted, bone-dry Lake Eyre. South and east he kept on through the no less deserted *Arabana* and *Wailpi* lands, toward the monster's lair.

Through the desert he had fared, not sumptuously but adequately, on lizards and snakes, and an occasional rabbit or kangaroo-rat. Those who eat reptiles do not grow fat, but the bushman knows they nourish. And all the way Munyarra had been heartened by the frequent sight of his totem brother, the big, crane-like *brolga*, or " native companion" as the white men call him. In one of these, sooner or later, Munyarra knew, his own spirit would reside for ever—even as that of the great Grungrunja.

Thus he had come at last, in good, lean, fighting fettle, and unobserved by men, by instruments, or by patrol aircraft, to the place where the white men flew and tended their roaring monsters—the place the white men had named with a blackfellow—*Woomera*, the place of the throwing-stick . . .

At dawn Munyarra lay concealed in a shallow trough behind a tussock only seventy yards from the monster. He had left his camp in the night, bearing only his war boomerang, his shovel-nosed spear, and his *woomera*. He had stalked the monster from behind—where, he had observed early, there was no eye on its smooth, shining skin.

Despite its size the monster was a stupid thing, for it had taken no advantage of the dark to conceal itself. It had stood starkly amidst the brightest fires Munyarra had ever seen—some fixed on the ground, some carried around by the whining lesser monsters on which the white men rode—and all incredibly bright and unflickering. In all this light, for some hours, Munyarra had studied his adversary.

Like the horn of a bullock—like the point of a spear, broken off—it stood on its four legs which were also wings. Unmoving, it was, but none-the-less alert—truly as a shamming lizard might stand. He was not fooled by its immobility, although he was appalled by its size.

He could not, he realised, strike at its head, as Grungrunja had done, to knock off the single horn surmounting it. Thrown from below, a boomerang could only glance off the horn without damaging it. A throw from farther back, to strike across the point, would be impossible.

But Munyarra had discerned a more vulnerable place—the monster's groin—the place where, beneath the lizard-like body, the four wing-legs came together. His estimate of the vital nature of this region was confirmed by his observation of the care with which many of the men serving the monster ministered to the orifice he discerned there. There, he felt, was the place to strike. There, even if his hard-thrown boomerang failed to kill, it must surely maim and cripple . . .

With the rising sun behind him Munyarra watched the servants of the monster withdraw in their whining, wheeled beasts, leaving it alone on the desert while they went inside their low stone *gunyahs* in the distance beyond.

Five minutes longer he lay watching. Then, weapons in hand, he crept stealthily to within thirty yards . . . Beneath the monster he could see the vital orifice, a wide ellipse now, with thin, fin-shaped appendages . . .

Leaving spear and throwing-stick at his feet, Munyarra straightened up, boomerang in his left hand.

Unknown to him, one of the servants of the monster, in the reinforced concrete "*gunyah*" a quarter-mile away, was chanting . . . "—eighteen — seventeen — sixteen — "

Balancing on the balls of his feet, Munyarra took the boomerang with his right hand, hefted it, swung it across in front of his knees, and then back for the throw.

"— seven — six — five — four —" chanted the monster's servant.

The heavy war boomerang left Munyarra's hand below chest height, swooped, spinning, down to knee level, then swung suddenly upward between the two nearer legs of the monster.

Straight up into the orifice it went, to clatter against the fin-like appendages, buckling one and remaining there, jammed between them . . .

Neither cry of pain nor quiver of movement came from the monster. Munyarra who had swept up spear and throwing-stick as he recovered from the throw, felt a pang of chagrin at his failure.

But even as he puzzled the monster roared—and belched fire from his bowels !

For an instant Munyarra knew a wild ecstasy at the thought that he had rent the monster asunder. Then the hot blast of flame seared him like a thousand camp fires, and in an instant singed off his sparse beard and the hair of his head and body. The roaring of the monster rose to a howling scream that tortured his eardrums, made his bones ache and vibrate, and the earth beneath him to quake. Beneath his upraised, eye-shielding arm Munyarra saw the monster lift all four feet off the ground at once—and leap into the air !

He fled . . . The monster screamed and howled—behind him at first . . . then from above.

Snatching a terrified glance upwards Munyarra saw the monster in flight, truly a spear with a haft of fire, and still screaming shrilly.

He ran on, but a change in the voice from the sky made him look again. Higher yet, still riding its flaming tail, the monster was weaving its nose about in ever-widening circles—plainly seeking its attacker. Munyarra stopped in his tracks, so not to attract attention by his movement.

Too late ! The circling, questing nose came down. The fiery tail came up like that of a charging crocodile. The monster was coming his way !

Munyarra knew he must stand and fight. Spear haft found the notch of his *woomera* as he took his stance. He would throw as soon

as his enemy should come into range. Then, as he was skilled in doing, he would leap aside at the last moment, just too late for the other's aim to change.

Yet all Munyarra's skill in the manoeuvre of evading spears had never given him experience in evading a missile flying faster every second and every yard from the moment it was launched towards him. The muscles of his throwing arm had barely tightened . . . his *woomera* had driven the spear haft a mere four inches while the monster travelled the last fifty yards . . .

There was a blinding flash of light and an earth-shaking detonation. There followed two secondary explosions and a leaping fire. The rocket range technicians swarmed like ants from their reinforced concrete bunkers, climbed into fire-fighting vehicles, and headed for the pillar of fire and smoke.

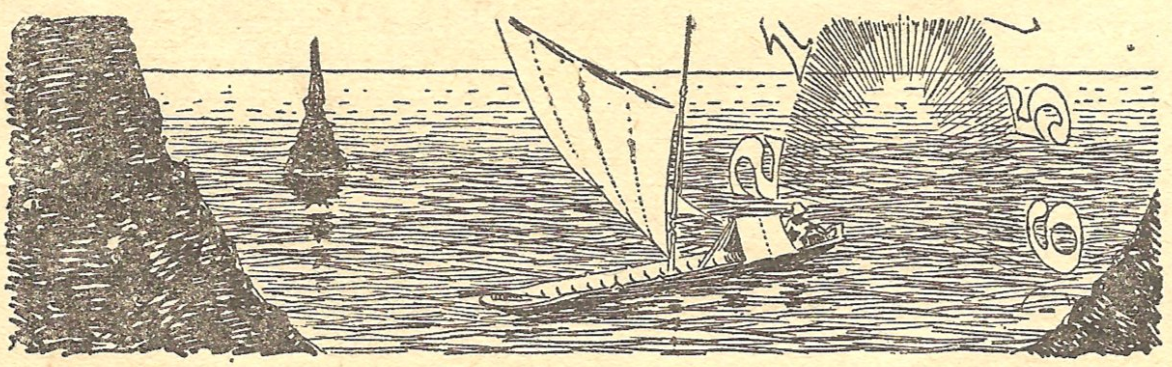
A jeep peeled off to approach the scorched take-off area. Two men got down from it to investigate a small yellow flame which flickered on the ground.

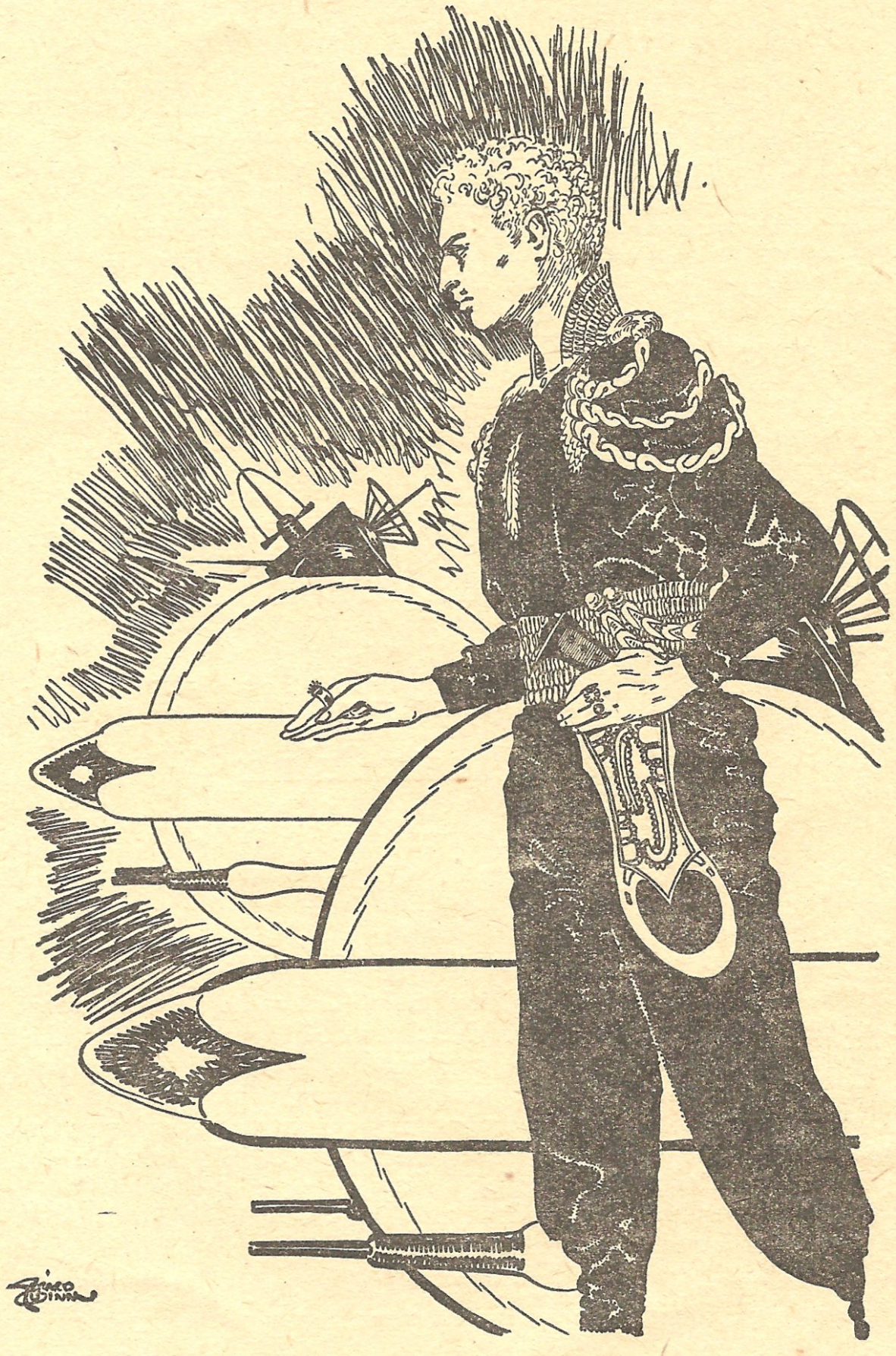
" Good God Almighty !" swore one, as he stamped out the flames and turned over with his boot the charred bent object. " A boomerang ! What do you suppose . . . . ? "

The other did not reply. Both stared in puzzlement across to the burning rocket.

Beyond the smoke a *brolga* spread its six feet of slaty wings upon the air and swung away towards the north.

Frank Bryning.





In the January issue our science writer John Newman had an article concerning bacteria and their effect upon living cultures. It is possible that the article had considerable influence upon Mr. Bulmer's story—especially as both writers are close friends and write jointly under the name of "Kenneth Johns."

THE SMALLEST ALLY

By Kenneth Bulmer

Illustrated by QUINN

The Starborn wanted the Terrans alive.

The Terran Interplanetary Patrol Ship *Castor* was eleven hundred feet long, with a modified stardrive that would operate safely within a planetary system, twenty five weapons turrets and a semi-automatic control framework that was a triumph of human ingenuity and skill. She was the epitome of interplanetary transportation and fighting needs and their solution balanced by planning and economy. She also carried a crew of two hundred and sixty three men and women.

Castor never knew what happened. Her screens remained blank, her radar beamed imperturbably, no alarms so much as shivered. The Starborn pounced out of space and gulped *Castor* into a small airlock high up on one fin like a fish taking a fly. The vital thing

was, from the viewpoint of the Starborn, that they wanted the Earth people *alive*.

Captain Andrew Jenkins, TSN, glared across his control room from his command chair and said blankly :

" I don't believe it."

Jenkins was a robust, compact man with the glitter of the stars in his eyes and a twisted left foot, about which he was self-conscious and too fond of joking, referring to it as his ' Achilles Heel.' He'd got it when *Achilles*, Interstellar cruiser out of Mars had blown off Centaurus.

" Where the hell are we, anyway ?" He pushed forward and stared at the grey and lifeless screens.

Around him in the control room the duty personnel were being rapidly augmented by off-watch officers crowding in. There was a lot of high-pitched talking going on; but no-one had the answer to the Captain's query.

Timmins, the Astrogating Officer, laughed nervously.

" We should be on the Pluto-Titan orbit, just about to cut the orbit of Neptune—"

Jenkins looked at him. The Astrogating Officer fell silent, a dry feeling of ineptness clogging his mouth. Everyone in the room looked away from the screens and their attention on the Captain was like a physical weight. Timmins always managed to say the right things at the wrong time. Everyone knew where *Castor* should be: on the way to Interplanetary Base Twelve on Titan, pulled in from patrol in accordance with Naval orders respecting the truce with the Starborn. If you could call a logical and pre-arranged meeting without any bloodshed between two alien races a truce, that was.

Lieutenant-Commander Rawson, Guns, looked back at the dull, featureless screens and swallowed. " Interplanetary dust," he said hesitantly. " An exceptionally thick dispersal—"

" That idea won't wash." Commander Purkinje stated positively. Purkinje was *Castor's* Exec and given to snap judgements. " Those screens are functioning perfectly, yet they show just nothing. If it was dust there'd be movement, a flicker, possibly a star or two shining through temporary gaps."

" Well—" Rawson pushed his visored cap up. " We must be somewhere." His classically chiselled features were alive with conflicting emotions.

" A commendable comment." Captain Jenkins jerked his bullet head at the Communications officer. " Report please, Mr. Jukes."

Lieutenant-Commander Daniel Jukes stuttered in his eagerness to get his report out in one lump. He had a wide, rosy face, the extreme width further accentuated by ears which projected almost at right

angles. His shipmates were fond of kidding him that special space helmets had to be built for him. His knowledge of spatial communications was probably unrivalled this side of Jupiter.

" Everything working one hundred percent, sir. No signals coming in or going out. When the greyness appeared on the screens a message in course of transmission from Mars was cut off. No distortion or fading, just a clean break."

Which didn't help Captain Jenkins very much. He thanked Jukes, then swung on a petty officer.

" Crew up the searchlights. Let me know when they are ready to operate."

" Aye, aye, sir." The petty officer saluted before passing on the order. Captain Jenkins liked *snap*.

Purkinje's dark face screwed up into a frown. " You think we can spotlight whatever the phenomenon is, sir ?" the exec asked carefully.

" Possibly. Whatever it is, standing here talking about it won't solve anything." Captain Jenkin's voice, startlingly full of volume for his short figure, rose, and he leaned back on his right foot, letting his twisted left foot swing meaningfully. " It is only necessary for duty personnel to be in the control room," he snapped.

Magically, the control room cleared, off duty officers scuttling like so many picadors being chased by a bull. Captain Jenkins went back to the screens. A wall speaker coughed and said: " Outside spots ready, sir."

" Illuminate," Jenkins said.

The screens remained dull, grey and blank. Jenkins knew that mounted on the hull of *Castor* fifty searchlights of six thousand or so candlepower each were throwing a deluge of light outwards. For all the effect that he could see they might as well be burning a child's nightlight.

Before he could even start to think what he should do next, he became aware of the Astrogator arguing fiercely with the two Quartermasters, their voices gradually rising as they forgot their whereabouts in the intensity of professional dispute. Jenkins listened for a moment and then said icily: " May I join your discussion, gentlemen ?"

The three men stopped talking together, as though their three heads had been compounded into a single mass, and Timmins flushed nervously, as though he were still a small boy being rebuked by a senior.

" Please report, Mr. Timmins," the Captain said frostily. There was a twitch to his compressed lips when he had finished speaking,

although that was completely lost on young Lieutenant-Commander Alfred Timmins.

" All equipment working at one hundred percent, sir. But—but the readings we get suggest we are still following our original course, with an added vector which we think is taking us ninety degrees—"

" Which you *think* ?" Jenkins felt surprise.

" I'm afraid so, sir. We can't be sure. There also seems to be a modulating frequency coming from somewhere that our instruments are computing into their records. It's a bit of a mess, sir." Timmins finished haltingly.

" So I see." The Captain kept on his face the habitual mask of command. If that cracked—God ! It didn't bear any contemplation whatsoever. " I think we can disregard any evidence given to us by the instruments." He was addressing all of them now, and the duty officers waited on his words, and on his judgement of the situation and whatever orders he might see fit to give.

" Open up a direct view port, please," the Captain said at last, mildly.

All faces remained politely blank. No-one wished to mention that opening the direct vision ports in space was strictly against regulations drawn up for fighting vessels. They all knew—their captain best of all—that the situation they were now in was not one likely to be found under any regulation—or, for that matter, in any previous experience of any one of them.

The tough metal rings were swung back, the clamps undogged, and then a brawny petty officer jammed a steel claw under the dead-light and forced it back. The circle of triply reinforced glassite reflected the lights in the control room brilliantly. Outside nothing could be seen.

" Douse the lights." Hard on Jenkin's order all the lights in the room, save those over the flight instruments, ceased burning. Through the circle of blackness there came a wavering flicker, then a stronger glare, then a return to a ghostly orange glow.

" That's the reflection of the searchlights !" The exec blurted that without thinking. He moved back respectfully to allow the Captain to move forward onto tiptoe and peer through the port.

Captain Jenkins drew in his breath with a sharp gasp. What he was looking at could only be the fabric of a nightmare. Curving around him, intermittently illuminated by the roving searchlights from *Castor*, a complex tracery of girders and piping faced by smooth expanses of metal held his ship like a train in an underground station. He flicked a hand impatiently and growled an order and a searchlight held steadily on the section directly opposite the vision port. There

could be no mistaking it. *Castor* was entombed in a vast cavern of metal. His mind shied away from the corpse in the grave concept; but not quickly enough to prevent an involuntary tremor from passing through his body. He twisted his head round, peered upwards. The cage completely encircled the ship as far as he could see.

There was only one answer to that particular problem.

It seemed to him ages before the party had been equipped with spacesuits, handlamps and weapons, and yet, when he was standing at the head of the small body of men in the airlock, the time seemed to have gone so fast that he still hadn't sorted out his emotions. He knew there was an undercurrent of fear pulsing in his mind; but that was overlaid by the imperative urge to find out just what all this was about. This sort of thing just didn't happen.

The cycling lamp changed from red to orange, then stayed a sickly yellow. Lock empty. The outer valve opened and he went through, favouring his foot, his whole attention concentrated on the impossible vista outside. Juke's voice from the rear drew half his attention.

"Cycling light's changed back to orange, sir. Some atmosphere here."

"Get Macpherson to check on it," Jenkins said, and strode forward.

His outside pickups relayed a thin, tinny echo at each footfall. His handlamp played across a dark space, shone back from smooth metal composing the walls of this giant incubator. *Castor* was eleven hundred feet long. That made this cavern something like thirteen hundred, he judged, stepping gingerly down the extruded ramp; a truly fantastic size for the *interior* of a man-made object.

But then, almost inevitably, it wouldn't be man-made.

Around about that time Captain Jenkins began to have the first faint glimmerings of just what it was he was caught up in and of what possibly he and his crew might be called upon to face in the near future. The prospect sickened him.

"We thought they were genuine, ready for fair dealing," he said to himself, his voice a barely audible bumble over the intercom. "And then this. Lord knows the repercussions that'll happen now. When Earth hears about this, they," . . ." He stopped then, struck by a deadly flaw in that line of reasoning.

Rawson's voice came over his phones.

"Covering you, skipper. Nothing stirring yet."

"Very good, Mr. Rawson. Don't fire until I give you the word." Rawson was at his command post, his nose pressed against a freshly opened viewport, talking into a hand-set, the whole colossal fire power of twenty-five energy weapons at his fingertips.

" Aye, aye, sir," he said, his voice taut.

As the communications were not functioning, the Communications officer had accompanied the captain outside. Lieutenant-Commander Daniel Jukes was not happy. His world revolved around his beloved equipment, through it he kept in contact with the planets, with the warm, human, reliable worlds of other people, wherever they might be in the slice of the Galaxy so far peeled off by adventurers from Earth. Tcharandsky, the psychologist-officer, might analyse that love for his equipment as a distorted Oedipus complex, acting on Jukes' need for care and affection and the reassuring feeling of other people in the mass. Whatever the reason might have been, finding himself outside the ship in a strange and completely unfamiliar environment was too much for Daniel Jukes to stomach.

He tried to hold it in. He tried desperately to freeze his jaw muscles. But all self-control had vanished, all self-contempt. He forgot that he was a man, a hardened spaceman, and the black tide of fear rushed in to overwhelm him.

Captain Jenkins caught the first guttural sounds in his phones. By the time he had identified them as coming from Jukes, the communications officer was screaming, his eyes white under his helmet in the reflected glow. Jenkins snapped a hand at two crewmen in the party. Jukes was scientifically pinioned, then whirled around and carried forcibly back up the ramp and into the blessed haven of the ship.

As soon as the inner valves opened, Jukes stopped screaming.

Captain Jenkins pushed his forehead against the sweat band of his helmet, removing his bodily reactions to that moment of nausea. That had not been nice. His face grew grimmer. Doggedly, he went on down the ramp, stood on the alien metal with his feet planted arrogantly apart, and stared into the lamp-shot darkness as though to challenge whatever demons dwelt in this cavern between the stars.

Shockingly, as though in answer and derision of that challenge, a voice clanged at them from the roof.

" Earthmen. You will not be harmed—if you obey orders. There is atmosphere in this ship which will sustain your life. You will all leave your ship and follow the robot sent to fetch you."

The small party of Earthmen halted, not moving, their eyes searching the shadows for the origin of the voice. Jenkins ignored the concept implicit in the use of the word ' ship ' in describing this cavern. Captain Jenkins was Navy. Real Navy, unlike most of his crew who had been swept up in the sudden expansion consequent upon the first contact with the Starborn. They were, to put it crudely, just a bunch of amateurs. Like Jukes, for instance. Lieutenant-Commander—

just a jumped-up radio announcer. But Jenkins was true-blue Space Navy, with the discipline and habits of obedience of twenty-five years ingrained into him. He was used to taking orders—from his superiors, men set in authority over him. As a result he was peculiarly reluctant to take orders from anyone he didn't know. He cocked his head back in the space helmet.

" Who are you ?" he barked.

" It is of no consequence whether you know or not," the answer came thin in his pickups. " No harm will come to you. You will all leave your ship, now."

There really wasn't much he could do, standing defenceless like that on the ramp. Slowly, he began to retreat, waving the party to precede him. His eyes narrowed.

" I cannot accede to your request until I know who you are." His speaker sounded even thinner to his ears than the alien voice, giving him two facts. The air was considerably lower than Earth normal pressure and the alien was using a high-power speaker. He glanced into his helmet mirror. Only three more men to return and then him.

The alien speaker crackled as though a new voice had taken over, disturbing the connections.

" Earthmen, I repeat, you will come to no harm. This order comes to you from Kal-hajlan, Commodore in command of the Twenty first squadron of the Starborn. Leave your ship at once."

So it was the Starborn !

Men had already questioned the aliens' use of the term *Starborn*: but had shrugged it off. It might indicate overweening confidence and pride, or be just an expression of the feelings the aliens had for their star destiny. Either way, Terrans had argued, it didn't matter. What would matter would be ships and men, fighting capacity and sheer raw courage. Afterwards, when first contacts had been amicably made, of course, the outcome of this meeting between races would be decided in the council chamber and the debates of delegates in the artificial world being created in the dead spot between suns. Somewhere out beyond Sirius, the council world was being built. Men and Starborn, working peacefully together, co-operating to set-up a neutral scene for their deliberations.

That had been a glorious triumph for the humanitarians of Earth. Man and extra-terrestrial, meeting and talking together as friends, eager to understand one another better and to deliberate on the best and most harmonious methods of opening up their respective cultures. A time of the lion laying down with the lamb—and, without conscious thought, the people of Earth and their small but growing stellar commonwealth quite naturally thought of themselves as the lion.

Captain Jenkins, of the Terran Patrol ship *Castor*, didn't share that opinion in the slightest.

He was standing now just outside the open airlock. From within the orange-lit interior he could hear the scuffle of spaceboots over his pickups and the faint, involuntary sounds of men breathing and swallowing over his suit radio. He stared out into the vast cavern, a space, if he believed what the Starborn had said, that was inside one of their ships. He didn't have time now to be awed by the idea. He breathed in deeply, wondering why he, out of all the men serving in space, should have been selected to handle this crisis.

" Starborn," he said without preamble. " I am prepared to talk with you, as our leaders are preparing to talk, if you show yourself in this place. Otherwise, I shall be forced to regard this capture of a Terran Space Navy Ship as an overt act of war. Do I make myself plain ?"

It had been a clever gambit to mention the talks about to commence between their respective leaders. It might cause this Kal-hajlan to reconsider. At the very least it told the Starborn that he wasn't to be trifled with. Although they had trifled, and very successfully.

The answer he received was not the one he might have expected had he bothered to have any preconceived notions of the way events would turn out.

" Earthmen ! As you refuse to co-operate with us in our orders, we must take other steps. Robots are on their way to arrest you for mutiny against the commands of this ship. Your intership radio will also be put out of action."

Hard on the heels of that statement Jenkins felt his suit radio go dead. All sound was cut off. He waved an arm and hustled into the lock. The valve swung shut and the red cycling lamp went on. He was breathing heavily and a dark flush mantled his skin. He didn't like being pushed around. And this talk of mutiny was so absurd he felt like bursting out and slugging the first Starborn he ran across. Not that he knew what they looked like at close quarters. Humanoid, at least, he knew from photos, but with modifications stemming from their slightly different home environment.

He brushed impatiently through the other men and went straight to the control room up in the needle nose. He left pieces of his space suit strewn along the corridor in his wake. As soon as he was inside he was shouting for Rawson.

" Guns ! Get ready for action. You'll have to institute a runner system, they've fouled up our ship communications. And move !"

" Aye, aye, sir !" Rawson jumped to it. Jenkins shoved his furious face against the glassite port, straining to see away past the needle nose of *Castor*. If this was some super-large stomach to some super-large Starborn ship, there ought to be an airlock up there somewhere. He thought he could make out a vast circle in the metal which might be a valve.

There was also the interesting possibility that if that circle was an airlock door, it might not be the outlet onto space. It might be the inner lock. He hadn't the faintest notion which way the Starborn had pulled his ship into theirs. As to the *How*, that led straight to the psycho wards.

" Guns ready, sir."

" Right you are, Guns." He paused, weighing various unpalateable facts in his mind. Ostensibly The Solar Commonwealth and the Starborn were at peace, ambassadors of goodwill. If he opened up his weapons now, blasted his way out of this crate, he might rupture all that goodwill, start an interstellar war that could rage for centuries.

He felt like a pilot balancing his jets around the Jovian system—one misstep and he would tumble to destruction.

Purkinje looked across, the smile on his dark face too forced and too strained around the heavy lipped mouth.

" If we start something," the Exec said slowly, " I doubt if even a cyb could follow the consequences."

" I know, Purky. But if we stay here we're likely to rot. The Starborn want something, all right. What it is I don't know yet. The chances are that once they've found their data they'll dispose of us." He paused and wiggled his left foot absentmindedly. " I've two hundred and sixty-three people to consider, besides the ship. I often wondered if *Pollux* would have been the better command," he finished inconsequentially.

" Wonder what these robots that are coming for us will be like."

" God knows. If this cave is inside a ship, and not some natural hole in an asteroid that the Starborn have prettied up, then it must be some ship. Probably be some robots, too."

Purkinje drew a breath and the strain lines around his mouth washed out. He chuckled. Captain Jenkins could do that to you; bring a sort of strength that you didn't know you had and show it to you with the conviction that it wouldn't break. He looked back out the port on his control position and said: " *Castor* would have been damned unlucky."

" Would have ?" Jenkins brushed that away, having forgotten his remark about *Pollux*, and went on: " Is that runner chain set-up yet?"

" All correct and ready, sir." Rawson spoke eagerly.

"Thank you, Guns."

MacPherson the biologist came in. At least, that was her title, although aboard the patrol ship she handled the jobs of biochemist, microbiologist, biophysicist and general help around the air plant. Her voice was crisp and controlled, like her figure, and totally unlike her blue-black hair which she habitually wore cut short. Even Captain Jenkins realised the monstrosity of the crime that was perpetrated every time a pair of scissors was used on that lustrous hair. She wore no make-up; but then, she didn't need any.

"I've got those figures on the air outside, sir," she said. Her voice did things to most of the men in the control room. At this time, however, Jenkins was too pre-occupied to notice.

"Yes?"

"Pressure is gradually rising. First check showed 300 millimetres of mercury. Last—just before I reported here—620 millimetres. Nitrogen content 86.4, Oxygen 13.3, Carbon-dioxide .2. Trace below a hundred thousandth percent of the usual rare gases—neon, helium, krypton and xenon. There is water vapour, but the atmosphere is free of impurities. It is definitely purified and regenerated in an oxygen carbon dioxide cycle, probably an algae bacteria culture similar to ours."

"Thank you, lieutenant." Jenkins did not turn to face her, kept his eyes searching the empty space beyond the hull. "Rather low on oxygen. And isn't that a trifle high on carbon dioxide?"

"Very decidedly yes. CO_2 on Earth fluctuates around .03%. .5% is fatal. With the low oxygen count and the high CO_2 we can live out there; but we'll be gasping like landed fish."

Purkinje said: "They told us we could live outside. They said no harm would come to us."

Captain Jenkins cut across the words. Over his shoulder he said: "I believe none of us have had the pleasure of meeting one of the Starborn. That glaring fault in our social education is about to be remedied."

There was no formality about the way Juanita MacPherson pushed her slim figure alongside Captain Jenkins and strained to see into the giant cavern about them. At first she could make out only the maze of girders, angled differently from the view from her laboratory port down in the belly of the ship. Then her breath caught in her throat.

A round ball rolled stolidly from the mouth of a tunnel, a tunnel which she would have sworn was not there a moment before. The ball was about waist high, running, she could see now, on a wide track around its middle. From the top hemisphere branched a number of antennae and radio pickups. From the bottom, one on either side of the propulsion band, snouted two muzzles. They might be ray guns, machine guns, or one might be coffee and the other milk; her mind giggled a little at the thought.

Following the first robot came others, larger, more complex, with many more tentacles and clutching hands. They all had the single central band giving them traction. They appeared to Juanita, holding herself still and taut with unvarnished finger nails digging into her palms, as though they were the outriders of some circus procession. Following them would come the elephants, the white horses, the . . .

A single man stepped out. He stopped, his feet planted wide in strange parody of Captain Jenkins' pose out there, and raised a hand.

His clothes were all scarlet, cut on lavish lines, with much gold braid and ornamentation. Jewels winked at them from his fingers, clearly visible at this distance. He looked like a man—an ordinary, down to Earth Terran—and Juanita had to remind herself that he was an alien, and an alien into the bargain who had forcibly brought their ship here against their will and had promised them that they would come to no harm. Thinking of that heavy CO_2 concentration, Juanita wondered

Captain Jenkins raised a pair of glasses. Juanita itched to snatch them and see the Starborn at closer range; but discipline had not gone to pot when she shoved up against the Captain. His nearness was reassuring. Suddenly, Juanita realised that she needed reassurance, needed desperately to be told that everything would be all right.

To Captain Jenkins the soft breathing nearness of the girl was a conscious thing; perhaps he, too, drew some subconscious measure of strength and reassurance from their contact. He raised the glasses, adjusted the focus, and the face of the Starborn leaped at him.

Just a face. Like any Earthman's. And yet, there was an indefinable something, a fugitive memory, elusive, a certain characteristic of that face that he should recognise.

The Starborn began speaking, and the ship's outside pickups brought the sound in strongly, evidence that air pressure was building up out there.

"Earthmen. As you requested I have shown myself. The robots are ready to take the other steps I spoke of. Please come outside where I can, in turn, see you to talk."

The guy had guts, at that. Jenkins felt a sourness in his mouth. The Starborn could have been shot down where he stood, and he must have known that when he stepped out. Jenkins moistened his lips. Hell! He couldn't cower in here like a frightened psycho when an alien outfaced him on his own terms.

"Hold everything," he grunted. "Exec, take over. And for Pete's sake don't start shooting unless there's nothing else left to do. I'm going outside."

"Aye, aye, sir." What else could he say? Purkinje rubbed his dark cheek. What could he do, if the skipper wanted to go outside? If these filthy aliens did anything to the Old Man . . . Purkinje crossed to the control chair and growled a ready order at Rawson.

It did not take long for the Captain to climb into his neatly recovered spacesuit. He waddled to the airlock and waited for the outer valve to open. Purkinje wished that the intercomm was working. He felt cut off, isolated without the constant knowledge that the skipper was

at hand. As soon as the captain was outside he could be heard over the ship pickups. Until then there was a stomach-upsetting void.

Through the angle port there was a good view of the skipper standing on the airlock rim, preparing to walk down the ramp. It had been wise to wear a suit, that oxygen level was low and the CO_2 that MacPherson had warned about might be a little too much for Earthly lungs. Purkinje kept the skipper well in his line of vision and so Juanita's gasp was his first awareness that something was wrong.

He swung to stare across at the alien. The Starborn had vanished. A shout, rising almost to a shriek, came piercingly over the pickups. Purkinje, horrified, glanced back at the skipper. His head stayed rigid, as though clamped in a vice. Captain Jenkins was sailing through the air, arms and legs thrashing, hurtling over the rolling robots, yelling his head off. The spacesuit caught a blue gleam from some hidden light, and then it had vanished up the tunnel mouth.

Purkinje leaned against the port, feeling weak and sick. " Skipper !" he yelled. Then he forced his lips together, held his body whilst the shakes ironed themselves out and then, in a concrete steady voice, said: " Mister Rawson. Fire when ready, please."

Rawson's high pitched voice echoed: " *Fire, fire, fire.*"

The Starborn had phenomenal powers, that was obvious from the first. Once your ship was dragged, unknown to you, into an airlock of another, vast ship, you came to accept later demonstrations of that power with a phlegmatic calm. Like the intercom and radio being put on the blink. Like the astounding spectacle of the skipper being dragged through the air by some force beam or other. After all that, what else was there left to do but to try to blast your way out leaving the Old Man—leaving the skipper, lame foot and all—to the mercy of the aliens ? Purkinje, if he had been in the habit, would have been sobbing. As it was the icy rage that seethed inside him, so coldly ferocious that it seemed to be burning his guts, left him deadly calm and controlled, hating the Starborn, hating space, hating himself.

There were electronics men, engine room artificers, deck men, everyone who was not needed up in the control section or at the guns —even old Tcharandsky the psychologist—forming a human chain of command from Rawson's control panel through the corridors, branching like nerve fibres from the main stem sideways to gun turrets along the length of the ship. And along that human chain ran the words.

Fire, fire, fire.

The turrets nearest the nose opened up first, but the others of the twenty-five were not long in joining in. In each turret the drill was the same. Four men—the guns were full of automation and needed the minimum of attention—concentrated on juggling their spitballs of

energy, keeping the input clean and level, and throwing each charge after the one preceding as fast as they and their silent machines could operate. Purkinje had started something, all right.

The gigantic puffs of raw energy spewed from the weapons, sizzling bolts of incandescent flame. They crashed outwards with thunderous violence, disturbed air falling back into the vacuum of their passing creating a hellish din. The whole enclosed space lit up. The bolts flew with incredible energy, splashed against some other energy which held them from the alien metal, sprayed back like water hosed at a brick wall.

Visible when the bolts struck, a violet shell surrounded *Castor*, like a cocoon, impervious to the titanic thrusts of power she was spouting forth. Rawson's face was streaming sweat. The air conditioners were working perfectly, but the gunnery officer was with his guns crews in spirit, suffering with them the ordeal of heat that backlashed from the guns. Purkinje knew about Rawson's utter dedication to his guns. He always sweated when his weapons were fired. Then Purkinje realised that he, too, was sweating; that the heat in the control room was soaring and that fresh waves of scorching air were billowing into the control room.

Rawson raised a streaming face. " Can't keep up much longer, sir ! Heat—and we'll cripple the weapons if they aren't cooled !"

Purkinje knew what he meant. In space radiation took care of that problem. Here, in atmosphere, and surrounded by this force field—for that was what the violet shell could only be—heat would mount up, crisping the crews and wrecking the guns. And—they just weren't *doing* anything. The violet shield held firm. They might as well throw javelins at it.

" Cease fire !" Purkinje said—and could have wept.

Rawson's voice said: " Stop, stop, stop," and the cry went billowing down the ship. " *Stop, stop, stop*," a blank admission of failure.

Most of the fire had been directed outwards, but some had dropped towards the floor. There was no sign of the alien robots. Purkinje drew what comfort he could from that. The Starborn had some mechanisms that could be touched, it appeared. Hard on that a fresh wave of robots rolled from the sides. This time they moved with precision, as though executing a drill movement, trundled to rest in an extended line facing *Castor*. Purkinje just stared at them. He was wondering what had happened to the skipper. He remembered Daniel Jukes, and shuddered a little. He didn't want to go like that; even the temporary dissolution by fear of a mind posed frightening concepts that were best not meddled with.

" Shall I blast them, sir ?"

" I don't think so, Guns. Do us no good. Next move is up to the Starborns."

Hard on the tail of that sentence a magnified voice boomed at them across the cooling space, bounced from metal walls and hull.

" Purky ! This is the skipper. I'm afraid you'll have to come out, there's nothing else to do." There was a touch of infinite sadness in the artificially reproduced voice of the captain. " We may be able to make a deal with the Starborn. That is all."

Purkinje shut his mind to the thoughts clamouring for entrance. His heavy lips moved spasmodically.

" All right," he said harshly. " You all heard. Outside. Move !"

Round one of this battle of wits had gone to the aliens. No-one aboard *Castor* had any hopes that the rest wouldn't go the same way.

" Five miles. Period."

" *Five miles* !"

Captain Jenkins sighed and leaned back against the alien metal of their prison. " It's not so big, when you say it fast. And it's perfectly logical, Purky. We've built space stations a mile across—"

" But not a ship five miles long, five miles of metal chasing about in hyperspace, with all the problems . . ." Purkinje broke off, his eyes staring.

" She'll carry something pretty heavy in the way of armament," Rawson said reflectively.

They were sitting and lying around the walls of a steel cargo space, converted into a prison for their convenience. The crew of *Castor* were conversing in groups, their low tones adding a background rumble to the officer's conference. Jenkins had met them there, was telling them the score.

" The Starborn are on their way to the artificial world off Sirius," he went on, his voice a level monotone. " From any point of view it's a clever move to find out what you can about your adversary, even when you're facing him over a conference table. The Starborn have a knowledge of us, scant, but enough to know the language, enough to want to know more of what makes us tick. So—they sneak into the system and swipe a ship. They intend to study her crew." He smiled wearily and massaged his left ankle. " That ship happened to be *Castor*."

" Cunning devils," Timmins said hotly.

" What—happens—to us, afterwards ?" Purkinje asked slowly.

Captain Jenkins shrugged. " They promised me that no harm would come to us. Something about inspecting our minds, our personality patterns, building up a composite picture of an Earthman,

and then letting us go with all memory of this incident blocked off by post-hypnotic suggestion."

"They could, too," Rawson said. Purkinje nodded.

"They've already stored up a lot of data about the way Jukes went, and the way we reacted. Where is he, by the way? I don't see him around—"

Jenkins broke off. He stared at the circle of officers. His brows crinkled. "Well? What is it?"

"My God!" Purkinje said softly. He swallowed. "We left him aboard, sir," he said weakly.

"You what!" Jenkins looked incredulously at his officers. Purkinje was biting his lips. The others avoided his eyes.

"We were rushed, sir," Purkinje went on, not offering excuses, but making a report. "He was taken down to the sick bay, which happened to be empty, and in the evacuation must have been overlooked. Because we have no ship's doctor; but I take all responsibility, sir. Shall I arrange to have him brought here?"

Castor's doctor had fallen sick under one of the diseases against which he fought, and there had been no replacement at advanced base. Tcharandsky had coped so far.

"Yes, please, Commander." Jenkins could not allow too much importance to be attached to this detail. Then, abruptly, as Purkinje was rising: "No! Wait! Hold it, there may be something in this we can turn to our advantage."

The Exec sank back, looking at his skipper. The others crowded closer, as though eager for scheming, ready to plan all kinds of cloak and dagger adventures. Jenkins beat one balled fist into the palm of his other hand.

"This ship is five miles long. Broad in proportion, too. That means a great deal of room aboard, so much that I doubt if the aliens can ever know just what is going on at every place at once. There are a lot of them aboard, delegates to the truce talks, and I'll bet a busted transistor against the fleet flagship that nobody knows just who is walking around in here."

"You mean," Purkinje said softly, "one of us could move around without their knowing."

"Yes."

"But, Jukes—" expostulated Rawson.

"I know." Jenkins' words were cold. "Maybe someone else will have to change places. The Starborn counted us mighty carefully as we came in, I expect you noticed. They may have some idea along similar lines. Just remember, there are two hundred and sixty *two* of us, if anyone asks."

" Aye, aye, sir." The rumble came from them all.

" Now," went on Jenkins briskly. " We have to think up a way of throwing the spanner in the works. Any suggestions ?"

A number of ideas were proffered, revolving around the basic of " busting out and carving them up." The thought of Jukes lying in the sick bay fretted at their minds. But no-one could suggest a way of getting one of themselves back there to change places. Or of doing anything when he was back.

Lieutenant Juanita MacPherson had been silent so far in the discussion between her superiors. That sick feeling of despair, of the crying need for protection, was still with her. She felt bitter at the way the skipper looked crumpled up inside; she could understand from a different viewpoint from the professional angle of the other officers, just what all this was doing to the skipper. It was the feeling of impotence, mainly, that was driving needles of frustration into their brains. Tcharandsky might have more work, yet.

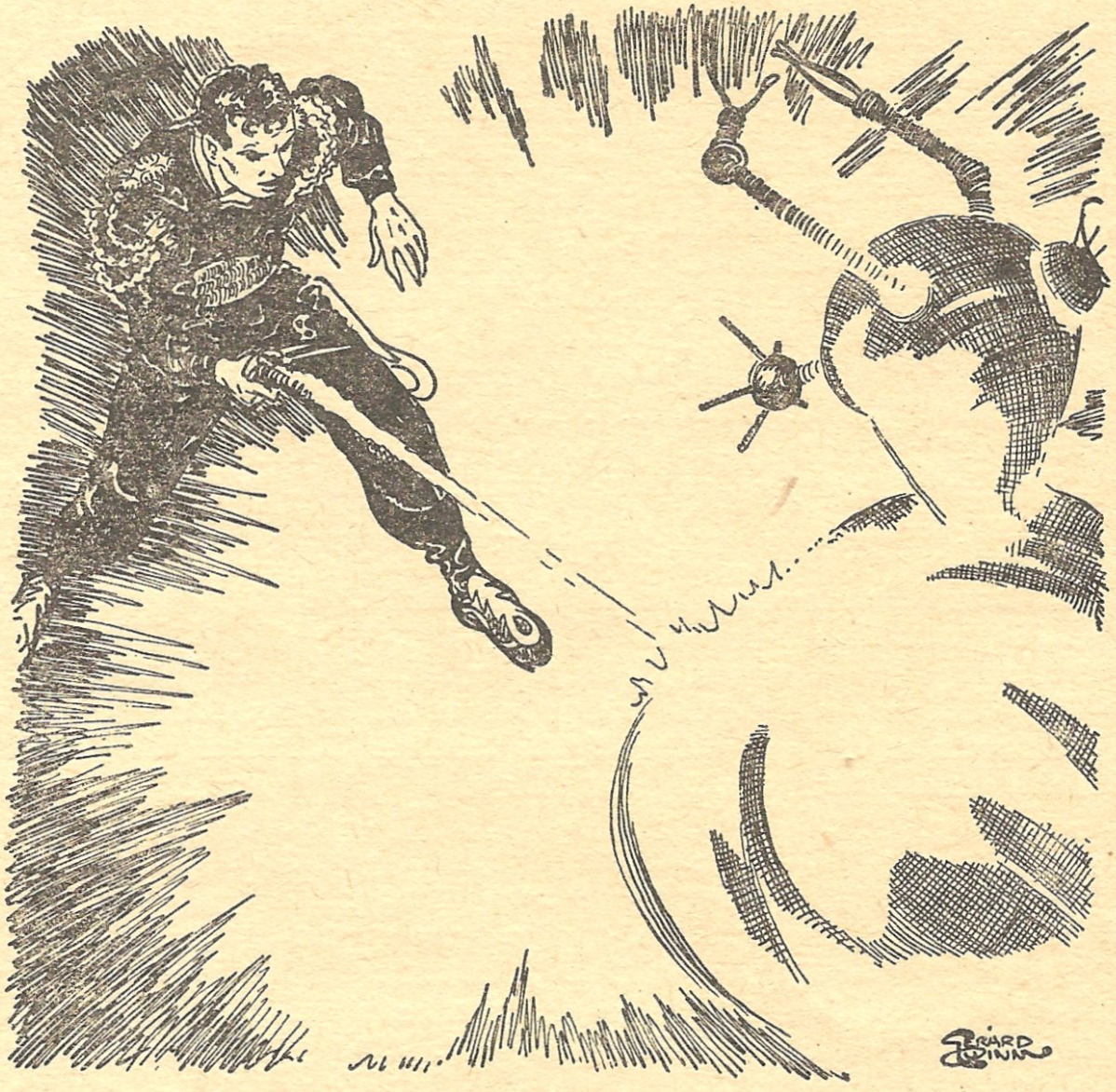
Everybody was breathing in coughing, gasping attempts to cram as much oxygen into their lungs as possible. Juanita felt dizzy continuously, and yet she suspected that there was a slight concentration above average, here in the prison, of CO_2 and that outside in the corridors of the ship a Terran might be able to walk along without arousing attention.

And then, of course, she saw the obvious method.

" Check me," she said, suddenly, bringing the others' heads round in surprise. She began counting off on her fingers. " One—the Starborn don't need as much oxygen as we do. Two—the CO_2 concentration aboard is abnormally high for Earthly standards. Three —they must recycle their air in much the way we do. That means they must have an algae bacteria plant set-up. Four—we need to put them out of combat for long enough for us to get back to *Castor* and blast off before they can blow us out of space. Five—we have a man free they don't know exists." She clasped her fingers together on the final point, and smiled.

" Six—smuggle me aboard *Castor*, give me five minutes, and then find the Starborn air plant."

They didn't need to be told what she was driving at. It was obvious, and, to Jenkins especially, irritating that he hadn't personally seen it. But Lieutenant MacPherson practically lived down with her algae and bacteria and fluorescent lights, and it so happened that the answer to their problems lay in the field of her speciality. Often in the past non-technical laymen had asked him why it was necessary to carry supplies of CO_2 aboard. He chuckled.



" Lieutenant, you deserve a medal for this. All you'll get, of course, is—"

" I just want to get out of here," Juanita said gravely.

That sobered them up. Their heads came together again. Eventually, the answer was simple. Tcharandsky, his rubicund face aglow, supplied it, and received appreciative nods from the command group.

" Right." Jenkins was crisp and invigorated again now that action was imminent. " We don't want to hurt the Starborn too much—after all their intentions were not to damage us. But, if they get in the way, have no hesitation in using whatever force may be necessary. However, I think Lieutenant Tcharandsky's idea sound. You shouldn't have any trouble. Now, who's going ?"

" Me, for one," Juanita said promptly.

"Of course. You know all about your green plants. Who else?" Jenkins was not in the habit of allowing conferences aboard when jobs were being detailed. Here, the conditions were slightly different. And—although he wanted to, he knew he couldn't go himself.

"Me," said half a dozen voices simultaneously.

"All right. Tcharandsky, for two." Jenkins lifted his leg and rubbed his ankle reflectively. "It's highly probable that the Starborn will allow two of us. More, and they may smell a rat. But we must have the man who is going to do the dirty deed." He held up a hand, chuckling sympathetically as both Juanita and Tcharandsky began to protest vehemently. "No, no. Neither of you two will do, for obvious reasons."

"It looks to me, sir, as though I am the logical choice." Purkinje was trembling with eagerness, yet he still had that concrete-steady control over his voice.

"I hesitate to contradict you, sir," Rawson said apologetically. "But, well, I think I should go."

Purkinje glared at him. Jenkins laughed. Only a little, faint and soon-dead laugh; but Juanita experienced a flare of pleasure, almost of passion at the sign of the skipper's aroused interest in life. This thing would work. It *had* to.

Lieutenant-Commander Rawson sat back against the wall, his face held into a tight mask over the inner conflagration churning under those chiselled features. He'd often been ragged about the classic lines of his face—just as had poor Jukes about his batwing ears—and he very often deliberately allowed emotions he felt to ride his face with far more force than he actually felt. Now, he kept his mouth shut and that Grecian profile stony. He'd come into the Navy deliberately, and stubbornly refused to talk about his previous life. Now, right this minute, might be the time to open up.

Captain Jenkins was speaking. "I hesitate to mention this subject at a time like this; but Lieutenant MacPherson is a girl, which automatically cuts her out. As for the claims to go of Tcharandsky, and you, Purky, well take a look in the mirror. So, logically, that leaves . . ."

Rawson stood up. "Me," he said succintly. He spared a grin of triumph for Purkinje; but he was thankfully conscious of a tremendous relief at not having to tell the skipper what he had done for a living pre-Navy.

"That's right, Guns," Jenkins said. "You. Now, you understand what's to be done? No problems? Questions? All right, then. Tcharandsky, shove over to the door and start hammering. Macpherson stand by Commander Rawson. All set? Good luck—and go!"

Rawson burst into a hideous yell, started ripping his clothes, capered around, flinging his arms wide like a drunken prophet. Tcharandsky was hammering on the door with his spaceboots, yelling at the top of his voice. Crewmen scrambled back, white faced. Captain Jenkins swung a quick thumbs-up signal to them and began to yell in unison with the psychologist.

The crew took it up. In no time at all a perfectly hellish racket was bellowing through the corridors of the Starborn's five mile long ship. A vagrant thought crossed Jenkins' mind that five miles was a long, long way. Maybe no-one was within hearing distance.

He needn't have worried. The door slid aside and two robots rolled in like horizontal yo-yo's, flat trays covered with what was probably food stacked neatly in layers on extended racks. Tcharandsky darted into the corridor, eluding a robot's swiftly extended tentacle, and Jenkins heard, even above the uproar the others were creating, the psychologist's ear-splitting screeches. Inevitably, a Starborn came loftily to find out the cause of the disturbance.

Tcharandsky, miming and vociferating, explained.

"Our crewmate!" He declaimed. "Our comrade! He is sick, dying—we must have medical attention and drugs aboard our ship. Hurry! We must take him there at once."

Jenkins stopped shouting. The crew fell silent sensing with their captain that something more than what appeared on the surface was taking place. Then a sigh of relief came from all the officers, staring tensely at the tableau at the door.

The Starborn made a contemptuous gesture and said: "Very well, Terran. You will be escorted to the ship and back. I do not have to warn you what will happen should you try to escape."

They speak good English, was Rawson's immediate thought. He wouldn't have to worry about that too much, then. Assuming, that is, that he even got out of *Castor* alive.

Almost at once he was being hustled along by Macpherson, who had thrown a scarf around his head as though to control his thrashing. Tcharandsky took his other arm and they plunged after the Starborn, three further robots rolling silently from the shadows and falling in as rearguard.

"Well, that's that," said Jenkins. "Now we sit and twiddle our thumbs. Mr. Timmins, you might carry out a casual check of the crew, just tell them to be ready for any break that might occur. And keep them looking for spy-eyes and mikes. We haven't found any yet . . ." He didn't finish the thought; but the content was obvious. If the Starborn knew their plans, then what might happen to Macpherson, Tcharandsky and Rawson? Not to mention Daniel Jukes.

" Now, Purky," Jenkins continued, dragging his thoughts back to the task at hand. " We'll have to organise the dash to the ship and try to think of every eventuality." The steel room that was their prison looked to the casual eye as though it contained a bunch of morons or dead-beats. In fact, the walls were humming with the hidden activity that pulsed between the Terrans. They might be specimens: but they didn't intend to be co-operative.

To Rawson, stumbling along between his two comrades, the cloth over his head making breathing even more difficult, some of that feeling of purpose he had received from the skipper remained. This was a hare-brained scheme at best. As they went up the ramp to *Castor* he hoped that Tcharandsky was getting a good picture of the guard layout. Inside they went straight to the sick bay. The Starborn went with them, leaving the robots at the airlock.

Lieutenant-Commander Daniel Jukes was asleep.

As they went in through the door, Rawson whipped the cloth off his head. The Starborn backed up, his eyes going wide and his hand streaking for the weapon hanging on his belt. Rawson flung the cloth over the alien's head and in the same instant Tcharandsky cut down scientifically with the edge of his hand against the alien's neck. The Starborn said: " *Glunk* !" He pitched to the deck, rolled over, and lay with his face half covered by the entangling cloth. Tcharandsky bent over him, his face suddenly sombre. Then he straightened up.

" Their organs must be disposed slightly differently from ours. I thought I'd killed the poor goof."

" Quickly," snapped Rawson. " MacPherson—airplant !"

" Aye, aye, sir," she snapped and went off at the double, her long legs straining against her coverall trousers.

" Dress Jukes—if he wakes up slug him." Rawson was stripping the brilliant carmine uniform from the alien, then stepping out of his own coveralls with the two and a half stripes on the shoulders. The transfer of clothes took not much longer than three minutes. Jukes was saying: " Wha—What's all this ?" Tcharandsky glanced across at Rawson. He nodded grimly. Jukes went limp. Tcharandsky rubbed the edge of his hand. Then MacPherson was back, her face flushed, hair awry, carrying a bottle with green liquid swirling darkly inside.

" Come on. If the robots seem suspicious, cut down on them." The other two nodded, concealing weapons from the racks. Tcharandsky had found a plastic box of sticky bombs. Rawson finished gagging and binding the alien with insulating tape, and raced after the others. They came up to the airlock in a bunch, Juke's heels dragging over the metal excruciatingly loudly.

Rawson stepped out, hand near his belt. The robots purred softly, then wheeled away, ready to fall in on the rear. So they accepted him as a Starborn ! Rawson didn't know if he should feel insulted about that; but the elation bubbling in him warned him that he must take things easy. He always did have this tendency to consider a case finished as soon as the first clues fell into place. He jerked an arm impatiently.

The trio, Jukes hanging in the middle, walked down the ramp. Rawson stood below, trying to look dignified, proud and angry. He didn't even try to look alien—that was something you had to be born into. He didn't smile. He allowed them to precede him—he hadn't the faintest notion of the way back to the prison. That journey seemed to last a couple of lifetimes and then they were wheeling up to the locked door. The robots sprang forward, opened the door, and Rawson stood aside and waved the Terrans in. He didn't even allow himself a whisper of good luck to them. The door shut with a final clang.

Now what did he do to get rid of the robots ? He couldn't talk to them, that was for sure. His hand touched the weapon, metal cool under his fingers. He might have to blast them. He waved an arm peremptorily, and strode off in the direction he had come. By straining his ears he thought he could detect their soft whirring noise; but he couldn't be sure.

After a dozen steps he chanced a look over his shoulder. The robots were rolling away from him, like a trio of boys fresh out of school. He let out a sigh of relief and wiped his forehead. Now for the alien.

The Starborn was conscious when Rawson re-entered the sickbay.

" You'll tell me what I want to know," Rawson said conversationally. " Or I'll cut off your ears, then your nose, then your eyes—I think you'd better talk." The way the words came out, cold, flat, completely without mercy, frightened Rawson himself. The alien talked.

Which was, of course, another clue to the Starborn. Their classic features reminded Rawson of something. Oh, sure, he had a face out of a similar mould, that was why he had been chosen for this job; but there was something else. He left the Starborn where he was, he was tied securely enough, and went back into the five mile length of ship.

Captain Jenkins' diagnosis had been correct. With the bottle of green algae under his coat, Rawson was still able to walk arrogantly along the ship passages, free and unmolested. It reminded him of the way criminals could remain at large in a big city, the very size of the

place defeating the limited attempts of the law to find and capture them. His confidence grew. He met few aliens, at that. There were many and varied robots scuttling about; but the aliens evidently did not come often to the working levels of their ship. The Starborn's directions were simple to follow. Rawson came into the vaulted space of the airplant before he realised that he had reached his goal. He stared around, awed by the immensity of the place.

Yet, when he compared details, this was almost precisely similar to the airplant aboard *Castor*. Just the scale that was different. Through broad tubes of transparent plastic the green algae was pumped in suspension. Over there was where the trace elements were fed in, iron, phosphorus, potassium and magnesium. The Nitrogen they took from the air, along with the CO_2. Water was fed in through a series of shining tubes, and the first thing Rawson did was to set the master cock to full and then jimmy the valve so that it could not be shut.

He dumped the bottle of Terran algae into the mess of alien stuff bubbling through the tubes and, completely without any self-consciousness, said: " Good luck, little 'uns !"

He thought he ought to try to increase the illumination; he saw that the aliens used the same system as Terrans, a period of illumination followed by a time of darkness ten times as long when photosynthesis did its bio-chemical wizardry. Finding the row of master switches was easy, puzzling out how they worked was a different orbit altogether. Eventually he pulled a lever that looked as though it might be a rheostat and was pleased when the fluorescents visibly brightened. He'd done all he could to ensure for the earthly micro-organisms optimum operating conditions. Now it was up to them, and their friendly bacteria swimming in suspension with them. He could feel a warm, strange sympathy for the minute single cells of algae—and the feeling was not so strange, when you came to think about it. Both they and he were of Earth, surrounded by mysterious and deadly artifacts and organisms that had never known Earth.

He was roused from that daydream with a jolt. A Starborn, all blue and silver, had stalked into the room. The Starborn's eyebrows went up. He walked over to Rawson and said something that was all gutturals. Rawson drew himself up, motioned with a gradiloquent gesture. The alien turned his head to follow the direction of Rawson's pointing left hand. Rawson hit him directly on the chin with his right, followed up with a knee in the groin. Then he tromped all over the alien as he squirmed on the floor. Now what was he to do with the goof ?

He could feed him into the vats. He rejected that idea at once. So far, no-one on either side had been killed. Rawson had no desire to set a precedent. Eventually he trussed the goof up with his own foppery and stuffed him away in a locker along with glass testing instruments. He stood back, panting slightly, more from excitement than exertion.

MacPherson had said twenty-four hours might be enough. That meant he had to keep out of sight for that amount of time and also have his end of the breakout organised. If he could make it safely back to *Castor* it would be all right. He took one glance round the massive airplant, and then went straight out and along the brilliant passages as though he owned them.

Down at the first intersection a group of robots wheeled, swung their antennae at him, then charged in a fashion unmistakably hostile.

" Stop sniffing, Mr. Timmins ! We won't detect any change at all until after twenty-four hours." Jenkins turned away from the Astrogator and bent over Jukes. " How is he ?" he asked Tcharandsky in a low voice.

" Coming round all the time, sir. I've given him some dope to quieten him. When he recovers he should be in command of himself again."

" We'll need him. We'll have to get a message off as soon as we hit space." Funny, Jenkins realised, how calmly they were all taking it for granted that the scheme would work. " MacPherson," he went on, " run over those figures—I want to check the soonest we can expect any change."

Juanita ran a hand through her cropped hair and said tiredly: " I picked the new strain *Chlabaena*; it's a rapid growth, maximum oxygen cell. Really a killer, with associated bacteria as well. The bacteria will devour dead cells and release oxygen in their own right too. Between them they should make a wreck out of the Starborns' plant. The cells divide about every four hours, you remember we had trouble with lack of CO_2 supplies that time off Pluto, and had—"

" I remember, Lieutenant," Jenkins said. " Twenty four hours for first reactions. After that we must be ready for any eventuality. Oxygen incidence will increase very rapidly after that. Yes, thank you, MacPherson."

They had eaten the alien food—it was palateable and obviously a protein and carbohydrate product of the algae plants—and now they were trying to contain their excitement until the time came for action. He wished he knew how Rawson was getting on; he didn't even know

whether Guns had reached the alien airplant. They might be all sitting waiting for something that wasn't going to happen.

Time passed slowly—so slowly that it was with a distinct sense of surprise that he realised that he, and the men and women around him, were breathing easily, without the gasping they had grown accustomed to. He looked up, hope flaming in his eyes. Lieutenant MacPherson was staring at him, the same hope shining from her face.

" Give it another cell division," she said tightly, " and we can think about breaking out."

Guns walked forward slowly. The robots swung past him, careered on towards the airplant. Hell ! That meant that some alarm had been tripped. The robots would try to rectify matters, might very well upset all MacPherson's calculations.

Going back to the airplant took him fifteen seconds. He must see that this end was okay before going on to *Castor*. He was undecided as to whether he should blast the robots or allow them to carry on. Either way presented problems. They rolled swiftly across the smooth floor, where not a minute ago he had been binding an unconscious Starborn, and clustered around the water intake.

One robot began to wrestle with the jammed valves. Presently another ball detached itself from the group and rolled swiftly towards the exit, where Rawson crouched in the meagre shadows. Going to report ? Unlikely, with sub-radio communication throughout the alien ship. The robot rolled past Rawson into the corridor, and he made up his mind.

The silvery discharge from his pistol winked and vanished, and the robot's body vanished with it. There was a slight brown burn on the far wall; a little too much aperture, but that couldn't be helped. It was entirely possible that there was an alarm circuit in the robots, or that the aliens had instruments which recorded any weapon discharge in their ship; but that couldn't be helped, either.

The alien weapon was effective, too. Earth would give a lot just to examine this one he held in his hand. Inside the airplant room the robots were still conferring around the jammed valves. Rawson began to wonder if he was doomed to hanging around the door picking off robots as they came and went. He could do that for a period, then he would have to get back to *Castor* to ready the ship. As it turned out he needn't have worried.

MacPherson had warned him that extra water, vitally necessary if extra oxygen was to be produced in any quantity, would have to be provided for at least two hours, working on the supply ratio aboard

Castor. Here, aboard the alien vessel, even allowing for the immense discrepancy in size, the water intake would in all probability be on the same ratio. When two hours had passed the robots—who would have been sweating if they could, Rawson guessed wryly—had unshipped and replaced the damaged valves. The water supply went back to its normal input level. "So what?" Rawson chuckled to himself. "The damage is already done."

He slipped away down the corridor, heading back to *Castor*. There were robots and aliens aplenty, moving about, passing in both directions. Rawson marched arrogantly through them all, not deigning to notice the robots, hoping that the Starborn would not notice him. Jenkins' hypothesis had proved itself again—five miles of ship was just too much to keep an all-knowing eye upon, even for aliens as scientifically brilliant as the Starborn. And yet, to Rawson there was a strange and chilly feeling of *déja vu* ; this subterfuge reminded him strongly of other times, other days before he had joined the Navy and had the benefit of their hypno-tape indoctrination.

Inside *Castor*, having passed various robots who might have been on guard, he found his legs were weak and his stomach fluttering. He took a couple of pep-pills and felt better almost immediately. He hoped the crew were going to stand up to the strain without the help of pep-pills.

Time passed.

Checking with the ship's chronometer, Rawson went down to the sick bay and roused out the Starborn they had left trussed there. The alien was blue in the face, his eyes glaring over the black insulating tape swathed across his jaws. Rawson cut him loose and stood back, watching him.

The Starborn was in trouble. Rawson had noticed how much easier breathing had become; but for the alien quite the reverse was happening. His breathing was slow and shallow, probably controlled, quite definitely an attempt to limit the oxygen taken into his lungs. Rawson felt sorry for him: it wouldn't work, he was sure.

"Will you kindly adjust your atmosphere here?" the alien gasped. Rawson started, then relaxed. Of course. The goof thought that this higher oxygen content was confined to *Castor*. He was in for a shock.

The alien said: "My lungs are on fire, Terran! You can live comfortably at an oxygen count"—cough—"lower than"—two coughs—"this!" He broke down then, coughing, and, to Rawson's horror and dismay, bright red blood flecks appeared on the goof's chin.

" I'm sorry," he stammered. Sure, this was what they had planned, this fiery eating up of the Starborn's lungs, but he had not anticipated such a violent reaction as this. What had MacPherson said she was putting in the airplant—*Chlabaena* ? They were multi-prolific, she had said. Cell division proceeded like a blossoming nuclear reaction if the cells could reach enough nitrogen, water and carbon dioxide. Well, there was plenty of nitrogen and CO_2 in the Starborn's air—and he'd given them a head start with the water. He wondered what was going on in the airplant, and whether the aliens had tried anything yet to dampen down the growth rate. MacPherson had said that a twenty four hour period of slow growth—when the algae change over would not be noticeable—would be followed by a wild and incalculable upswing of cell division and oxygen release.

It was time to begin activating the ship.

In the midst of his first movements, re-activating the piles and checking their output against required consumption up in the control room, Rawson paused, thinking. There was an obvious flaw in the Earth arrangements so far. The Starborn would be very worried indeed about their airplant's haywire performance. They'd rectify that as soon as they began to feel the first effects of the increased oxygen, although MacPherson's figures promised them a heap of trouble. But there was nothing that said they wouldn't don spacesuits.

Rawson went out of the control room fast, collected a disposal bin full of weapons from the racks and raced helter-skelter along towards the prison. The plan called for the Starborn to be so busily occupied with controlling the air in their five mile ship that, taking that very size into consideration, there would be time for the Terrans to blast out—the violet screen dead, they hoped—and be into hyperspace before the Starborn reacted. It was a nice plan. But one alien in a spacesuit might stop it cold.

Rawson passed quite half-a-dozen aliens lying gasping like stranded fish on the smooth metal decks. Robots were running frenziedly about and Rawson's eyes narrowed as he saw what they were up to. They were forcing open long-unused panels and choking off the air-lines webbing the vessel. He must hurry. The Terran officers had agreed, framing the plan with the biologist there in the prison, that the Starborn would not at first connect the atmosphere disturbance with the Terrans. But it would not take them long to reach that conclusion, and, when they did, to react violently. Rawson was panting himself now, flogging his body to cover the distance to the prison at top speed.

One Starborn, in a spacesuit, up there in the unknown lengths of the alien vessel's bow, one alien conscious enough to press a few vital switches over. Rawson skidded into the corridor leading to the prison, seeing robots standing before the door and other robots clustering around the bodies of three Starborn writhing on the deck.

One of the robots, a chubby ball, was trundling up with a spacesuit. Rawson blasted suit and robot. The other automatons whirled, their snouted muzzles rising questingly. Rawson blasted them, too. Then he was hammering on the steel door, shouting.

"Stand clear! I'm blowing the door in!"

On the words he hosed a stream of the lethal alien silvery radiance at the door. The metal melted and ran brown around the gaping hole that appeared. Through the aperture Captain Jenkins stepped, gun in fist, his craggy face alight with eagerness.

"Guns! You made it! Good work." Jenkins waved his left hand. "Come on, to *Castor*. And move!"

In a cheering tide, the men of Earth poured through the shattered door and pounded down alien corridors, their footfalls loud against cold and alien metal. In no time at all they were streaming up the ramp, dispersing throughout their ship to their familiar places. Rawson noticed that even Daniel Jukes was hurrying to his communications panel, face pale and with black smudges under his eyes, but with a fierce determination making his batwing ears suddenly not comical at all.

Reports were tumbling into Jenkins, standing taut before his command post. Piles, Engines. Stardrive. Artgrav. Atmosphere. Communications. Where the hell was Guns!

"Guns ready, sir." Rawson had stripped off his alien carmine clothing, stood in hastily snatched up coveralls.

"Blast those locks, Guns. You know what to do." Jenkins turned away on that order and spoke sharply to Timmins. "I want us in hyperspace just as soon as we pop free, Mr. Timmins. Don't worry about a course. We'll decide that when we're free."

"Aye, aye, sir."

A voice was bellowing in his ear: "Fire, fire, fire."

"*Fire, fire, fire.*" It smashed back at him as the sides of *Castor* erupted their livid spitballs of energy. This time there was no violet shell—Jenkins had heard all about that heart-breaking spisode from Purkinje. The Exec was grinning beside him now, his heavy lips curved in derision at the Starborn. *Castor* shuddered.

Abruptly, the incessant hellish uproar that had been battering at them over the outside pickups faded. Jenkins could see loose metal and wires blowing madly as the air in this giant lock wherein *Castor*

was imprisoned rushed out into space. Everything seemed to be happening at once.

Where in the blazes was the lock? There, as he'd suspected, up front. A tricky problem to get through . . .

"Half forward!" ....

"Half forward, sir."

Castor moved, lurching over the skids supporting her. The nose poked through and there was blessed space, sparkling with stars, opening out before them.

"All forward! Mr. Timmins! Take her!"

"All forward."

"Aye, aye, sir." Timmins' hand punched the red alarm button. The stardrive alarm bonged.

Beep. Beep. Beep.

Jenkins braced himself.

Castor shuddered, a heavy explosion trembled all the length of the ship. More smashings followed and then Timmins had sent her into the strange unworld of hyperspace and they were free. Jenkins shook his head and swallowed.

Purkinje had vanished as soon as the first explosion had given the alarm that they were hit. Now he reported.

"They caught us with a beam weapon, sir," his voice was calm and unruffled over the intercom. "Knocked quite a bit of the stern away. Airtight bulkheads 26 and 27 standing the strain well. Submit damage not dangerous to astrogation."

"Very well." Jenkins made it sharp. He'd want to know about casualties, if any, later. As it was, they were free. The thought was like wine to a parched man. And all because of a girl, Lieutenant MacPherson. Well, not quite all. Guns had done extremely well, he must get the full story as soon as practicable. And, it had been his own idea that a man could stroll around inside any craft as big as a five mile hulk must necessarily be. He smiled and reached down to rub his ankle.

"Guns," he said, his voice sharper than he intended.

"Sir?"

"Pass the word for Lieutenant MacPherson, please. Oh, Guns, I want a word with you and MacPherson as soon as she gets here." Jenkins was very pleased with the world—the world of his ship, that is, and the section of the Galaxy held by men. Naval Headquarters would pounce on the information he was bringing in. And there was the matter of the captured alien aboard, too. Not to mention the silver-beam pistol that Guns had been using. Of course, his ship had been damaged, when strictly speaking Earth was not at war, which

should mean a court-martial—but, somehow, he didn't fear the outcome of that, apart from the normal worry any court-martial brought.

" Sir ?"

" Ah, Lieutenant MacPherson. And you, Commander Rawson." Jenkins beamed on them. " Well, you two have put up a good show. Very commendable."

Juanita said: " Most of the credit, sir, belongs to my little green plants, my *Chlabaena.*" She was overjoyed at the smile on the skipper's face. It made everything worthwhile. " When you think what that bottle, multiple cell division every three or four hours and the well-known doubling theory producing a gigantic growth-rate, has done to the Starborn—well, it makes you realise that power doesn't rest in five mile long ships. Does it, sir ?"

Jenkins kept on smiling. Speeches, it would seem, were in order. " I agree. And that reminds me of what I saw in the Starborns' faces. Well, Guns ?"

" I saw it too, sir. Reminded me of the ancient Romans. Proud. So proud that they couldn't think we'd be able to do anything against them." Rawson hesitated, and then added: " The sort of pride that's meant when it comes before a fall."

" Precisely," said Captain Jenkins. " And now," he said, still smiling. " Tell me, Guns, how was it, keeping clear of the aliens ? Was it as easy as I suspected it might be ?"

Lieutenant Commander Rawson rubbed the back of his neck and smiled wryly. What the Hell ? The Old Man was only seeking some glory, some part of the successful action. And, when you thought about it, if it hadn't been for him and his damned cheerful morale, twisted ankle and all, none of them would have done much. Not even MacPherson and her deadly little green algae. No-one would have even started fighting back with that spirit.

" Well, Guns ?" prodded Captain Jenkins. " I had had the idea that we might send the ship's black sheep. A crook would make a perfect choice for someone who had to keep out of sight like that. He would have had plenty of practice—why, what's the matter man ?" For Rawson was almost laughing aloud, and then, irrepressibly, he was laughing, great guffaws of released pent up strain. Jenkins' thoughts crystallised.

" You've always been cagey about what you did before you got into the Navy, Rawson," he snapped. " Were you a crook ?"

" Good Lord, no, sir !" Rawson stopped laughing. So he'd have to spill the beans, then. " I agree with your analysis of the best man, sir. Except for one thing. A catcher of crooks would be better—he'd see both sides of the problem. And, you see, sir, I was a police-

man, a detective, before I joined up." He sighed. "And you know what everyone in the Service says about policemen. All coppers are bas——"

"Very well, Commander!" Jenkins snapped, snatching a fleeting glance at MacPherson standing cool and straight, her cropped glorious hair shining. "I quite understand. Although, in this case, I cannot fully agree."

He stared into the autoplot, where stars glimmered spread out for the plucking.

"And now for Naval Headquarters," he said softly. "And to find out what we shall have to do about the Starborn."

Kenneth Bulmer.

THE LITERARY LINE-UP

Next month commences the first part of a new serial, "Who Speaks Of Conquest?" Lan Wright's first novel-length story, and one that will please a great number of readers, for it is "space opera" at its very best. It depicts Man making his first interstellar journey to Centaurus only to find that our Galaxy is a well-populated one and he is expected to become a vassel ally of the Galactic Council—or else. Naturally, Man chooses the latter alternative otherwise there would be no story. It is an edge-of-the-chair thriller packed with logical assumptions guaranteed to reduce your fingertips to the bone during the monthly intervals of waiting for the next instalment!

Short stories for the issue have not at this writing been finally decided, but there will be several, plus the usual features.

Story ratings for No. 42 were :

1. Lawyer At Large - - - - - - - E. C. Tubb
2. Puzzle For Spacemen - - - - - John Brunner
3. The Jakandi Moduli - - - - - Francis G. Rayer
4. Panel Game - - - - - - - Brian W. Aldiss
5. Prime Essential - - - - - - Frank Weight
6. Getaway - - - - - - - Michael Harrison

S-F on Television

Since the initial announcement in our last issue of Associated Television's plans for science and science fiction programmes over London and Birmingham there have been considerable changes in schedules and even now, two weeks before Birmingham officially opens, it is not possible to list the actual plays in sequence for four weeks ahead.

SCIENCE FICTION THEATRE—Birmingham, Fridays at 7.05

February 23rd. "**The World Below,**" starring Gene Barry as Captain Forester, master of an experimental submarine that stumbles on a mysterious city beneath the ocean. The submarine smashes on a reef and three of the crew escape in pressure capsules. Fact behind the fiction: pressure beneath the ocean.

March 2nd. "**Barrier of Silence.**" Just as a certain pitch of sound can shatter rigid molecules of matter, so can *silence* break the will of Man. The play takes the form of a mental expert experimenting upon a man suffering from amnesia.

Other plays scheduled but dates not fixed: "**Negative Man**" the story of an electronic brain and a man who receives an electric shock from it ; "**Beyond**" featuring faster-than-sound travel ; "**A Visit From Dr. Pliny.**"; and "**The Strange People At Pecos.**"

MEET THE PROFESSOR—London and Birmingham, Thursdays, 10.00—10.30 p.m.

Maurice Goldsmith's exciting science magazine for the family will answer a wide range of questions by film and interviews with experts. On February 23rd he will deal with "What happens when a cat falls?"; A dramatised film version of the largest recent small-pox epidemic ; The psychology of punch-drunkenness ; "Are red-heade dpeople aggressive ?"

Other subjects to follow in later programmes: "Is genius akin to madness ?"; "Are you a mesamorph ?"; "What is painless childbirth by the Pavlov method ?"; The invasion of noise; Investigation into chewing; "Why are cats left-pawed ?"; Radio-isotopes save a man's life.

And in late March or early April an entire half hour will be devoted to "**Science Fiction—Who and Why ? (A symposium)**" complete details of which will be in our next issue.

This is a somewhat different type of story — the story of a mass escape from Fear — yet so cleverly has Mr. Woodcott interwoven thoughts and actions that it needs reading twice to flavour in full the implications involved.

FAIR

By Keith Woodcott

" *Roll up* ! *Roll up* ! "

The words were English, and therefore human, but the vocal cords behind it were electrons strung out on a wire, the resonating chambers which gave it volume the vacuum in radio tubes, the throat which sent it blasting its message into the night multiple and gigantic.

" *You'll find it here* ! *Whatever it is* ! "

. . . Wrapped in a gaudy package three miles across and tied with a blood-red bow. The package is more important than the merchandise; wrap it right and the one-every-minute men (and women) will buy. And buy. And buy.

" *Do you want romance* ? "

Maybe he was a genius, the man who got that shuddering, suggestive, leering note into that sterile mechanical uncomprehending roar. He was certainly a success.

" *Do you want thrills* ? "

Add sub- and super-sonics to taste; result, a rising of the hair on the back of the neck, a fearful but somehow pleasant tonic dose of adrenalin through the system. Knowing how it's done makes no difference. It reminds the maiden lady of the night she was *sure*

there was a man following her—but she doesn't come here, does she? We can forget about her. It reminded Jevons of the sensation of hanging in space produced by turning over on top of a loop—fifty, a hundred thousand feet above the earth, at a thousand, fifteen hundred miles an hour.

"*Do you want amusement?*"

Some people are amused by odd things, the monstrous tone seemed to imply, faking a conniving, understanding innuendo which it could never have possessed, a tolerance of human foibles which it did not know except as figures in an accounting bank. There was a hint of a belly-laugh; Jevons thought wildly of Moloch, and his brazen stomach filled with fire.

"*Well? Come and GET it!*"

But there was one thing they didn't offer, something you weren't supposed to want because there wasn't any of it to speak of. Peace and quiet.

"*See the colossal — Watch the tremendous — Come to the gigantic—*"

Have you nothing but superlatives in your vocabulary? Jevons found the mechanical voice setting up a conversation in his mind; he was talking to the overtones, verbally duelling with the mind which wasn't there. And, in a way, he was answered.

"*This IS the biggest! This IS the best!*"

Lights! Sound! (No camera—this is *here* and *now* and *real*). *Action*! Okay, boys, roll 'em! Where? Why the hell should I care? In the hay, maybe. After all, it's up to you. Who are *you*? Why the hell should I care? I'm a machine. But for the sake of argument with yourself, you might be Alec Jevons, ex-test pilot, ex-serviceman, ex-child and ex-husband, ex-this and ex-that, ex-practically everything. Even approaching the ultimate—almost an ex-*man*. But I started out with an advantage. I was *never* human. I don't know what I'm missing.

"—shillings please. That will be five shillings please. That will be fi—"

This is *here* and *now*—remember that. It isn't at home and it isn't three thousand miles away and home is where the heart is except that hearts haven't got anything to do with it, and you know what people are like three thousand miles away—*don't you*? You're supposed to; after all, you've been told often enough. Be a good boy and say *ugh*.

The turnstile clicked, and as if it had been the cradle switch of a phone sounding, the undercurrent dialogue in Jevons's head went with it. The brass-lunged giant had served its purpose; he was inside. Once he was in, he was in, and the giant became aware of

him as a symbol in a memory bank, a member statistic in a profit and loss account. But he no longer heard its voice.

Overhead the rolling way: he could hear it rumble a basso ostinato to the twiddling discordant flashy runs in the right hand which the soprano, alto and tenor cries of the concession-holders flung at random into the night. They offered to scare him out of his wits, to shock him and/or to delight him; they offered to let him prove himself—various things. Kind of them, thought Jevons sourly. To let you pay for admission, pay them as well, and then get you to do the work.

He walked forward blindly into the swirl and whirl of the Fair, down one of the mile-long arteries which bore the life-blood of the machines towards its multiple hearts. The life-blood was money; the people were incidental, ornery, hard to cope with. Money obeyed the rules of statistical distribution, and what you gained upon the roundabouts you lost upon the swings, in general, except when man—the wild factor—decided to be cussed and awkward. Then you changed the rules.

The crowd broke around him like polychrome waves against a granite rock, and that wasn't so bad as a metaphor except that the rock too was moving. It was grey as granite, compared to the humming-bird gaudiness of the flush-faced girls, the black-and-white starkness (implication: efficiency, masculinity, no nonsense) of the boys. He walked straight ahead, which would have been impossible for most people; he attracted stares. For one thing, he was—not young. The other fairgoers were, for the most part. Youth is the hectic time. The remainder were recapturers of youth, busy failing to re-create more than an awareness that they could not stand the pace so well any more, never realising that if the young people they envied could have their elders' self-knowledge and as little false pride they too would have admitted that the pace was less than ecstatically bearable.

They stared for a moment. Then—somehow—they forgot to notice the wrinkles on his face, the grey hairs at his temples, the too-perfect teeth which said almost aloud: *We are false* ! Instead, they noticed his shoulders, and read purpose—incomprehensible, and therefore to be shunned, to be feared, to be hated—behind the watery blue eyes. He looked dangerous. Therefore he managed to walk a straight path through the Fair, which to most men would have been impossible and to all women would have been unthinkable, what with the youths lounging at the corners waiting for a woman to impress, snatch at, crush casually—if their ennui had reached extreme—and toss back as if she were an under-sized fish into the running rolling stream carrying the life-blood of money to the organs of the Fair—to the steam organs, electronic organs, pseudo-human organs like the throat of the shouting

giant who roared out across the countryside his echoing invitation to come and be merry, even if you didn't eat anything but salted nuts and popcorn, and even if you drank nothing but a milk-shake—correction: soya-milk-shake.

Everything at the Fair was expensive, but not prohibitive, for that slowed down the life-blood's trickle—for tomorrow we die, or if not tomorrow then the next day or the next or the next . . .

I shouldn't be here, thought Jevons suddenly. This is a place for people who can't think and must do. I'm a person who can do but must think. Why did I come here, anyway ? Looking for an answer ? And if so, what's my question ? " Lonely, honey ?" Lord above, is she really so bad that she has to solicit right here in the Fair ? Guess she must be.

" Go to hell ! "

And that's liable to be my answer, thought Jevons. If I ever find a question that makes even as much sense as hers.

He reached the base of a spiralling escalator, channeling a flow into the upper level of the Fair—the level of the rolling way which was an entertainment in itself, worth the entrance money alone, if one was young and agile and with fast reflexes. The outer strip girdled the Fair at five miles an hour, but the inmost one was doing fifty. Escalators—laid out flat usually. But you could be bumped if you stayed on more than once around the Fair; the spot on which you stood remembered your weight and incited you to patronise a concession instead of a service. The game was to stay on your feet at a fifty-mile lick after completing the circle.

Or so he'd heard. The Fair had been less elaborate in his young days. Watch it, Jevons ! You're starting to admit your age. (And why not ? Because if you remember that you've been around that long, you admit that you were responsible—this was your doing, this mechanical time-destroying hurly-burly, this feverish seeking after temporary nirvana. *This was your fault* !).

All right, admit your age in terms of time, but not in terms of senility. The spiral escalator wound its challenge at him, and he thrust aside a youth in black whose shoulder bulged with the shape of a gun. It had to be one of the modern plastic models, or the scanners at the gates would have taken it away. Almost too late Jevons flung an acid and unmeant apology towards the muzzle of the weapon where it had suddenly appeared in the boy's hand; the spiral had taken him out of sight and out of range before the whitening finger could close on the trigger, but he heard the scream from the disappointed girl, the gunman's companion: " Whyncha do it, huh ? Whyncha ? Ya think

I wanna be alla time witha bassard who can be shoved aroun' like he was—"

The escalator's inverted peristalsis pushed him out like vomit from its yellow-lipped mouth, on to the upper level, and the Fair was all around him, swirling and breaking like angry water. The noise was redoubled; across the way from him the crowd parted and the source of screaming, frenetic music was plain: a band of girls in minuscule costumes blasting through shiny brass horns, and one thundering out incessant rhythm on a kit of amplified drums. She was fat; she shook. In an ecstasy of concupiscence by proxy a fat old man stared and shook between howling the attractions of his show.

The way scampered past him, a hundred feet broad, in sections. He had had reflexes good enough to put twelve or twenty tons of airplane through impossible manoeuvres fifty feet from the ground—not long ago. As if in a dream he stepped forward, adjusting to the roll and flow of the way like a dancer allowing for a clumsy partner. Ahead, a girl was being bumped for completing her circuit; she rode the writhing spot on the way for ten seconds before it flung her rolling and screaming among the feet of a party of men on the forty-mile section. One of the men gave her a sharp kick, and they were past.

Staggering, the girl started for the edge, and an Uncle in the jester's uniform which made the patrolmen of the Fair a grim joke caught her arm.

" Whatcha mean tryin' ta ride the way when ya know it's for going somewhere else not comin' backa where ya were ?"

The girl was crying, rivers of tears spreading and splotching her heavy make-up. The Uncle turned to throw her off the way, and by that time Jevons had been carried out of sight.

And what's it to you, anyway ? he asked himself savagely, and immediately knew that the answer was in the thrill of the beat of the rollers beneath his feet, in the shudder and grind of the occasional worn, unoiled bearing which punctuated the smooth rhythm of the ride, taking him and sliding its suppleness into the bones of his body, saying do this and do this.

He was sidling across the way towards the fifty-mile strip as if he had been riding the way since he was a child, taking up and absorbing ten miles an hour more at every transition without a tremor or a stumble.

This is the spot, he thought, as he finally steadied on the central strip. Okay; now do your damnedest.

Around him the Fair whirled into a multi-coloured pool of sounds and smells. There weren't many people running the way tonight; a

party of kids around ten or twelve fought on to the middle strip not too far from him, but soon caught sight of an attraction ahead and tumbled away again. Watching them, he was immediately back at their age, remembering how he had come out to watch the construction of this first and greatest of the Fairs, which had been only an amusement park. The scenic railway had been bigger and better than any other; that was the start of it. Now there were others—so many others. A million people a night in this Fair alone, the slogans claimed. A million people on the run from the uncomfortable reality of silence and thought, from the danger of tomorrow, from the waiting death poised above them in the sky—which, mercifully, you couldn't see inside the Fair because it was roofed against rain.

And now admit the blame, will you ? His relaxing body let him get at it and worry it like a dog with a beloved bone, shooting agony through ancient and rotten teeth in the consciousness which was the only justification for the human race, which these people were doing their level best to lose for the space of a hectic, pleasure-filled night.

Where did it all start ? You should know; you were there at the time. Prophesy after the event; go on. It *began* when the first mother comforted her frightened child with some distraction; it went on when men forgot how to grow up, when the bogeymen of childhood became the real man over the sea, the bogeyman who waited all the time to drop atom bombs and nerve gas on the silent, comfortable home—from which, naturally, they fled.

Oh, war was coming; it had been coming for years and years, it had always been coming and always would until it came and no one questioned the fact any longer. As sure as you're born to a heritage of fear, he told a child ahead of him silently, it's going to come. Because people have been told it will for so long that they feel it's expected of them.

And then the end of the Fairs and the beginning of hell—and yet wasn't this hell in some people's books, an eternity of disappointment, of seeking for something which was forever out of reach ?

Escapism. Escape. Get away. *Run*—run the way at the Fair because you might get your fool self killed, and is life worth living anyway ?

All over Britain, a million people a night here, those who aren't lying awake and worrying into the darkness of their rooms, those without a future—they're diving into one everlasting present, they think, only it doesn't last, for dawn comes again and again, and the sun reminds you of the hydrogen bomb and rain reminds you of a gas spray (Shout it ! " Spray ! Spray ! Spray ! " And would they bother, though they've been trained in passive defence and anti-gas

and anti-radiation exercises, the boys and the girls, in the two years they sacrifice on the altar of hate—would they take the trouble to run further and faster than they've run already, which is all the way from reality ?)

Five and a half miles at fifty miles an hour and *whoomp* the floor began to shift under his feet. The bumps started small; they would grow if he did not heed their warning. He was too far away in time—the way had not even been built—and he shifted automatically with the ease of a surf-rider taking a wave.

Well, it began, his mind ran on, and that was all right for a while. It can't hurt to flee to imagination from an imaginary menace; it's losing the battle with something real that makes it so bad.

Shift; turn. No good. Try twisting. But data reveals to the memory bank that the identical weight, plus or minus alterations caused by different distribution of it, remains. A quarter-mile too far. Half a mile.

But they had lost that battle. And it was his fault—his and all the others who should have seen it coming. Who could have taken their lives in their hands and refused to allow the slow growth of the hatred and fear which now dominated (no, not his children—ex-husband, likewise ex-father) these youths and their girls, tarts before they were twenty, but lost and empty and without a future since they were ten.

Three-quarters of a mile too far, and the surface of the way tossing like the Atlantic in a gale, and that man riding it without more than a twitch, an exquisitely controlled adjustment of position.

" Hey, cobbers ! Here's an old cabbage who can really do it ! Come eye ! Say, *lookit* that 'tique-o go, babe !"

A mile too far, and the unheard of, the improbable, but not the impossible: the relays stretched further than the designers had allowed for, the switches closed, the circuits cooled, the floor relaxing into levelness, and the way swirling onwards and onwards, round and round, until it caught up with itself—but it was not a snake, it had no threat of total disappearance hanging over it yet.

" Hey, fatha ! Where'd ya learn to ride the way like that ? Man, I sure wish I coulda done that ! Mister, how come who the hell are say fatha could you use a girl lord above antique you gave me the screaming *What's the big idea buster* ?"

Out of the chattering acclamation of the boys and girls, the shout of an Uncle, his face thunderous with rage and as incongruous with his gaudy jester's dress as the automatic he wore at his hip instead of a fool's bauble. Jevons was suddenly back from railing at himself

and his generation, and there was noise and tinsel reality about him again. One of the youths rounded on the Uncle.

" Go cart yourself, you lousy interferin' crot," he said in a voice as sweet as honey. The Uncle wasn't looking at or listening to him; he was seeing the expression in Jevons's eyes—the look of a ghost compelled forever to haunt the scene of the murder for which he was damned. It was that, that only, which suddenly closed his mouth, damped his jauntiness, lost him again across the flowing writhing track amid the jowls of the concessionaires.

But the girl who hung on the speaker's arm looked up with adoring eyes and told him how clever he was to have driven the Uncle away, and the boy, sharp to collect his advantage, was gone with her to seek the darkness of a corner where the only intruders would be other couples bent on the same errand. The others clamoured at Jevons, praising him, making his mind squirm with the effusiveness of their hero-worship.

" Guess you old-timers can still show us a thing or two," said one of the girls—the one who had offered to ditch her boy for Jevons—with reluctant affected candidness; begging, pleading to be shown a thing or two her boy was too young to have learnt to do properly, and he felt suddenly sick.

So he had beaten the machine, the brain of glass and germanium and copper which poured out the endless river of the way. *So what* ? Take your praise and stick it—well, anyway. Show you a thing or two, sister ? (Daughter, more like). You wouldn't understand what I'd like to show you; you wouldn't want to. He rebuked himself for accepting their hollow plaudits even for a fraction of a second, and their cries rang like curses behind his head as he swam blindly back across the river of mankind towards the bank, the solidity, the beach of the concessions.

" *Come and*—" they blasted at him. " *Do you want to*—" they screamed at him.

All right; so we began by running from the enemy who never showed his hand. That was twenty-thirty years ago. We hated him: first because of the things we were told he was going to do, then because of the things he hadn't done after all. What heroism is there—what medals are there to be won—what glamour is there in a war which has never been fought, in a war which when it is fought will be a hell with all the appurtenances—roasting flesh and slow torment for every-one ?

God-damned lousy stinkin' miserable son of a—foreigner . . .

" Sorry, Jevons. You won't be needed any longer."

"*Why*?"

"Well, your mother—"

Okay, so she was naturalised. Laughing boy is half-foreign; would those kids have smothered him with praise if they had known? If he had addressed them in the language he had spoken fluently before he could mumble a word of English? Would the Uncle have retreated? Would the gun on his hip have stayed in its holster? Not on your sweet life!

"I'm sorry, Alec, but you can't expect me to go on. You haven't got a job now. I'm leaving you—and that's flat!" ("And I'm going to sue for divorce because of non-support"—only she hadn't said that, though it was already in her mind).

Would that longing-eyed girl have offered herself body and—well, whatever she kept under that thatch of dyed hair? Never; there would have been the horror waiting a few years ahead: "Sorry, Miss—"

What the hell would her name be, anyway? A good sound British one, that's for sure. Say Smith. "No, Miss Smith. We find that five years ago you—uh—associated with a man whose antecedents were open to suspicion."

Clang! went the iron gate in his mind; perhaps by that time it would be the entrance to a prison. Now, as yet, it was only the gateway to most jobs, all government posts, all privileges . . .

Begin by hating the man across the sea. There's no reason for it—there doesn't have to be. If you don't need a reason for hating somebody, why stop there? Why not hate the man next door? It's just as valid.

There was a concession down there on his right which had a less garish, less noisy display than most, but it was big and the posters were subtle. He was drawn towards it, aimlessly, unthinkingly.

It was popular; as he came up, the doors opened and the crowd moved out, seeming replete, seeming subdued by what they had been through: no screaming, laughing, giggling . . . What did they have done to them in there? Have the guts frightened out of them? That was the sort of thing they might call fun: to run, masochistically, from a world of fear to a world of fear.

He raised his head and read slowly down the wording of the nearest poster, and at the end of it he said to himself, well, this is it. This is the ultimate betrayal. This is THE END, and you, you brass-lunged giants, can shout it for the world to hear.

The poster said—and quite quietly, in restrained lettering (which was wrong: the end of the world should be announced in bold-face type and in preference on paper edged with mourning black) *Be*

someone else ! Who do YOU want to be ? A test pilot—movie star—big game hunter—deepsea diver—GREAT LOVER ! ! ! !

The picture showed a dozen unlikely dancing girls performing for a grinning all-British youth in a turban.

There was a man in a dark suit on the platform beside the ticket-booth. He was an odd barker. He used no pitch (touch a barker's pitch and be defiled, put in Jevons's mind irrelevantly). He didn't have to; the posters were enough to keep the flow going.

This was what had been going to eliminate movies and TV, Jevons remembered, before the Fairs took away their trade by offering both wrapped in a giant economy-sized package. He had heard about it. Total sensory identification was what they had called it. They used it for training intelligence agents, to find out who would break fastest under what kind of interrogation, to dress a man in another personality. Totsensid for short. Totsensid. Trade name. Joke.

And here it was, fouling the comparatively clean air of the Fair. Here is the last word: we save you *all* the trouble. Get out of your body as well as your worries. Don't be yourself—you're a slob anyway. Be someone bigger and better and more successful, and when it's all over, everybody will be one person and we'll change his name to Adam and this is where we came in.

" Next house just starting, sir," said the barker who was less like a barker than any other concessionaire at the Fair. " Why don't you come in ? I can assure you it's very popular, our show."

It would be, thought Jevons sourly. How to ' get away from it all ' without even taking the trouble to *go*. Yes, and why shouldn't he take a basinful ? You've come to expiate your sin, haven't you ? Your sin of omission ? You're here to take part in the hell you've bequeathed to the younger generation; how can you stop now ?

He nodded wearily. " Yes, I'm coming in."

The room held about a hundred couches, singles, and quiet ushers divided the customers, men on the right, women on the left of the centre lines. He saw a man (?) begging an usher to let him (?) go where he (?) wanted, and red-painted fingernails flashed as he tried to press a banknote into the usher's hand. The usher looked sick, and Jevons felt sick; he dropped himself uncaring on a vacant couch and looked at the brain-box which he was supposed to slide his head into. All done without mirrors; equally, without screens or cathode-ray tubes—with only the senses of the people taking part.

Then the lights were out and a voice from nowhere cried to the audience to press their heads into position and he did so and he was no longer Alec Jevons—

But he was back in the cockpit of a plane, and it was a sweet piece of machinery at that. It had a surge of power when he pushed the throttle open which flattened him against his seat; he felt the familiar swell of the g-suit, pressing the blood away from his limbs as he hurled the plane into a tight turn.

The illusion was perfect, and it struck a chord deeper than he had known existed in him. Oh, to be back where I came from ! he cried out, realising with a small part of his mind that he wasn't *really* here but content to lose that knowledge—

And yet that was running away, too. What had he liked about the high and lonely reaches of the air, up there with the stars ? Nobody else. No more milling yelling seething humanity.

And it was over, and he was sweating. So that was why he wanted to get back into a plane which no one would ever use in the war which was not going to come, instead of being down here on solid ground trying to put right the effects of those same sins of omission he was running from.

The next one was equally perfect, and he was married. He was just married. But married according to some ceremony which was foreign (and the word came with a bang up to his consciousness, and he didn't care because it was the happiest day of his life and there was a splendidly pretty girl waiting for him when night fell, and she reached out to him in the doorway of their hut (*hut* ?) with her teeth standing out brilliantly in her black face (*black* ? ? ?) and he looked down in growing astonishment and found that his skin too was black and he didn't give a damn because the sensory effects were going all the way. All the way. All—the—way . . .

And the lights were on and people rose slowly, satedly and worriedly from the couches, as if there was something wrong they couldn't quite place, and yet with quiet satisfaction, and there was a sudden tenderness in the way the youths went to meet their girls again, girls they had quite probably never seen before they picked them up tonight. He sat for a long time on the edge of the couch with his head in his hands, until an usher tapped his shoulder.

" Do you want to stay for the next house, sir ? It's a complete change of programme, you know—but we have to insist on a separate payment for each performance—"

" Yes," said Jevons with sudden decision. " Yes, I'm staying." The money he paid out represented his supper for tonight, now he was on the dole, but hell, he had put his finger on something and he wanted to make sure what it was.

Few other people had stayed. Few others who had been a test pilot—this evening—and a coloured bride or bridegroom, dived with him into the eerie green-blue wastes of a Pacific pearl-fishery and became a Malay dying slowly of an overtaxed heart and overtaxed lungs and ruptured eardrums and starvation. It was not pleasant, but it was *real.*

Afterwards he had just been married by a ritual he did not recognise but which he guessed might well be Jewish, and the girl he had married called him dearest in the flat-sounding syllables of Russian, which he understood through the brain-box quite well.

It was that which made him gasp, and which cleared his mind and brought him up fiercely from the couch with complete disregard for the fate of the brain-box he tore off and sent him up to the nearest usher to demand who was in charge.

" In charge, sir ? The man you'll find on the stand in front of the concession—he's the manager."

Jevons had gone before the usher had finished speaking, and was clawing at the sleeve of the man on the stand—the barker who was not like a barker. " How did you think of this ?" he asked almost savagely, in fear lest this hope should be denied him.

The barker gave him a long slow thoughtful searching look and said, " You are a very intelligent man, Mr—"

" Jevons. Alec Jevons."

" How do you see it, then ?"

" You're teaching these people about the men and women they hate because they think they're different. They come out realising that an African and a Russian—"

" And an American and a Chinese and a Malay—that's as far as our range goes at the moment—have exactly the same—"

" Feelings and emotions, pleasures and troubles, as themselves !" Jevons finished the sentence in a flushed rush, colour boiling to his face with excitement, pouring over his words.

" Very clever of you, Mr. Jevons," said the barker. " You are the first customer who has realised."

" But—the Russian sequence in particular—how did you get it past the censors—and the sex, too ?"

" This is a government-sponsored concern, of course. Surely you didn't think totsensid was a process a private firm could market ? The sex, I admit, is a bait—but you noticed it was *not* the cheap kind you pick up on the edge of the way at a Fair."

Jevons's heart was singing a silent paean of rejoicing; he chuckled, and it threatened to boil into hysterical laughter.

" We don't often get people here as—old—as you," the barker said. " It's tomorrow we're interested in, not today. We've spent too long making a mess of the world to put it right in a hurry, but we've made a beginning. The brotherhood of man is on the way, as we usually say. Yes, *both* sides of the Iron Curtain." He eyed Jevons's untidy clothes. " You could be one of those who helped it along, if you want. Need a job ?"

Jevons had started to say yes, when he remembered. " A government concern ? They wouldn't have me. My mother was naturalised —that's why I was thrown out of my last post."

" Don't be a fool," said the barker flatly. " What do you think we're trying to get rid of ? Report tomorrow morning at seven, will you ? I'll have it fixed by then. S'long."

Back across the way, back down the spiral, back through the turnstile, back to the world in which there was a sort of hope after all, back to the reality in which there would *not* be hell, there would *not* be war, and the Fairs would vanish because life would be worth living instead of foreboding.

The turnstile clicked; the conversation began again, only this time Jevons was echoing instead of arguing with the brass-lunged giant.

" *This IS the biggest* !" shouted the giant. " *This IS the best* !"

And in Jevons's heart a small voice loaned the machine the humanity it did not possess. " This *is* the biggest !" Jevons shouted happily to the world. " This *is* the best !"

Keith Woodcott.