NEW WORLDS
SCIENCE FICTION

No. 23

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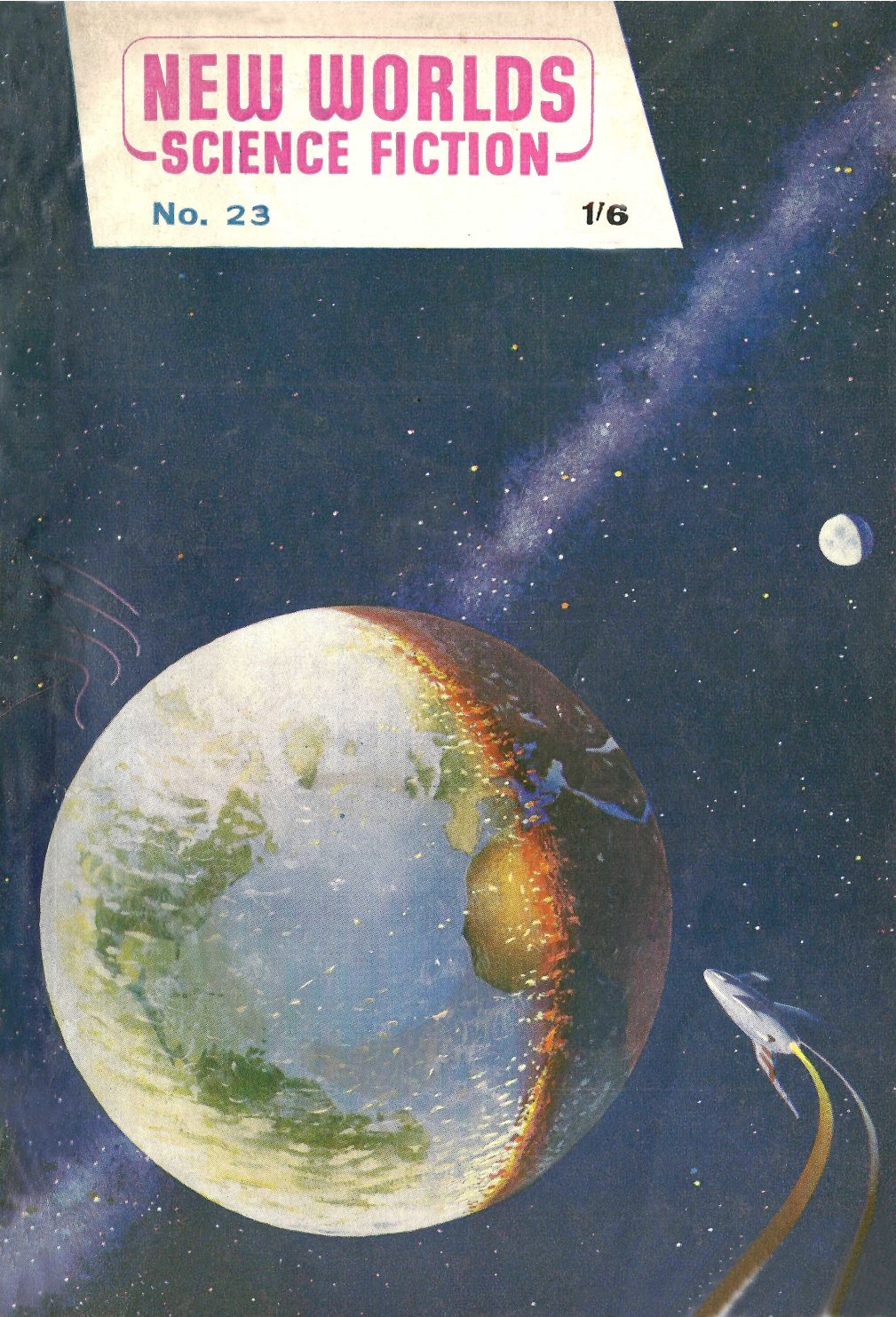
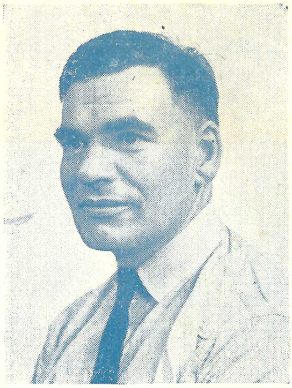


NEW WORLDS

PROFILES

Alan Barclay



A Scotsman, educated in Edinburgh, holding a degree in Civil Engineering, he is at present a lecturer on engineering mathematics and field astronomy in an English University. For much of his life he has done practical engineering upon bridge construction, tunnelling, compressed air work and hydrographic surveys. Commissioned in the R.A.F. during the war he worked on metallurgical and ballistics problems.

He confesses that his lectures occasionally contain references to escape velocity, artificial satellites and space ships.

Although he claims to have read practically every science fiction story published since Wells' '*The Sleeper Awakes*,' he turned to writing to appease his increasing appetite for this type of story, and fits it in between technical articles and features upon caravanning—his other major hobby which is backed by a large sports car, a touring caravan and a 16 mm. movie camera.

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CONTENTS

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Prediction . . .

The number of technical books being published concerning the problems to be surmounted before Man can safely journey to our nearest neighbours in space are increasing steadily, and a close study of their contents show that we are at last moving from the field of theory into that of actual " fact "—many of the authors who have contributed to the present cycle of " interplanetary " books on the market have taken part in experiments (perhaps at White Sands, New Mexico, or elsewhere according to their specific field of investigation), and are acknowledged experts upon one or more subjects necessary to the study of astronautics. It is, therefore, particularly interesting to discover statistics which give us a rough idea just *when* space travel may be expected.

In what year do you think the first unmanned missile will be successfully landed on the moon ?

In what year do you think the first manned flight to the moon or another planet will be attempted ?

These and other searching questions relating to space flight were recently asked of more than sixty leading men of science and science fiction in a questionnaire sent them by Mr. Gerry de la Ree of River Edge, New Jersey, of which a condensed report of the results was later published in the *Bergen Evening Record* of New Jersey.

The Poll statistics revealed some widely divergent and interesting opinions upon what must still remain a speculative theory, despite the known scientific factors to be taken into consideration, and even amongst those asked there was one well-known author who thought interplanetary flight would never be accomplished !

Apart from the leading science fiction authors and editors, for whose inclusion Mr. de la Ree states ". . . these men could well be termed ' professional prophets '. . . they have, figuratively speaking, been to the moon many times (and) a number of them boast excellent educational backgrounds and are well versed in science,"——there were many of America's foremost technical men: Dr. Werner von Braun, Dr. Heinz Haber, Dr. R. S. Richardson, Dr. Donald H. Menzel, and other academicians, plus such experts as Willy Ley, Arthur C. Clarke, G. Edward Pendray, Alfred Africano and R. L. Farnsworth.

Predictions at unmanned flight, while ranging from 1955 to the year 2000, showed an average of 71.4% in favour of the attempt happening prior to 1975, and for manned flight 73% anticipated it would take place before 1990. However, it is the additional comments given by many of those who answered the questionnaire which are of primary

interest to readers. Willy Ley feels that an unmanned missile could have been started in 1945 or 1946 and would have been a reality by now, but " the general feeling seems to be that we won't learn enough from such a shot to make the expense worthwhile." Fletcher Pratt together with many others, feels that the projects in general would only be of interest to the Armed Forces, and John W. Campbell, jnr., rightly states that answering the questions is " necessarily a guesswork job," and believes " that the present line of official research—rockets—is a blind alley."

Dr. Thomas S. Gardner's summary states: " Money spent on guided missile work does *not* hasten the day of space flight to any major extent. One billion a year (dollars) on *space flight*, such as an orbital station, etc., would put us on the moon in five to ten years. In the event of an atomic war in the next ten years, it may be centuries before we get to the moon—— or never."

Asked if they believed atomic power would be used to propel the first passenger-carrying space craft, 42.9% answered " Yes," but 49.2% replied " No," while numerous suggestions were put forward as to the type of fuel which might be used. 54.7% thought the United States would sponsor the first interplanetary flight.

The questions themselves are far more intriguing than the theoretical answers given, because so many unknown factors have to be taken into consideration—your guess could be as good as the technicians. As far as we know, no one nation, scientific body or philanthropic group are devoting themselves solely to the development of space flight, although many subsidiary experiments are taking place which can and will have a direct bearing upon extra-terrestrial flight, whether manned or entirely mechanical. Guided missile experiments by world Powers are already relaying vital information upon conditions outside the Earth's atmosphere and narrowing the field of suitable fuels which can be used. Meanwhile, the development of atomic power for peaceful ends may still come up with a more suitable power supply than the combustible liquids at present visualised. Radio, radar and astronomy are integral parts of man's forthcoming first step into outer space, for communication and navigation, and engineering in all its aspects for the building of suitable ships and a space station. But the list could go on almost unhindered, for it appears that all the requirements for space travel are already departmentalised.

It needs but the co-ordination of them all on an international scale for the advancement of humanity as a whole—or to prove conclusively that the one lone author was right in the first place and Man will never survive outside the narrow limits of his present existence.

John Carnell

Mr. Chandler has long been noted for his stories of other worlds and alien conditions against a background of space travel modelled on present-day shipboard life. This one is no exception. It starts with a casket being brought from Mars to Earth—just an ordinary coffin containing a body for decent burial . . .

ZOOLOGICAL SPECIMEN

By A. Bertram Chandler

Illustrated by QUINN

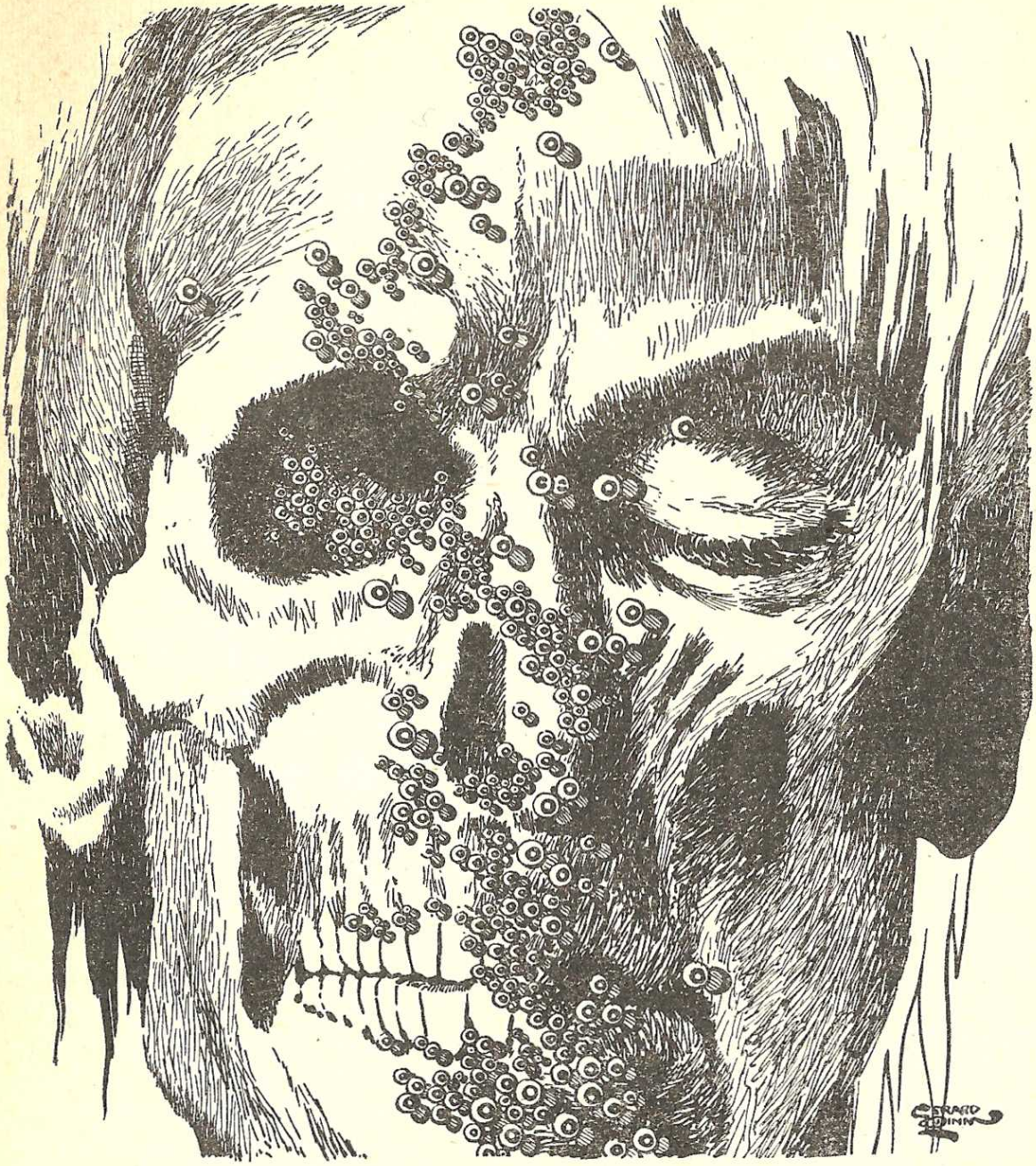
The drive had been cut, the ship had been put into her slow spin around her longitudinal axis, the passengers were settling down nicely and everything in the garden, I thought, was lovely. Eight months of free fall lay ahead—eight months in which to square up the inevitable paper work (and this should take only a week at the outside), in which to keep the passengers happy with organised fun and games, and to read all the various classics which, so far, I'd never got around to reading.

At 0.800 hours Twayne, my Number Two, took over the watch.

" Here you are," I told him. " We're here. Deep Space conditions. Screens blank as a first trip cadet's mind—except for Mars, of course, but what's astern won't worry us. Nary a comet, nary a meteor. Spin set for half a G. If in doubt, call the Master. O.K. ? "

" O.K." he said.

I waited until he had strapped himself into the other chair, then knocked up the clips that held me into mine. I dropped through the well to officers' flat level, pulled myself into the radial alleyway leading to my room. Once inside I stripped off, went into the little shower cubicle. I enjoyed the shower. The water had a sting, a freshness, that's altogether lacking when you're a month out from port, when you're using water that's been used and re-used thousands of times before. Oh, I know that there's no difference in theory, I know that



distilled water is much better for washing, anyhow, I know that any lack of freshness, or seeming lack of freshness, is psychological rather than physical, but . . .

Anyhow, I enjoyed my shower, and I had my shave, and was just about to climb into a fresh uniform when Captain Gale came in. He had a sheaf of flimsy papers in his hand and a look of grave reproach on his normally good humoured face. He sat down heavily in my chair, the springs creaking in protest. He said, in a bad tempered voice, " Mr. West, you should have told me."

" Told you *what*, sir ? " I asked.

" *This.*" He took one of the sheets—it was, I saw, part of the Manifest—threw it down on to my desk. Leaning forward in the chair he indicated one of the items with a stubby forefinger.

I looked over his shoulder.

One Zoological specimen, I read. *Weight*: 20 *kilogrammes*. *Measurements*: 2.5 x 1.25 x 1.25 *metres*.

" Oh, yes," I said. " I had it stowed in Number 6 bin, and had the springs rigged. Judging by its size, it could be a sand hog. I don't know how it's been prepared—I'd say it's stuffed, it wasn't freezer cargo—but the bones are flimsy. I . . ."

" Sand hog ! " said the Old Man. " *Sand hog* ! "

" But the size . . ."

" Mr. West," he said, " if it were a sandhog, it would be declared as such on the Manifest. Don't those dimensions suggest anything else to you ? "

" No. Unless . . . It could be a whole crate of sand worms."

" *Sand worms* ! " he snarled.

I buttoned my shirt, climbed into my shorts.

" I don't see . . ."

" You wouldn't. Puppies flapping around Deep Space before they're weaned. Well, I suppose I have to tell you—and I warn you now that if you let out so much as a squeak of this to the other officers or the cadets—or the passengers—I, personally, will have you blown out through the drivers in small pieces.

" Mr. West—do you know what a euphemism is ? "

" Yes. The use of a nice expression for one not so nice."

" Good. ' Zoological Specimen ' is a euphemism. It's been used aboard ships over since Noah's Ark—although I don't suppose that Noah himself used it, his cargo was nothing else but Zoological Specimens. It's used because seamen, and spacemen, and passengers, are apt to be superstitious. It's used because, for some absurd reason, people don't like sailing shipmates with a corpse. And a corpse is what we've got. And you and I, West, are the only two who know about it. And we'll keep it that way."

" But the weight, sir . . ."

" They usually use lead coffins for these jobs," he said.

" But the freight . . ."

" Somebody," said the Old Man, " whose relations have more money than sense, died on Mars. Somebody has to be tucked away in the family vault, expense no object. Somebody has to wait until poor old Muggins Gale blows in with his decrepit old *Marsova* so that the disgusting cadaver can be wished on to him. Somebody has to wait until Muggins Gale goes away to the Green Mountains for a few days hard-earned leave, knowing full well that his dim-witted Mate will take every gramme of cargo, no matter how objectionable, that's wished on to him. Somebody . . ."

"The Agent should have told me, sir," I pointed out.

"He should have done. And next time in Braunport I'm having a very large piece of him. Well—you'll know in future."

"That sounded like the breakfast gong, sir."

"It was. Remember, West, not a word of this to anybody."

"Not a word, sir," I promised.

My three passengers were at my table when I got aft to the saloon. Kennedy, the newsman, I had met before—in about every bar in Marsopolis. Trainer, a mining engineer, was a stranger to me, as was Lynn Davies. She looked like one of those long legged blondes who, in scanty attire, hand top hats and magic wands and such to conjurors, the while distracting the attention of the customers from any sleight of hand. And that, I learned, was just what she was—she had been involved in some disagreement with the manager of the troupe of entertainers with whom she was touring the Martian cities and settlements and, at his expense, was being shipped back to Earth.

"Hiya, West!" Kennedy greeted me. He introduced me to the others. "That was a nice quiet getaway," he said. "You're to be congratulated. Hardly felt a thing."

"I did," grumbled Trainer. His thin, lined face had a yellowish pallor. "And I really can't see why the air has to be so thick."

"Trainer's a local boy," said Kennedy. "A real Martian. Born and bred on the celestial dust bowl. What about you, Miss Davies?"

"It didn't worry me," she said.

"Frankly," Kennedy went on, "I was surprised. We have a deadly combination here—Captain Gale and Chief Pilot West. Their blasting off technique has been described—and justly—as a westerly gale. Would it have been something in the cargo, West? Something—fragile? I was nosing round the ship, you know, while she was loading, and I saw your boys rigging the acceleration springs in one of the bins."

"Did you? Well, I'm peckish, folks. Shall we see what they have for us?"

We picked up our trays, walked to the long cafeteria bar, made our choices. "Make the most of the fresh food," I told the others. "We'll be getting vegetables and salads all through the trip—but in a week or so we shall be relying upon the processed yeasts and algae for protein"

"One would think that these ships could carry meat," said Kennedy. I didn't like the way that he accented the last word.

Spaceships have often been likened to sailing ships, mainly I think, because both made long voyages. But it is, in many ways a false analogy. When the old windjammer pulled out on her long drag round the Horn those on board knew that they had a sporting chance of making a quick passage—a combination of skilful Captain and sheer,

blind luck could shorten the trip by weeks. Then, too, those on board, crew and passengers, had much more to break the monotony than has the interplanetary voyager. There was the occasional passing ship, now and again the sight of land, and always the changing sea and sky. The spacefarer is better housed, better fed and far more pampered than was ever the seafarer, but the oft breathed air is stale, the too often used water is flat, and there is no other scenery than metal bulkheads, and ship fittings, and the emptiness outside at which it is not good to look. People, in the spaceship, bulk bigger than ever they did in any other form of transport. The ship, for most of her voyage, is no more than a huge projectile, dumbly obeying the laws of ballistics, over the movements of which the crew exercise a very limited degree of control.

Much of my time was taken up by organising, in conjunction with Helen Rand, our Chief Hostess, various sports and games to alleviate the boredom of both passengers and staff. There was a darts tournament, and a table tennis tournament, and all the usual card games. There was the inevitable moment—it comes on every voyage—when our Chef downed tools and said that he'd like to see some of the people who were so fond of criticising do any better with the limited range of materials to hand. There was the cooking competition, open to anybody, but for which there were surprisingly few entrants—cooking for a family is one thing, cooking for over sixty people is something else again. There were concerts. There were bull sessions at the bar. There was the formation and the breaking up of cliques. There was gossip, and there was scandal. And, unknowing, uncaring, the ship fell on and down to Earth's orbit.

For the first few weeks Kennedy kept out of my hair. He had innumerable notes, made on his Martian tour, to lick into shape. Except for meals, he kept to his cabin, and the faint clicking of his lightweight portable typewriter could be heard at all hours of the arbitary day and night. Trainer, the mining engineer at my table, was a very dull manger companion, his conversation consisted of little else but complaints. Lynn Davies was more interesting—her stories of show people were always entertaining. And she threw a wicked dart and, with her as a partner, I got as far as the semi-finals in the table tennis tournament.

Then, one day before lunch, Kennedy walked into my room. Twayne was there, and Vera Kent—one of the Assistant Hostesses—and Lynn Davies. We were enjoying a quiet pink gin.

"Any for me?" asked Kennedy, helping himself to a glass and the gin bottle.

"We're rationed, you know," I told him.

"Have one with me at the bar before dinner," he said. "Here's to crime."

" Have there been any good ones lately ? " I asked.

" Funny you should ask," he said. " As a matter of fact I've been sorting out my notes, as you know. This affair—the one that I'm telling you about—was rather outside my ambit, but I was knocking around a great deal with my Martian opposite numbers—do you know Graham of the *Press* ? He's their crime reporter—and looked in on the whole business. It had all blown over by the time that you got in, but perhaps you remember the Latimer case, Miss Davies ? "

" I do," she said.

" This Latimer," Kennedy went on, " was an archaeologist."

" He wrote ' *The Sleeping Cities*,' didn't he ? " I asked.

" Yes. Queer book. Disturbing, rather. I suggested to my big white chiefs that since I was coming all the way to Mars I might interview Latimer, and they told me that should they ever consider setting up a stall in the nut market they'd let me know, but until such time came about I should try not to confuse the news pages with the comic strips. Anyhow, this Latimer got himself bumped off, on the site of one of his digs. No injuries, either external or internal. No blunt instruments. Nothing to suggest a dicky ticker. No expression of frozen horror on the face or in the staring eyes. Just—dead. Stopped. It hadn't been sudden. He'd had time to scrawl a few words in the sand with his gloved finger. He'd written, in clumsy block capitals, THEY ARE GO . . . And then somebody, or something, had brushed out the rest of it. His assistant says he saw, or thought he saw, a shadowy sort of creature scuttling away into the ruins."

" A sand hog ? " suggested Twayne.

" No. Not according to the account. It was too small, much too small. And it wasn't a sand worm either. It had legs."

" Imagination," I said.

" Wasn't there something funny about the autopsy ? " asked Lynn Davies.

" Yes. What was funny about it was that there wasn't one. Old Wallis, the Chief of Police, wanted Latimer taken apart to see what had made him stop ticking. But there was a frantic message from Earth, from the old boy's only surviving sister, making it plain that she wished to receive her dear brother's corpse intact so that he could be laid to rest in the family vault. There was some silly business about a mess up at the Resurrection if parts of him were on Mars and parts on Earth. And you know, as well as I do, how much power these minority religious groups have these days. So poor old Latimer was shoved into one of those fancy, hermetically sealed containers, just as he was, and there he'll stay in his nice, inert atmosphere of *mortican* gas until such time as he is delivered at his sister's front door and she opens the casket up to gaze for the last time on the features of her beloved brother."

" What was the sister's name ? " I asked casually.

" Let me see, now. Hendrikson. Mrs. Phoebe Hendrikson."

" Would she be a Zoologist ? " burbled Twayne. " We've a specimen, special stowage, consigned to her."

I nudged him hard enough to spill his gin, but too late to stop him from spilling the beans.

" I don't see why you had to bother with those acceleration springs," said Kennedy. " I don't think that Latimer is going to feel any jolts."

So the cat was partly out of the bag. Twayne and the Assistant Hostess could be told to keep quiet about it all, Kennedy and Lynn Davies could only be asked. And then I had to go and tell Captain Gale about it all. He took it rather better than I had anticipated, seemed pleased, rather than otherwise, to learn the identity of the corpse.

" You know, Mr. West," he said, " I should have counted it a very great honour to have carried Howard Latimer were he still with us . ."

" He is with us, sir. Very much so."

" You know what I mean, West." He indicated a book on his desk. " Oddly enough I'm in the middle of reading his ' *The Sleeping Cities.*' He had something, you know. His interpretation of the hieroglyphs, fantastic though it may sound, seems to make better sense than the more orthodox ones. After all—we've found the ruins, and we've found the artifacts, but never a fossil, never a mummy, nothing at all to let us know what the old Martians were like. They're sleeping somewhere, Latimer said. They're sleeping, waiting until some unheard of climatic cycle restores air and water to Mars . . ."

" Once the air and water have gone," I said, " they're *gone.*"

" Well, then, waiting until some mugs of outsiders restore the air and water for them."

" If their science was as good as all that, sir, then surely they could have built themselves rockets and made the voyage to Earth or Venus."

" Perhaps their science ran on different lines to ours. Just for the sake of argument—suppose that they specialised, say, in biology and psychology. What use would that knowledge be in developing space flight ? "

" We had to use plenty of each."

" M'm. Yes. Anyhow—impress upon Twayne and Miss Kent that they aren't to breathe a word of this Latimer business to anyone. I'll see Kennedy and Miss Davies myself."

I still don't know who was responsible for the leakage—but leakage there was. I don't think that it was Kennedy. I'm almost certain that it wasn't Twayne. It wasn't Lynn Davies. For my money it was Vera Kent. Whoever it was didn't really matter. It was the Chief Pilot—me—who was blamed.

At first the Old Man didn't think that it was such a bad thing after all. It gave the passengers—and the staff—something to talk about, took their minds off the malicious gossip and scandal. And it provided material for at least three Brains Trust sessions on the old Martian civilisation, in the course of which some good sense and a deal of fantastic nonsense was talked.

So, for a while, for an arbitary week or so, all went well. And then, subtly yet unmistakably, morale began to deteriorate. One cause of this was a silly woman among the passengers, a psychic, *she* said—a charlatan, I would say. Madame Kapitza she called herself (Lynn Davies, who knew people on the fringes of show business as well as the legitimates, said that her real name was Smith). Anyhow, this Madame Kapitza insisted on holding a seance. And with whom should she get in touch—after, of course, formal introductions by her Spirit Guide—but the ghost of Howard Latimer. Yes, said Mr. Latimer, it was beautiful where he was, and he was very happy. Everybody—or every spirit—was very happy. But . . . He didn't like his sister, he was alleged to have said. He didn't like the family vault. He had been taken away from his life work, on Mars. He would suggest, respectfully, that Captain Gale turn the ship around, build up acceleration in the general direction of the Red Planet, then consign the coffin and its contents to the deeps of space. He, Latimer, would see to it that it made a landing on Mars, in the vicinity of one of the Sleeping Cities.

None of the staff attended the absurd attempt at ghost raising—I got the whole silly story from Kennedy and Lynn Davies. "I could have done better myself," said Lynn. "I may be only a conjuror's assistant, but I've learned a few tricks. You should have seen it! That phoney ectoplasm! She'd never have got away with it on the stage!"

The Old Man wasn't at all pleased when I told him of what had been going on. He couldn't very well stop it—as I have said before, the laws protecting religious minorities are very stringent and Madame Kapitza had only to raise the cry of "Persecution!" to get us all into very serious trouble. All that he could do was to invite the big, fat "medium" up to his room for cocktails and try to persuade her that she must, somehow, have got the wires crossed and that it was Latimer's dearest wish to be buried on his home planet. The doubling of her personal liquor ration helped to persuade her that this was so. "Thank God," said Captain Gale to me afterwards, "that there're more than one kind of spirit!"

The next piece of minor unpleasantry was the delegation of passengers, led by Trainer, who maintained that the body carried the germs of some hitherto unknown Martian plague and that it should be incontinently dumped, in the interests of both the ship and of the human race in general. The answer to this demand was an uncompromising No—and there weren't any free drinks involved either.

Then, as was reported by our Surgeon, there was an outbreak of unidentified and unidentifiable aches and pains, all of which must be, so said the sufferers, symptoms of the unknown plague.

Still—we coped. We had to. We crammed more organised fun and games into a day than the average passenger ship sees in a week. We posted a permanent watch of cadets on the door leading aft to the cargo space, this was after Trainer, accompanied by Kennedy and Madame Kapitza, had been caught trying to pick the lock with a piece of cunningly bent wire.

Kennedy was unrepentant.

" After all," he said, " this is news. Or it's the nearest we get to news in this tin coffin dangling in hard vacuum. I just wanted to see the old boy, slung there in his casket in his spider web of springs."

" You could have asked," I said.

" All right. I am asking."

" I'm having my weekly routine inspection of the cargo space tomorrow, subject to the Master's approval, you can come with me. You won't see anything."

" I'll come, all the same."

" Subject to the Master's approval."

Rather to my surprise, the Master did approve.

And so, at 10.00 hours, carrying keys and torches, Kennedy and I pulled ourselves aft along the well to the big circular door. The duty cadet helped us to open it, to hook it back.

There wasn't much to be seen. From the central shaft the radial alleyways ran out to the skin of the ship, and between the alleyways were the cargo bins. Kennedy showed interest in the shipment of whisky, the securely lashed and chocked casks whose contents, having made the round Earth-Mars voyage, would be sold at fantastic prices in the more ritzy bars of Earth.

" I never could tell the difference," he said. " But it's a good racket."

" So are these dried sand worms," I told him. " They're worth their weight in platinum in Shanghai. Pickled ones in this bin—it's claimed that acceleration, deceleration, radiation and all the rest of it complete the maturing process."

" To hell with pickled sand worms. I want to see a pickled archaeologist."

" All right. Number 6 bin—where are the keys ? Ah, here we are."

I unlocked and opened the door, switched on the lights. There wasn't much to see. There was just a wooden case, with stencilled marks and numbers, suspended in the cunningly devised network of fine, steel springs.

" I don't like the way it's quivering," said the newsman.

" It's bound to quiver. There's always vibration in a ship—generators and other auxiliary machinery, even people walking around.

Look ! " I stamped hard on the web frame on which we were standing. The big case shook in its web like an infuriated spider.

" What was that noise ? "

" Come off it, Kennedy. You're as bad as that old bitch Kapitza. Haven't you ever heard springs creaking before ? "

" M'm. Yes. But . . ."

" Whoever oiled the springs last didn't make a very good job of it," I said. " Well, that's all."

" O.K." said Kennedy. " Thanks."

We locked the door—and I don't mind admitting that I wasn't sorry to hear the clicking of the wards. I'd rationalised the quivering mentioned by Kennedy—but I'd failed to convince myself that it was due to ship vibration. I'd carried cargo in special stowage before, but never before had I noticed that much motion in the spring webbing. That must have been, I told myself, because I'd never been looking for it.

As we pulled ourselves back for'ard along the central well I had to fight hard to prevent myself from looking behind. My feeling of unease lasted until I was invited to stop at the bar by Kennedy. A second stiff whisky chased the formless fears out of my mind—for the time being.

Then there was the business of Minnie. She was the ship's cat and was, I think, senior to any of the human staff in years of service in the one vessel. In spite of her habit of having her kittens in both unsuitable and highly improbable places she was regarded with both toleration and affection. She was—as cats can be—a person.

It was at 04.30 hours, Greenwich and Ship's Time. I'd taken over the watch from young Welby, the Third Pilot, and was relaxed in the pilot's chair, sipping a bulb of hot, sweet tea. There was nothing on the screens—nothing of immediate interest, that is—and all the meters were showing just what they should show. Rawson, Senior Cadet and my junior watchkeeper, was making his rounds and would shortly be along to report all well.

He was along shortly, but not to report all well.

He looked upset about something.

" Well ? " I asked.

" It's Minnie, sir."

" What about her ? She can't be having any more kittens. Not yet. The current issue's only just got its eyes open."

" She's . . . dead."

" What ? Dead ? Minnie dead ? "

" Yes sir. You know that little alleyway by the linen locker, where Minnie has the box with the kittens in it. I looked in there, just to speak to her, and I found her dead."

" Who did it ? If I find out . . ."

" I don't think it was anybody, sir. There weren't any marks. But it looked as though she'd been fighting something, trying to keep it away from the kittens."

" Were they all right ? "

" Yes."

I finished my tea, filled and lit my pipe. I remembered, suddenly, Trainer and his absurd story about unknown Martian plagues. It scared me.

" Rawson," I said, " go to your room, and scrub your hands—I suppose that you touched the poor brute. Scrub your hands thoroughly. Then go and give the Surgeon my compliments, ask him to examine the body. I'll call the Old Man."

Captain Gale awoke almost as soon as I buzzed him.

" Yes ? " came his irritable bark through the telephone. " Yes ? What is it, West ? "

I told him.

He didn't waste any time by wanting to know what the hell I meant by calling him out at this hour of the morning over a dead cat. He just said that he'd be on the bridge at once.

Clad in his dressing gown, he was with me in a matter of seconds. He took the other chair. He told me to carry on smoking, poked tobacco into the bowl of his own pipe with a stubby forefinger and lit up. I told him what had happened, what I had done.

" You were right," he said. " No matter what the cause of death, we can't afford to take any risks. This much we know—Latimer died the same way. Unluckily there was no suspicion of foul play and, therefore, no autopsy. Even so, I think that the Police fell down very badly in not having a proper examination. Latimer died, and now Minnie's dead . . ." The buzzer sounded, the Old Man picked up the handset. " Yes, Surgeon ? Not a mark, you say ? Well, take her apart, man. Find out what it was, if you can." He replaced the instrument. He asked, half seriously, " Have we any Egyptians among the staff or passengers ? We don't want any religious minorities to interfere with *this* dissection."

It was a little after 06.30 hours when the Surgeon reported to the bridge in person.

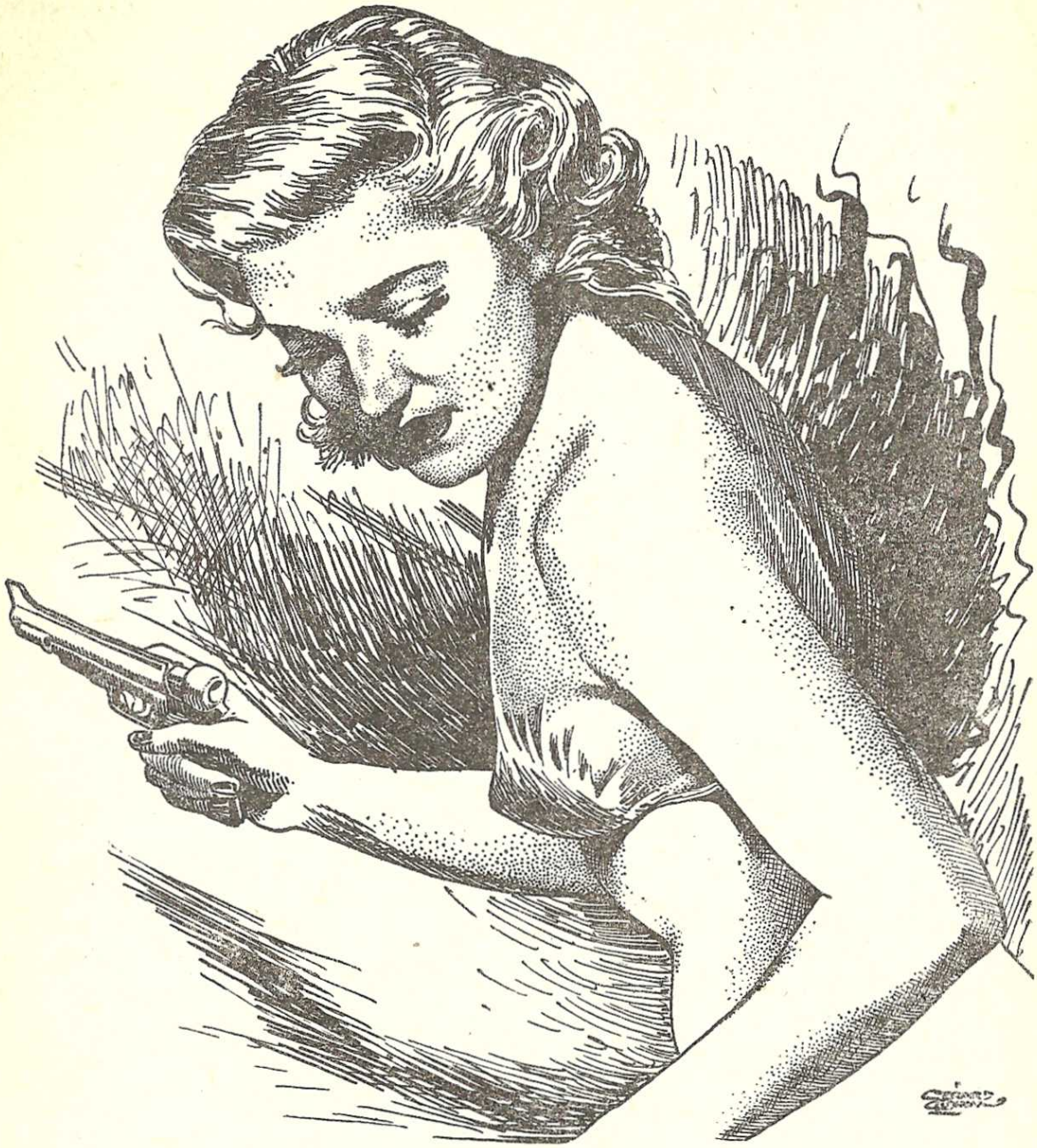
" I'm not a vet," he said, " but I think I should be able to find out how, or why, any animal died. Regarding Minnie—I can't. She just —stopped. I even shaved her. There's a tiny puncture at the base of the right ear, but no swelling or discolouration."

" Poison ? " asked the Old Man.

" It could be. It just could be. But there's the lack of symptoms. And unluckily, I haven't a fully equipped laboratory . . ."

" Come to that," I said, " she could have made this puncture herself. Scratching."

" Come to that," agreed the Surgeon, " she could."



" Have her passed out through the garbage chute," said the Old Man.

" It'd be better," said the Surgeon, " if we found room for her in the domestic freezer."

" It would not," said Captain Gale. " If it is some sort of fancy plague, her body'll carry the germs of it . . ."

The Surgeon paled.

" I dissected her," he said.

I looked at the Old Man and he looked at me. The Old Man drew deeply on his pipe, then took it out of his mouth. He said, " My apologies, Surgeon. I should have thought of that. But we don't know that it is plague. And surely, in all the years that we've been

on Mars, any local disease would have struck long before now. And it'd take a tough germ to break out of Latimer's hermetically sealed casket. Nobody's who's touched or handled the case has been ill."

"No," I said.

"Even so," said Captain Gale, "we'll consign the body to Space. I may be old fashioned—but I just don't fancy the idea of having skinned, eviscerated cat, even Minnie, stowed among such frozen meats as we have carefully conserved for the Farewell Dinner. It'd put me off my turkey. Furthermore, we have the kittens. If mother had some rare disease, the odds are that they will have caught it too, that they will succumb long before any of the human beings. So, Surgeon, as and from now, you are O.C. cats. Treat Minnie's children as you would your own. And if any of 'em kick the bucket, let me know at once."

"Don't you think, sir," I suggested, "that we should pass Latimer's body overside?"

"No. Please bear in mind, Mr. West, that the Line is being paid a considerable sum in freight for the transportation of Latimer's corpse. We—or you—accepted liability for it, and we're liable if we jettison, and then if they ask us why, we'll say, 'Oh, the cat died. Well?"

"General Average?" I muttered.

"I can just see Lloyd's paying out their share, let alone anybody else. No, Mr. West, just dismiss any wild thoughts you might have of jettison."

"I think you're right there," said the Surgeon. "After all—*morticon* gas has been proved lethal to every known type of micro-organism."

He looked a lot happier, until I muttered, "Every *known* type . . ."

"Come and see me after breakfast," said the Old Man to the medical officer. "And bring your Surgeon's Log with you."

Kennedy came up for a drink before lunch that day.

"You know," he said, "we of the Press develop our own special variety of E.S.P. There's some kind of a flap in progress—I can feel it in my bones. Where's that charming cat, by the way, and her charming kittens?"

"She was sleeping in one of the cross alleyways," I lied. "Young Rawson was making his rounds this morning. He trod on her."

"That's not lethal, surely?"

"In this case it was."

"And the kittens?"

"The Surgeon's looking after them."

"He doesn't like cats. He told me."

"Lots of people," I said, "don't like cats, but like kittens."

"I've got a hunch," said Kennedy. "Shall you and I take a stroll down to the cargo space?"

" It's neither the time nor the day for inspection." Then I realised that Kennedy was deadly serious, was badly scared about something. His hand, as he put the glass down, was quivering perceptibly, and I remembered that quivering case in its network of steel springs.

" The Time Capsules," said Kennedy suddenly. " You've heard of them ? They've found 'em in all the ruined cities, assumed that they were on the same lines as the ones *we* leave loafing around—rolls of microfilm, specimen newspapers and all the rest of it. All the ones they've managed to open so far have had nothing but dust inside—Latimer reckoned that this was because of faulty workmanship on the part of the manufacturers. There were the two halves of one of the capsules where Latimer's body was found, and I've heard that there wasn't any dust inside . . ."

" The wind blew it out," I said.

" Maybe. But I shouldn't mind betting, West, that if we go aft now, and break open the case, open the casket, we shan't find much left of Latimer."

" Rubbish."

" It's not rubbish. You've read ' *The Sleeping Cities.*' You know what Latimer reckoned the old Martians were like—something on the lines of arthropods rather than mammals, something living in a sort of symbiosis with the sand hogs . . ."

" All theories," I said. " All theories. Not an atom of proof."

" I lied to you," said Kennedy slowly, " when I said that I had a hunch. I've more than a hunch." With his left hand he tapped the little press camera that he wore always on his right wrist. " I always keep Betsy loaded and ready. You never know, do you ? And last night I thought I saw . . . something, flickering along the alleyway outside my room. I shot from the cuff." He pulled his notecase from his pocket, took from it a single, tiny print. From another pocket he pulled a magnifier. " No facilities on board for enlarging," he said. " But, look."

I looked.

There was something in the alleyway. It was blurred, and it seemed to be at least semi-transparent. Perhaps it was the semi-transparency that made it look, to my eyes, like something that should have been drifting around in the clear water of a rock pool rather than along an alleyway of an interplanetary ship. The body was indistinct, but seemed to be covered with chitinous armour. There was a bundle of feathery appendages that could have been legs, tentacles, antennae—or all three. There was a pair of stalked eyes.

" Kennedy ! You swear that this isn't a trick photograph ? "

" I swear it," he said grimly.

I believed him, and said so.

" Then what are we waiting for ? " he asked.

" We must see the Old Man, now."

" It's wasting time."

" Don't be absurd. You were long enough coming to see me after you got the photograph developed, and you were long enough coming to the point after you did see me."

" I suppose I was. I've been trying to convince myself that the camera wasn't lying. I've been trying to find other evidence—but I haven't done so yet. The only way to find out for sure is to open up that casket."

" You mean," I said bitterly, " that Jake Kennedy, our star reporter, has been trying to solve the case singlehanded while the poor, ignorant spacemen bumble around all unknowing of the dreadful fate from which the pride of the press is trying to save them."

He had the grace to blush.

" All right. Bring your photograph, and we'll go and see the Captain."

I was surprised by the Old Man's reception of Kennedy's story. But then, he was an admirer of Latimer's, must have at least half believed the man's theories. He went to his safe, took out three five millimetre automatics, each with a full clip of forty rounds. He said, briefly, " Mr. West, how often is the door to the cargo space opened ?"

" Once daily, sir, when Rawson checks the temperatures."

" And it's hooked back of course, when he's inside . . . And Number Six bin—is there any way in or out when the door is locked?"

" Yes, sir. A cranked ventilating shaft."

" H'm. Get your keys, and three torches. You and Kennedy had better take a pistol each—here. Oh, get two of your cadets along with the tools for opening a case."

I went, then, to get the keys and to organise the cadets for the working party. The Old Man and Kennedy were waiting for us, in the central well, when we got aft. We opened the door, dropped aft to the correct radial alleyway, clambered down the ladder to the most convenient web frame. I unlocked the door of Number Six bin, swung it open and hooked it back. The case was still there, hanging quietly in the acceleration springs.

" It's not quivering now," whispered Kennedy. " It's not quivering . . ."

" Unhook it," ordered Captain Gale. " Unhook it. Lift it down and out."

We unhooked it, carefully lifted it out into the narrow alleyway. It was then that we saw that the back of it, the side of it that had been hidden from view, was riddled with holes, large, ragged holes, each about two inches in diameter. The three of us stood with pistols ready while the two cadets stripped the weakened woodwork from the casket. The casket was still there—but it, too, had been damaged in

the same way as had been its wooden casing. I switched on my torch, shone the beam in through the holes. So far as I could see, the casket was empty.

The Old Man laughed, a bitter, humourless sound. "You've proved your theories, Latimer," he said. "Pity that you had to do it in my ship. Mr. West."

"Sir?"

"We'll hold an officers' conference, at once, on the bridge. On your way forward get hold of the Senior Hostess, tell her to have all the passengers, and all the staff who aren't at the conference, gathered in the saloon—and to keep the doors shut. And you, as soon as you get up to the bridge, shut all the air-tight doors."

It was while we were discussing ways and means on the bridge that the real trouble started. By closing the airtight doors we had merely succeeded in shutting up the Martians in the same section of the ship as our own people. They must have been hiding in the ventilating shafts, in any case, it was from the trunking that they dropped down into the crowded saloon. There was panic with that first attack, blind fear as the flimsy monstrosities drifted through the crowded compartment, lashing right and left with their hair-thin cilia. There was the crackling of electrical discharge, the acrid odour of ozone. There was the Chef running berserk with his carving knife, avoiding electrocution by a miracle, and the retreat of the invaders to the trunkways. All this we missed, hearing the shouting and the screaming but arriving on the scene too late to play any part in the initial skirmish. When we dropped into the saloon from the central well we found seven human dead stretched out on the deck and, a little way from them, two slashed and tattered things with crumpled, transparent armour, flimsy, broken legs and antennae, sprawled in a pool of sour smelling body fluids.

"I got them," shouted the Chef wildly, waving his long knife. "I got them. They were trying to drag her away with them." He pointed to one of the bodies. It was that of Madame Kapitza.

Suddenly the Old Man was an old man. He called the Chief Hostess from the huddled crowd, said, "Tell us what happened."

She was badly shaken, but she told us, wasting no words, omitting nothing. She stressed the seemingly electrical nature of the Martians' natural weapons, supported the Chef in his assertion that there had been an attempt to capture at least one of the victims.

"See if artificial respiration is any good," said the Captain to the Surgeon. "You, West, and you, Kennedy, keep your pistols handy, watch the ventilators." He walked to the two Martian bodies and stirred one with the toe of his shoe. "They're flimsy brutes. Mr. Twayne, come with me back to the bridge. Mr. West—you're in charge here in my absence. I'm going to cut the spin, then I'm going

to slam on five gravities acceleration, so make sure that everybody's prone when I do so."

I started to consider what orders I should have to give. First, with the spin cut, there would be weightlessness to contend with. Then, when the drive started, what had been the after bulkhead would become the deck. I should be lucky if we completed the manouevre without any broken bones. But to send passengers and personnel to their cabins, to their acceleration couches, would be out of the question.

Meanwhile, what freedom of movement had the Martians got? In our hasty scramble from the bridge to the saloon we had opened the airtight doors again. Until they were shut once more all the ventilation system was a highway to the invaders—a highway that they would not be able to use when crushed by acceleration.

I watched the Captain, followed by Twayne, mount the flimsy folding staircase that led "up" to the central well. I saw him pause at the head of it as he opened the door. I saw the shadowy form in the near darkness, and the lashing cilia, and I fired—but I was too late. For a long moment Twayne clung desperately to the handrails, but the Captain's weight had caught him off balance and, together, they fell. Twayne got to his feet uninjured. The Old Man didn't move.

"Mr. Twayne," I said, "get on the blower to the bridge. See if Welby's all right."

Twayne walked slowly to the intercom telephone, dialled, held the hand set to his ear. "There's no reply," he said.

"Do something!" screamed a woman. "You're in charge. *Do* something!"

"Has anybody got any suggestions?" I asked.

Lynn Davies came to my side. She must have come straight from the sports room when the initial alarm was given—her costume, what there was of it, left very little to the imagination. She grinned and said, "I could hand you a top hat, and you could pull a white rabbit from it."

"Thanks, Lynn," I said. "But I'm afraid that white rabbits wouldn't be much good right now."

But I was glad to have her with me, glad to find that one, at least, of the passengers was cool enough to joke about what was a very nasty predicament.

"We could parley," said Trainer.

"Parley? How?"

"They must have a language."

"And they know it," I said, "and we don't."

"Yes. You could parley," said a new voice.

All of us turned to stare in amazement at the after ventilating shaft. It was dark inside it, and we could see little but vague movement, a stirring of shadows. "You could parley," said the voice again. The

voice? It was more like the sound of the wind in trees, somehow shaping itself into syllables and words, rustling, expressionless.

"Who are you?" I asked. "What are you?"

"I am the . . . mother. The queen. As a larva I fed on the cells of the being you call Latimer. I fed on the cells of his brain—and ate his knowledge and his memories . . ."

"Impossible!" barked the Surgeon.

"I am the queen, and the others are my . . . slaves. I carry in me the seed of the race, and the long memories of the race, and the memories and the knowledge of all our hosts from the beginning. The wise ones said that we were to sleep, and that some day new, young beings would drop down from the stars and that we would start anew. We are starting anew."

"You're not," I said.

"But we are. We hold this little, flying world you call a ship. You cannot move from this cell in which we hold you captive."

"All right. What do you want?"

"We want one of the tiny ships, the . . . lifeboats, you call them. We know that your race holds our world, and is too strong to be evicted. We know that we could never conquer your world. But there are other worlds among the stars, and we shall find one."

I felt a stab of sympathy for the strange being, for its pitiful naivity, for its foolish dream of making an interstellar voyage in a lifeboat. It was plain to see that Latimer had known little of astronautics.

"How will you navigate?" asked Twayne.

"Navigate? Oh, yes. The young man who was at the controls of this ship has been . . . stopped, and now carries our seed. The mother, when she is mature, will hold all his memories and knowledge. But we must have more hosts. The ones we . . . killed in the fight are no longer fresh enough."

"How many?" I asked, hoping that by prolonging this crazy, nightmarish conversation I should learn something which would aid us in our fight against the Martians.

"Six. They must be young, and half of either sex."

"Agreed!" shouted somebody. "Take the six hosts, and go!"

I turned to see who it was that had spoken. It was an old man, someone who knew that he would not be required. I said coldly, "I'm in charge here. I haven't capitulated. I'm trying to find out what we're up against."

"You make treaties," said the voice. "You make treaties, and you honour them. Surely what I ask is not much."

"All right," I said. "We make treaties. But I'd like to see what I'm making a treaty with."

"You shall. But you are armed. Have I your word that you will not use your weapons?"

"You have," I said, after a long hesitation. "Have I yours?"

"Don't be a fool, West," cried Twayne.

"Let him play it his own way," whispered Kennedy.

"You have our word," said the voice.

Slowly, slowly, the thing lowered itself from the ventilator. It was like the beings that had already been killed, but far larger. I stared, fascinated, at the internal organs which, clearly visible through the transparent armour, swelled and pulsed. *That must be the heart*, I decided, *and* that *the brain* . . . Somebody screamed, and Lynn Davies' fingers dug painfully into my arm. The worst part of all was the exposed vocal chords of the brute, and the way in which they quivered when it spoke.

"I find you repulsive too," it said.

"Drop that!" I heard Kennedy say.

I turned to see that Kennedy had caught Twayne's arm before he could bring his pistol to bear.

"You are not to be trusted," said the Martian. Swiftly it pulled itself back inside the ventilator.

"I gave my word," I said to Twayne. "I'm in the habit of keeping it."

"You gave your word to a . . . a *prawn*!" spluttered the Second Pilot.

"Stalemate," said the Surgeon.

"It will be a long time before they have their navigator, anyhow," I remarked.

"Not long," said the Martian. "Our seed grows fast. Already my mind talks to the mind of my daughter queen. Already I am learning, from her, more and more about this flying world of yours."

"Bluff," I said, then remembered how Latimer's body had been preserved. It may well have been that the *morticon* gas had slowed down the growth of the seed. Anyhow, there was one comforting thought. The Martians seemed to have telepathy, but only among themselves.

"I grow impatient," said the Martian. "I shall be in the adjoining cell. Send in your six hosts one by one, that I may plant the seed in their bodies."

"And if we refuse?"

"I told you, I talk with my daughter queen. I learn how the flying world is built. I know that I can shut all doors to your cell, and let the air blow out into the emptiness outside. One by one, I say, to the number of six, three male and three female, and with no weapons. Should any try to attack me—then the order goes to my slaves to open the . . . valves. And I do not wish to be kept waiting."

Abruptly, a clanging sound came from the orifice of the ventilator. I saw that the airtight seal had slid into place. It was obvious that the Martian had not been bluffing.

" Are you calling for volunteers ? " asked Twayne. " Or casting lots ? "

There was a painful singing in my ears. I swallowed, and it ceased. " A reminder," I said, and even to myself my voice sounded thin and faint. When the airtight door into the Sports Room slid open the sudden restoration of normal pressure made me giddy.

" Someone has to be first," said Lynn Davies. She looked down at herself with a rueful smile. " At least, they'll never think that I'm armed. I couldn't hide a penknife in this rig ! "

Her face pale, but with head held high, she walked to the partly open door.

" Lynn ! " I cried, putting out a futile hand to stop her.

" Let her go," snarled Twayne.

I shook him off, started after the girl. I felt in the waistband of my shorts for the pistol, but it was gone. It didn't matter. Fists and feet would be more satisfying.

In the doorway stood two of the smaller Martians, cilia waving. I'd have blundered in to them, been electrocuted, if Kennedy hadn't caught me. " You can't do anything ! " he shouted. *You* can't do anything ! "

Something in the tone of his voice calmed me down. He knew something, I could tell. But what ?

Together we watched the girl walk slowly to the monstrosity that squatted—and the incongruity almost sent me into a fit of hysterical laughter—on the tennis table. We watched the waving antennae, the slow unsheathing of what must be the oviposter. Kennedy's gun was out and ready—and then the door shut.

" She'll make out," said Kennedy.

" What do you mean ? "

In answer, muffled by the metal of the door, there came the sound of five rounds rapid fire. Then, after a pause, three single shots. Then silence.

When the telephone buzzed I ran to it, snatched the instrument out of its rest.

" Lynn here," said the voice. " All the doors are shut. How do I get out of here ? "

We got her out, eventually, and got ourselves out of the saloon. We had to force our way into the ventilating system, doing irreparable damage to the sealing plates, and work our way to the bridge. We found several of the smaller Martians, but they were all dead. We found, too, Welby's body—and it was not a pleasant sight, stirring and . . . rippling as it was with alien life. I had it carried at once to the nearest airlock and jettisoned without ceremony.

When it was all over, when the ship had settled down once more to an approximation of normal routine, I sat with Lynn and Kennedy,

trying to piece together an account of what had happened for the Official Log.

" And now, Lynn," I said, " let's have your side of it."

" Well," she said, " it seemed to me to be fairly obvious that the queen was running the whole show by telepathic control. I thought that once she was dead the workers—or the slaves, as she called them—would be pretty helpless. It so happens that they were even more helpless than I thought, too helpless to go on living. Anyhow, I had to kill the queen."

" But *how* ? "

" With your automatic, of course."

" But you were unarmed. I'd swear to that."

" I told you once," she said, " that I was hoping to start my own magic show. How could I hope to pull the wool over the eyes of an intelligent, human audience if I couldn't fool just one, stupid cross between a prawn and a queen bee ? "

A. Bertram Chandler

The Literary Line-Up

Every once in a while a story reaches us which seems to make an editor's life worth all the blood, sweat and tears expended in producing this magazine. It doesn't happen often, but when it does we throw caution to the winds and bluntly state we have a smash-hit.

Coming up in the June issue is just such a story—" The Conspirators " by James White is going to rank with such well-known animal stories as Jack Chandler's " The Rat Race " and Will Temple's " The Smile Of The Sphinx." We will go one more than that and state that it is *better* than both of them ! The ingredients are: a cat, a canary, some mice and guinea pigs, and mutation on an interplanetary voyage. Having seen two further stories by Mr. White we can safely prophesy quite a literary future for him . . .

There will be new short stories by John Christopher, Lester del Rey, Dan Morgan, and Kenneth Bulmer, plus the terrific ending of Cyril Kornbluth's serial " Takeoff."

Your statistical opinion on issue No. 21 was:

1.	Crossfire	James White.
2.	Pistol Point	E. C. Tubb.
3.	The Hard Way	Alan Barclay.
	Power Factor	Francis G. Rayer.
4.	Ride The Twilight Rail	E. R. James.
5.	The Human Element	Lan Wright.

Lotteries have always been well supported, even though the number of winners is small. It is doubtful, however, whether a national lottery, compulsory to every male in the country, would find favour—especially if the prize was a one-way trip to Venus.

THE GAMBLE

By Jonathan F. Burke

Illustrated by HUNTER

On that day all the telecasts in the country carried one programme. Private communication ceased. The ether was cleared of gossip and everyday transactions. Every screen in the country glowed with the picture of the great lottery board.

Nanda said: "There's something barbarous about it—something primitive, like a wicked savage religion. There ought to be a better way of arranging things than this."

Her father shook his head.

"We have tried so many other ways," he said, "and you know what dissatisfaction there was then."

"Yes, but . . ."

She could not find the words to express her horror; and in any case she knew that it was no good arguing with him. He had all the answers ready. She knew how reasonably he could explain it all, and by the time he had finished she would be agreeing with him, because what he said invariably sounded so right and reasonable. But she sat here possessed by a terrible apprehension. She was scared. She looked longingly at Clint Wareham, who smiled reassuringly back at her.

Her father saw the glance and the smile, and felt a surge of anger. Or would jealousy have been a better word? He got up and crossed the room, thumbing a button on the wall and filling his glass again with Uranian sherry. It was best that his daughter should not see his expression: she was far too acute, too ready to sense what he had in his mind.

Chief Controller Mason was not essentially a cruel man. He had a tidy mind. His efficiency and neatness made him an ideal executive, and he had reached his high position in the State because of that unswerving devotion to what was right, reliable and proper. He liked working according to a system. He liked to see things working to plan. If anyone called him ruthless—and there were many who did—he would reply in all sincerity that he conceived it as his duty to avoid disorder, which inevitably led to unhappiness and social disruption. The plan was more important than the details: the statistically verifiable good of the majority was more important than individual happiness: and when you had made a plan, it was better to carry it right through than to chop and change, to make minor adjustments that could throw the whole thing out.

Only this time his plan was a personal one. This time he had arranged things for his own satisfaction. But it made no difference to his general viewpoint. He had ensured that all would go smoothly. There would be no open unpleasantness, and he would not be saddled with the blame for breaking off relations between young Wareham and Nanda. There was nothing like doing things tidily, avoiding emotional conflicts and upsetting scenes . . .

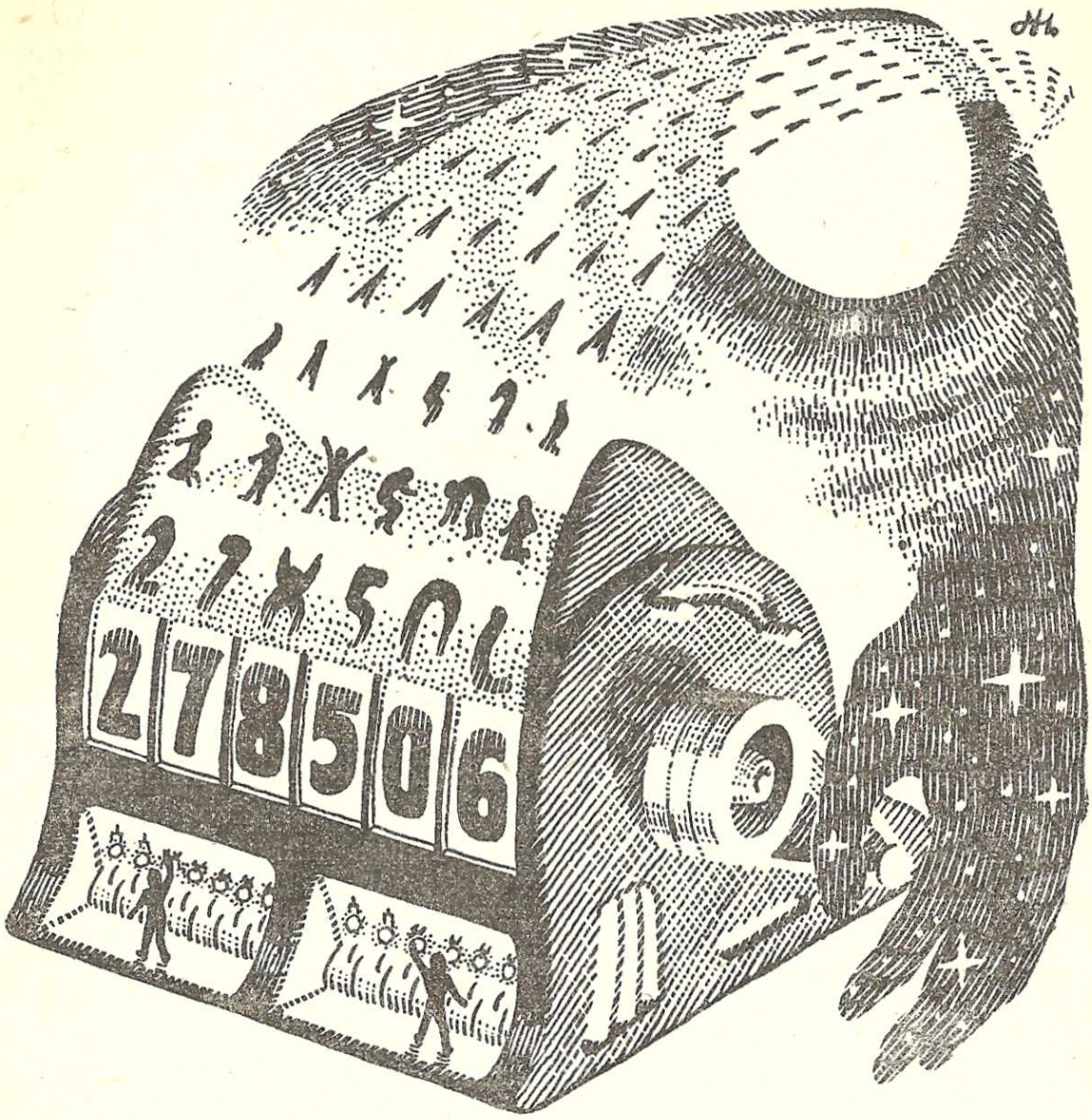
Coming back to his chair, he studied Wareham's clean, eager profile. It was not that he disliked the boy himself. Wareham was a hard-working, intelligent young technician who had already done a lot of useful work—and would now, thought Mason wryly, have the opportunity of doing even more useful work. But he was not good enough for Nanda. A young technician in Tech Grade 5, Social Rating A2, was not a suitable husband for the daughter of the Chief Controller. It was not snobbery: it was commonsense. Mason had other plans for Nanda. He was sure that in good time she would approve of them. But he knew that to show himself as a domineering parent now would be to make her stubbornly even fonder of Wareham than she was already.

The voice of the announcer came across to them suddenly, and the checkers moved across the screen towards the great board.

Softly and persuasively the voice explained what was to happen. Everybody knew the story, but this was a formality that could not be discarded. It was as though everyone in the country was settling down to play a well-known game which some busybody insisted on describing in the fullest detail.

And Nanda, Mason saw, knitted her brows in distrust and protest. He loved his daughter, and felt a momentary twinge of revulsion at the thought of the pain that he was to cause her. But she would not know that he had been responsible, and it was the only thing to do.

" The fairness of this lottery will be apparent to all," said the disembodied voice of the announcer. " There is no favouritism here. From the highest to the lowest, everyone stands an equal chance."



Nanda's lip curled. Her father leaned across, turning down the volume. Perhaps he should have said nothing, but he could not restrain himself from justifying the working of his own department. He said:

" It's true you know. It's silly of you to look so sceptical."

She turned her cool blue eyes towards him. " They say that *you* can arrange things."

" That's not true. The District Controllers have their names in as well as other citizens——"

" But they don't often come up," said Nanda derisively.

" That's only because of the law of averages. And besides, there was the case of Finance Controller Anderson nine years ago——"

" It was said," she went on in her cool, affectionate, yet somehow remorseless voice, " that you and your fellows on the State Council were not fond of Anderson."

Mason felt himself flushing with anger. He was furious that his system should have these slurs cast upon it. There had been no proof that Anderson had been cheated, and it was monstrous that such accusations should be made without proof. Even though they were true.

To prevent himself from arguing further—he did not wish to awaken her suspicions by protesting too much—he turned up the volume again.

". . . and the work that is waiting for these chosen pioneers on Venus is work that needs doing. There is no shame in being picked for this task. In years to come the planet will have been cultivated and brought under control. There will be regular services to and from Earth, and the initial period of hardship will have proved its worth."

The voice went on. It told the story of the colonization of Venus from its earliest days. It told of the expeditions that had gone out and not returned, then of the first successful landing and the jubilant return. More ships had gone out to the fertile, lush, foetid planet, and so great were the potentialities that plans for large-scale emigration and development were at once put in hand.

Then came the plague.

Earthmen on Venus had been able to adjust themselves to conditions there as they adjusted themselves to life in the damp tropical jungles on Earth. There were problems and there was sickness, but it could all be coped with. It was only when they came back to Earth that trouble started. The Green Plague, as it came to be known, was of no consequence on Venus, but on Earth it became a deadly scourge. What produced no more than a slight fever of three days' duration and an irritating rash on Venus changed its character in Earth's atmosphere and produced a ravaging disease that turned flesh a hideous gangrenous colour and caused death within a matter of hours. Helicars and monovans removed contorted bodies as swiftly and brutally as carts had in other centuries collected the victims of the Black Death. Research was of no avail. It took nearly a year for the plague to die down, in which time an appalling toll of life had been taken.

One measure was inevitable. No-one who went to Venus must ever return to Earth. Research would go on. Scientists on Earth and on Venus would work away at the problem in the hope that one day two-way communication between the planets would be possible. Until then, any man or woman who crossed space to that rich but dangerous planet was automatically an exile. There was no return.

" It is a sign of human gallantry and our belief in the importance of exploration and scientific progress," said the announcer blandly, " that even under such conditions there were still men willing to shut themselves off for ever from their home planet. They were few now, but they existed. It is this spirit which will strengthen those who are chosen at this ceremony today . . ."

There had indeed still been pioneers. Some of them had been foolhardy men who jetted off into space on impulse. Others had been adventurers who found the systematized life on Earth too dull, and wanted to search for primitive excitement and to pit themselves against a raw, untamed world. One or two were scientists who sacrificed their comfortable positions here in order to go and study conditions on Venus itself in the hope that they would one day isolate the virus that had wreaked such havoc, and thus restore normal communication between the planets.

The scientists and explorers made regular reports to Earth. A space ship was sent back at intervals, coming within radio range of Earth and passing over technical messages and messages to relatives from those who would probably never see their families or friends again.

After a few years the reports from Venus became extremely tantalising. The mineral wealth of the planet was incalculable. The men of Earth, still suffering from the spoilation of their planet by careless and greedy profiteers in earlier centuries, looked longingly up at the distant sparkle in the sky that represented a rich, fruitful, still unexploited source of so many things that were desperately needed here. The thing to do was to make sure that the planet was opened up ready for use when the time came for two-way traffic once more. People must be encouraged to go to Venus and work there, building roads, digging wells, constructing mines and laying the foundations of refineries, factories and warehouses. There would come a time when all these things would be needed. Hard work now would save time and trouble later. Men must be encouraged to make the sacrifice, to exile themselves voluntarily from their homes in order to ensure the future prosperity of their own people and their descendants.

And if they would not be encouraged . . . if they would not go voluntarily . . . ?

" The convict labourer was not an ideal solution," the announcer said, reaching his summing-up as the lights on the lottery panel began to flicker into life. " Quite apart from the ethical problems raised by eminent penologists, it was found that riot and disorder spread over Venus, and there was a danger that the convicts who had been banished there would become strong enough to take over the planet for themselves. Forced labour was of no use.

" Many other systems were tried—a ' points ' system designed to utilise the services of those with few social responsibilities, no families, and so on—but there was great dissatisfaction over this. No system proved feasible. In the end the present method was introduced, and is agreed to be the fairest of all. In such a lottery there is no discrimination. Every able-bodied man stands an equal chance. Venus needs good technicians, and it needs good labourers. There is a job

there for everybody. If it falls to any one of you to go, there will be some fine and necessary task awaiting you. I have been asked to give the following message from the State Control Council to all of you: ' The venture on which you set out is a worthy one. It will bring happiness and security to generations of Earthmen yet unborn. It is a noble banishment, undertaken by free citizens of our free world. When the day comes that disease is eradicated and Venus becomes as one with Earth, the names of the pioneers who made the future possible will be revered by all those who come after. The esteem and good wishes of all on Earth go with you.' "

The voice ceased. On the screen the lights glowed more powerfully

Mason moved restlessly in his chair. He wanted it to be over. He felt a great irritation. He wanted somehow to walk into the screen, to switch on the machine and then to watch the checking of the census returns as the chosen numbers were referred to and the actual names produced. To do something—anything—rather than sit here waiting.

Nanda said: " I'm frightened."

" Whatever for ? " said her father. " We haven't got round to choosing women yet. We rely on there being enough who will volunteer to go with their husbands."

" And they usually go ? " asked Wareham.

" They usually go," Mason nodded.

The announcer's voice solemnly warned everybody to pay attention. The panel was ablaze with light. It was like some grotesque sideshow at an old-world fun-fair. Millions of eyes were watching telescreens at this moment. They watched as the indicator blurred, flickering with a jumble of unrelated numbers. They watched as the two mechanics threw switches, so that a new note entered the shrill electric song of the machine.

Inside, behind that panel which was to show a hundred men their destiny, the wheels ran abruptly free. The flashing disjointed numbers on the screen slowed.

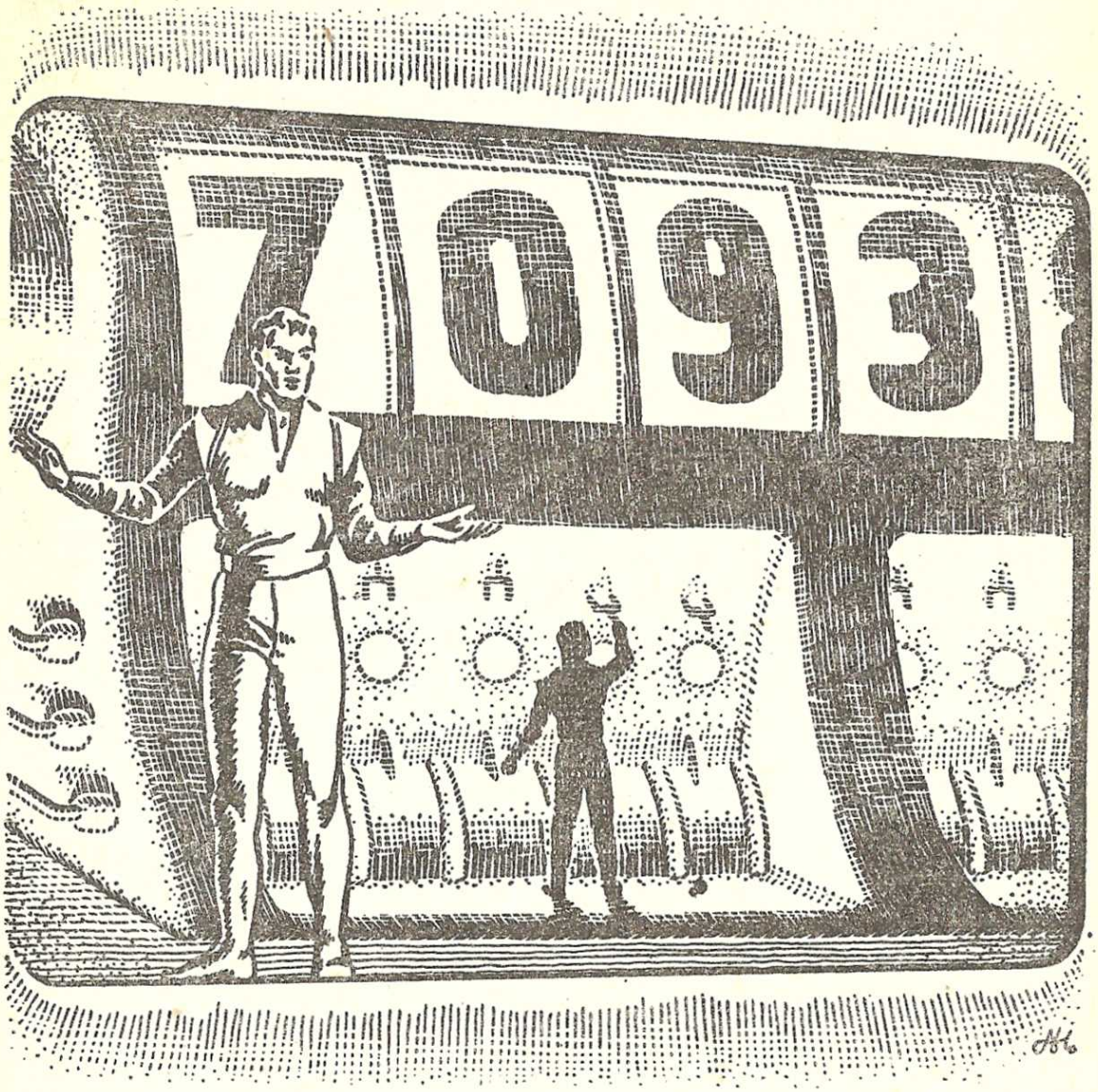
Somewhere perhaps a viewer fainted with the strain. The country was bound by a tension that was almost like a physical constraint, some strange force in the air itself.

The first number shone on the screen.

The checkers produced the census records, and the automatic selectors flicked over the pages expertly.

The first name was announced.

A man of thirty-five, six hundred miles from where the lottery was taking place, must now be trying to believe that it was true. He and his family must still be trying to pretend that they had not seen and heard aright; and at the same time they must half-consciously be making plans, adjusting themselves to the awareness of what was in store for them—an arduous life on a new world, deprived of all the things they had taken for granted on this world.



Another name.

Mason held himself still in his chair. It would, he had been assured, be the fifteenth selection. That was the one he was waiting for. He prepared himself for the shock of it: it would be a shock as it struck Nanda, and he must be ready for her, ready to reassure her and comfort her and to express regrets to young Wareham.

Another name, then two more quickly.

And another.

" It's barbarous ! " cried Nanda suddenly. " If it has to be done this way, it ought to be done in secret—not in this melodramatic way, like a public execution."

" And who would then believe the results ? " said her father quietly. " Nor is it correct to compare it with an execution. This is a necessary thing—a noble thing, if only people can be persuaded to see it that way."

He spoke crisply, cutting his words short, keeping count of the names. And at last it came.

" Wareham. Clint Wareham. Tech Grade 5, Social Rating A2. Block 82, Main Street, Persepolis. Clint Wareham."

There was silence. Mason reached forward and flicked the switch, so that the picture died and they were left on their own, the white-faced young man motionless, and the father and daughter staring at one another.

At last Nanda said: " No. It can't be. I won't believe it."

" I'm sorry, Wareham," said Mason in his most quiet, sympathetic tone. " It's hard lines. But I can see you're the sort of young man who will make the best of things."

" We all stood the same chance," said Wareham numbly. " It just happened to be my number that came up. I've just got to face it."

" That's the spirit," said Mason.

He averted his gaze from his daughter's face. Her blue eyes brimmed with tears that she would not give way to. Her stubborn chin seemed to accuse him.

She said: " If Clint goes, I go with him."

" That's out of the question, of course," said her father.

" Men can take their families. A man can take his wife. The authorities approve of that."

" But I'm afraid I can't consent to your marrying our young friend," said Mason levelly. " I have the greatest respect for him, but I think I've made it clear to you both that I would not give my consent to your marriage."

Nanda said: " There's no question of your consent. We're already married."

Mason sprang up. He stared from Wareham to his daughter and back again.

" You're joking," he snapped. But their expressions told him that this was no joke.

Wareham stood up as well, and faced him. He said:

" We were going to tell you this evening, sir. Sorry it had to come out like this."

" But you can't be married ! I haven't given my consent, and you couldn't have done it without my signature as Controller. Besides, the Eugenics Registry would never have passed you without the usual formalities and the signatures of——"

" Your name works wonders," said his daughter softly, " in falsifying records and obtaining certificates—I've discovered that. And as for your signature . . . who knows better than I do where you keep your personal seal ? "

He knew she was telling the truth. The two of them were married—and she was legally entitled to go with her husband to Venus. They

would never come back. He would never see his daughter again: and at this moment he knew more than ever before just how much she meant to him, how impossible it would be to lose her. He had tried to keep her to himself by disposing of Wareham; and now he was to lose her altogether.

Furious, he shouted: " I'll have the Registry screened by my own police. I'll have the whole place combed out so that there's never another possibility of forgery and trickery. I'll find the man who passed this certificate through, and I'll have him atomized, whoever he is."

" You can do that," said Nanda. " It's in your power to do it. But you can't unmarry us. The law can't be stretched that far. Even you can't reverse things like that. And so I shall go with Clint to Venus."

He slumped back into his chair. Clint put an arm around Nanda—around his wife—and together they looked down at the powerful man who had been so severely stricken.

Nanda's features softened. The affection that her father felt for her was answered in her face. She said, half as a mocking challenge yet half in real need, real love: " You could come with us. Think what your presence on Venus would mean ! You could give up the follies of this monotonous dictatorship here and get to grips with something real ! "

" Give up my position here, to grub about in swamps and jungles?"

Mason clenched his fists suddenly and stood up again. Something had to be done. With all the resources at his disposal, it should be possible to turn back the clock. His daughter was not going to be sent to Venus. Whatever happened, he was not going to lose her.

The declaration went out swiftly and violently. It had come to the notice of the Controller's secret police that the lottery had been fraudulent. The machinery of the great, supposedly infallible and impartial panel had been tampered with. Some operative with a personal grudge against one of those chosen—it was not stated which one—had contrived to juggle with the controls so that the result was arranged in advance.

The responsibility was pinned to one man. The newscasts a few hours later announced that he had been " rayed down while resisting arrest."

Nanda said bitterly: " You'd have a man murdered just in order to get your own way ? Making out that the result was fraudulent and killing an innocent man——"

" He was not innocent," snapped her father with complete sincerity. " The results had been rigged, and that man was responsible."

He did not say that the man had been employed by himself to prearrange the result, nor did he admit that the liquidation had been a summary one, designed to stop him talking.

His first aim had been achieved. There would be a new lottery. The sooner the better—get it over with, in case there was any protest.

But who would protest ?

He was aware of mutterings in the ranks of his own men. The clerks in his own Records Office glanced at him with resentment when he stalked through. He could not point to any open insubordination, and nobody said anything derogatory, but he sensed a spirit of revolt. Some of them must have known that the dead man was one of his employees. Some of them may have been putting two and two together, unable to make a definitive four but getting uncomfortable close to it.

But he had had troubles before. There had been times of tension, and this would not be the first crisis through which he had come safely. The lottery over, those who remained behind would draw sighs of relief, and more mundane problems would soon arise to occupy their minds.

He himself could then turn his mind to the question of his daughter's marriage. Young Wareham was staying here for the time being, but that could not go on. There must be some arrangement . . . some way of annulling the whole affair . . . some way of winning his daughter back and eliminating the young man.

Mason did not specify what sort of elimination he meant. There must be nothing drastic, nothing brutal.

They sat once more in front of the screen, this time more at ease. It was highly improbable that Wareham's name would turn up again. The odds against it were too high to make the possibility one of any serious concern to them. They watched today merely because it was the inevitable habit all over the country. Everybody watched.

The announcer went briskly through his preamble, treating it with very little respect, knowing that all his listeners had heard it so very recently. He explained the reason for the repetition of the lottery, respectfully mentioning Mason's name and commenting on the efficiency of the special police who had so speedily tracked down the meddler.

" And so we come once more to the great gamble," he said at last. " This time the results are in the lap of chance. Every precaution has been taken to ensure that no tampering with the panel is possible. From the highest to the lowest, each able-bodied male citizen stands an equal chance."

The panel glowed, the numbers jostled and whirred, and settled at last into place.

A name ; another name ; and another.

" Do we have to watch all this again ? " said Nanda.

Her father shrugged and leaned forward to switch off. Then he said, hardly knowing why he did so: "We may as well follow it right through"

And the fifteenth name was that of Chief Controller Mason.

They were all three stunned into incredulity. Clint Wareham let out his breath in a long sigh and went on staring at the screen as though expecting a refutation.

Mason sat quite still.

He felt warmth draining out of him. He was cold with fury and fear—a fury that drove him in a minute to stand up and stride away to his personal telescreen. His lieutenants must be summoned at once. He did not believe in a chance of this sort. This was no fluke. Immediate action was essential.

There was no response from the screen. When he tried to thumb open the contact line, he was connected at once with the lottery. Yet this was his private line.

He stormed downstairs, and was crossing the hall when the doors opened and a squad of his own men came in.

" You've come at the right time," he said tersely. " Lieutenant Bridges, I want you to——"

" Our orders, sir," said the lieutenant, " are to guard the house and give you whatever help you need in preparing for the journey to Venus."

He stared. " Orders ? Don't rave at me, man. I'm telling you—"

" Certain high officials of the State," said the lieutenant impassively, " fear that you may attempt to overturn the results of the lottery once more. It is their wish that you shall be guarded, treated with every consideration, and encouraged to make the sacrifice that you yourself have so often commended in speeches and telecasts. It will be a noble example to the people of this country and of the world."

" Noble example, you young whippersnapper ! Haven't you any loyalty—you, my own men ? "

The lieutenant, still standing to attention, said quietly: " Loyalty, sir ? Such an emotion comes with difficulty after a man acting under orders from you has been murdered by your orders."

They stared at one another. Mason could not move. He was trying to see it all clearly, to see without becoming hazed by anger. It was clear that he had been cheated: his enemies had caught up with him and taken the opportunity of upsetting his power. They had even succeeded in turning his own guards against him.

He said: " This is a farce. The lottery has been rigged."

" It is doubtful, sir, whether you can make such a claim a second time. The fact that you yourself happen to have been one of those chosen will make your story even more unconvincing."

" You think I can be thrown out as easily as this ? I don't know what blackguard you're working for now, Bridges, but you can go back and tell him——"

" My orders are also to tell you," said the lieutenant, " that in the event of your attempting to evade the consequences of the lottery,

your daughter will be informed of the whole story of your plan to get rid of the man who is her husband, together with details of your murder of the unfortunate, loyal technician who carried out your plans."

Mason hesitated for a moment, then nodded briefly, turned, and went back upstairs.

Nanda was waiting for him, coming to meet him with her arms out to him.

"It can be an adventure!" she said. "Really, it can. Father, I don't think you realise . . ."

"Don't you start feeding me with propaganda," he said with a wry smile. "Don't forget I sponsored most of it—I even thought up some of the most compelling phrases!"

But he spoke without bitterness. His fear and fury had both drained away and he felt strangely calm. He sat down, possessed by a strange peace that be could neither explain nor resist. It was as though some part of him—some sense of abstract justice whose existence he had never admitted before—was pleased and assuaged by this stroke of fortune. Reality had caught up with him. He found that he could meet it with a fatalistic stoicism.

"It may be very interesting," he said after a while. "At least one can get to grips with things. This sort of insulated, highly civilized life isn't good for the human race: or for individual members of the human race, if it comes to that."

"And we shall be coming with you," said Clint Wareham.

"You . . . ? That's absurd."

"We don't see why we shouldn't share the adventure," said Nanda eagerly. "Your propaganda has done the trick, you see: we believe it's a job worth doing, and we're tired of this world where every job, every minute of human existence, is dovetailed into a plan that makes life nothing more than an unimaginative routine."

"I won't let you come. It's out of the question."

"Volunteers for Venus are still welcome," said Wareham.

"And you'll need some help when you get there," said Nanda. "It won't be easy." Her voice softened. She put her hand on his arm. "Don't be stubborn. This is going to be a new life, and it will be one worth living. But you'll need us."

He looked from the young man's clear, confident face to his daughter's. And slowly he nodded and said:

"Yes. I need you. I need you very much."

Then they began to discuss plans and to prepare for the great adventure.

Jonathan F. Burke.

It is difficult to believe that Man is the only intelligent being in the galaxy, although he may be the only type in our own Solar System. Distances are so great, however, it may take pure chance to establish contact with other entities.

SPACE CAPSULE

By E. R. James

Illustrated by SMITH

Bump——

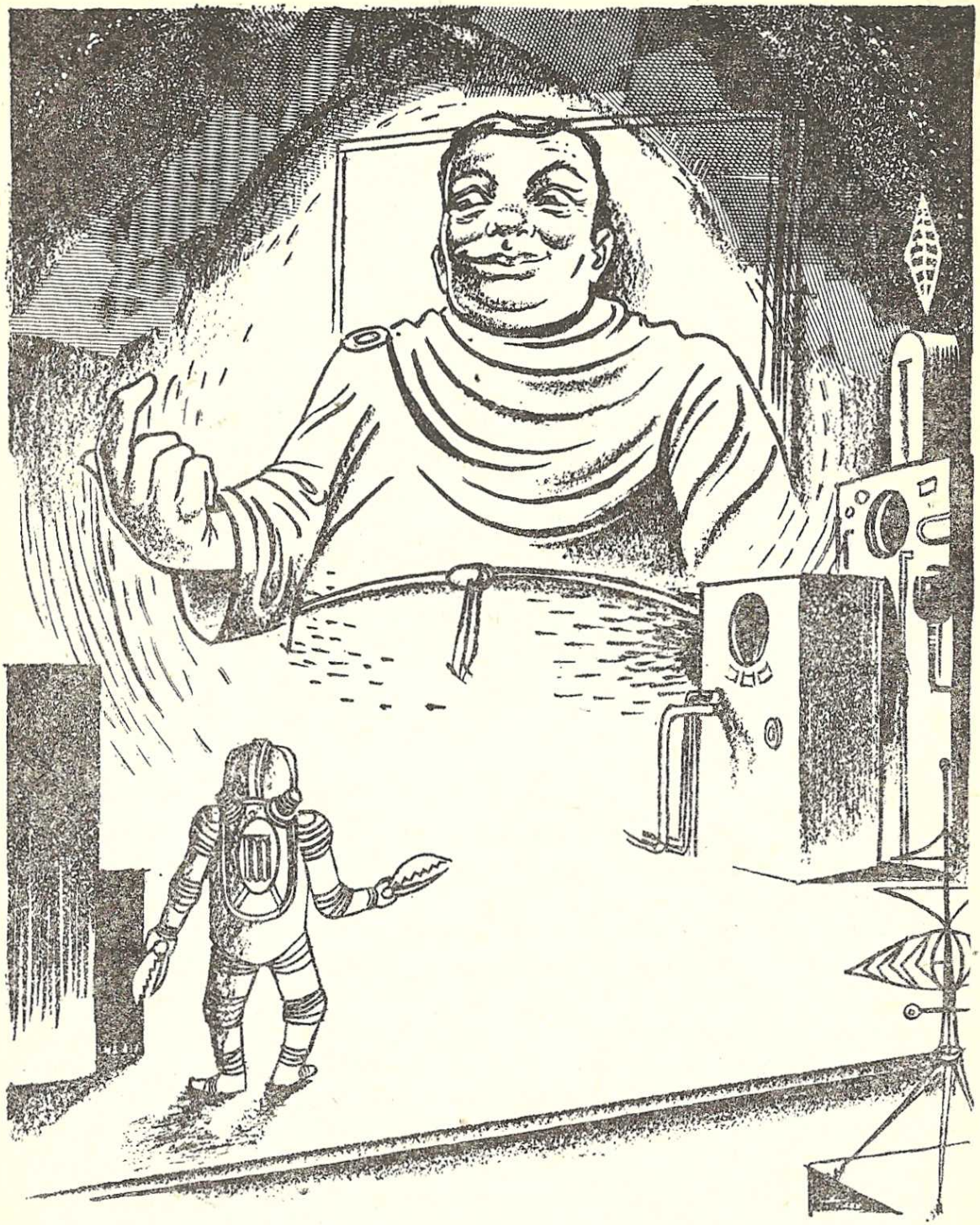
Georg Landers took his head off the padding of the adjustable acceleration couch.

The spacedrifter was still shuddering and he clutched instinctively at the grips on either side of him. As he had no rocket tubes of his own, a jolt like that could only mean that something of a high mass had rammed him from the rear.

The grips vibrated into his awareness, and he sat up. The couch, made to fit him, bent at its joints and evinced no tendency to flatten out as it would have done if there had been any remaining change in speed.

He struck away his sleeping straps, thrust himself up, arm-high, put one foot on the left grip and kicked off. Diving from the couch in the centre of the spherical caretaker quarters towards the port observation periscope, he was uncomfortably aware that a second jolt, if it came just then, would have the effect of throwing the aft wall with all its curving miscellany of equipment and instruments forward to hit him.

His fingers hooked over the grips beside the periscope window and he drew himself down, muscles straining, mind impatient. Air seemed to have almost the consistency of water when one was clear of a gravity field and circling the Sun at orbital speed without power.



One leg hooked over the bar provided, he swung the periscope around. At first he thought there was nothing to see; then he realised that he could not see the stars immediately behind the drifter. His breath caught in his throat. Something big was stuck into the huge cargo globe that was fastened to his little globe with a network of girders.

What could it be ? He thought of hijackers, but dismissed that as fantastic; the " drifters " carried only those cargoes not worth the

while of the cargo lines and they circled the Sun in special allotted channels so that collision with a powered spaceship was most unlikely—unless it was a hulk.

A hulk would mean salvage monies. He kicked off towards the radio equipment with rising excitement. Being a drifter caretaker was one way of seeing the planets, but it was no picnic.

" Hello, Drifterport, Deimos, Mars," he called back to the tugboat station on the Martian satellite.

They listened to his report but did not sound very enthusiastic or excited; merely irritated. " Leave your radio switched on to send," they told him. " Call us again after you have investigated."

He dived from the radio to the spacesuit locker. Shut in the cumbersome " suit "—it was more like a cylinder with arms and legs than a suit—he laboriously climbed around the globe to the airlock exit on the other side.

Being outside was always rather alarming. The illusion of standing on the edge of a precipice was breathtaking. He hooked his safety line to a ring provided for that purpose and clumped aft out on to the girder framework. Like being a heavenly steeplejack . . .

The cargo sphere loomed up before him like a miniature world. He clumped up over its swelling surface . . . and began to wonder what awaited his sight.

Caution in the hampering suit was out of the question. One walked stiffly upright in a utility job like this.

The stars weren't shining ahead. The sheet metal beneath his feet was crumpled up.

Crack ! He had walked into something. For a moment he feared he would drift away from the cargo sphere. In a slightly dazed way he tried to rub his bruised forehead; his feet searched fumblingly for the sphere's surface; he withdrew his right arm from the stiff sleeve and forgot his bruises as he switched on his headlamp.

The magnets in his boots were drawing him down to the sphere. Directly ahead of him a wall of pockmarked grey metal seemed to move slowly upwards. His feet touched down with a jolt. He swayed as his left arm, still in the suit sleeve, rose in a reflex action to prevent him catching the glass of his helmet another crack.

The pincer fingers stuck into the metal before him, only slightly, true, but it was enough to hint that it was lead, or an alloy of similar softness.

He leaned backwards balancing carefully, and at length got a boot on the dull grey surface at right angles to the surface of the sphere. He strained himself so that he stood upright on that pocked surface. There were little glints all over it, he saw, now that his eyes were becoming accustomed to the gloom of the shadowed side of the sphere behind him and the mystery ship—star reflections.

He found he could walk. The magnets in his boots could hold the grey metal below his feet. So it wasn't lead—not pure lead anyway, even if it was bright where it had been scratched—

Even so, he had to halt suddenly to avoid tripping over the circular, raised-up—was it a hatch cover ? He got his feet well apart, used a long tool from his belt to increase the reach of his pincer fingers, and heaved on the bars that seemed to have been provided to raise the hatch.

It came up easily and yet with a certain resiliance as though counterpoised to close slowly, perhaps by its own " weight " and the attraction of the main body of the ship—but that would mean the ship was of great mass—and ships were made for lightness and strength—pounds in weight took tons of fuel.

The light of Georg's helmet found the inside of the ship—or was it a ship ? There was a definite layout to the furniture that showed in the moving circle of light. There was a feeling of up and down not at all like that of the ships Georg knew. Some of those had concentric " floors " so that there was a feeling of gravity provided for passengers by the spin of the ship; others had a nominal floor appearance in the opposite direction to that of the rocket thrust.

This ship—if it was a ship—had a flooring as flat as any aircraft or ship on Earth.

And the furniture looked wrong, too. It was like a — a caricature of real furniture, almost like something out of a surrealist picture. Georg pushed himself upright and watched while the hatch swung down with a kind of ponderous slowness.

He made his way back to his cabin. With the helmet off he paused, looking around. Somehow the caretaker quarters had never looked so much like home.

He made his way around to the radio. " Hello, Drifterport, Deimos, Mars."

" Where've you been ? " they asked him impatiently.

He grimaced to himself at the minds of those who do the paper work. And yet, perhaps it would seem long to them. He told them.

They came back: " How big is this ship with which you've collided?"

" Hard to say," he replied. " More than a hundred feet long, perhaps a hundred yards, or more."

" Didn't you find out, then ? "

"No. Confound it. You can't have it all ways. I came back to report; you grumble at me first for being late, then for not taking long enough."

The sweat brought on by his efforts was beginning to be uncomfortable. He listened without comment to an admission by authority that he had been sent off at a slightly wrong angle and was thus in a part of space where he had no right to be. Fresh calculations were being made and he would be either followed from Deimos or met from Lunaport, Earth, whichever was found to be the most practicable.

" Meanwhile," he said, " what should I do ? "

" You'll have to use your discretion," they told him loftily.

As he stripped off, towelled himself vigorously and changed his thick spacesuit underwear he grimaced at the radio and the empty cylinder of the suit. " Blah ! Blah ! " he said very seriously. " Oh, very helpful. Nobody wants to send a ship after me. It would cost so much that they'd simply have to get authority from Earth. ' Just let him drift on; calculating his new orbit won't cost more than a few coppers in power . . . .' Oh, blah ! blah ! "

He climbed back into the suit, switched the radio set to send, remembered to eat some chocolate and drink some water, and then retraced his steps all the way to that hatchway.

At least it looked the same hatchway. If it had seemed further this time, perhaps that was only his imagination. More than once he had an uncomfortable impression that he was being watched. To look round, meant turning around. Stiff, ungainly—it took time. He only did it once. In the darkness, watched by those glaring stars, one only felt a fool for the effort.

As before he found it lifted easily, but this time there was no glassy surface below it; instead just—blackness.

He stared down. With only pincer ends to the suit arms and with knee joints so stiff as to be almost useless, getting into a hole like that wouldn't be easy; getting out would be the very devil !

Alone as he was, he did not feel like attempting it and he let the hatch swing shut before he moved off with stiff, determined strides to make some estimate of the curving metal surface. From the end stuck into the cargo sphere to the rounded end distant from the ship was 398 paces—something like a hundred yards. Its general shape was cylindrical. 193 paces covered the arc of the shadow side, suggesting an interior cross section of about 100 feet.

In the course of his perambulations he relocated the two hatches, but found no other features whatsoever. He went back to his radio and reported his discoveries.

" Excellent work," they told him. " You've done all you can. We're sorry we cannot send after you, but you're already five days out and travelling at the peak drift velocity allowed us. It isn't long before tugs from Lunaport will be meeting you."

" You want me to sit tight, here," he said broodily and with a slow glance around the silent caretaker quarters. " Just sit tight for three weeks, while I fall Earthwards on my unpremeditated course with something like a giant bomb stuck in my tail . . . Huh ! "

" Bomb——" began the impersonal voice on a new note.

But Georg, who was, after all, a student working his passage around the colonised planets and on his last lap before signing off the company's articles, had had enough of them.

He left the set at send, and hoped that the vague echo-y racket he made moving around the caretaker quarters would sound nicely alarming. He ate, serviced the suit with a thoroughness it might not otherwise have had during the entire trip and went outside, leaving the set to broadcast the silence of the void. Anyone listening to that for long would become at least as jumpy and irritable as he had felt since the intrusion into his solitude.

He hooked his line to the same ring, walked the girders and over the cargo globe. But he stopped at the crumpled metal surrounding the cylinder and stared at the soft metal just above the bent sheeting. He did not remember it being quite so shiny. But, perhaps he just hadn't looked so low down. Certainly he could see no movement taking place between the two masses; both seemed to move through space with exactly the same motion.

He stepped over the right-angle joint, straining himself perpendicular to the outside of the cylinder. He looked back at the cargo sphere. There was no perceptible movement. Perhaps he had been imagining things.....H'm. It didn't matter anyway, for he was safe enough with the line joining himself to his sanctuary.

And yet— Uneasily he walked along the cylinder to its end. From this more distant point he might see any swaying motion. He was turning to stare when he caught sight of some projection upon the highest point of the curved end of the cylinder.

He hesitated. From his rather awkward viewpoint it looked circular. Another hatch, perhaps. Yes, why not ? And it looked bigger than that alarmingly confining hole he'd previously found. He approached it cautiously.

Sunlight, even at that greater-than-Earth distance, glared a visible, scintillating scattering of light about the rounded, invitingly-large hatch cover. He halted, eyeing the glow ahead of him. A glow like that meant there was dust. Metal took a very long time to decay to dust. Even allowing for the incessant bombardment by tiny—and not so tiny—interplanetary particles, such an " atmosphere " of dust suggested great age.

Just how long had this cylinder been floating here ? Ship ? No, he felt he could no longer think of it as a ship. Not a ship of Earth origin, anyway. He watched the dust motes swirl as those disturbed by his own advance pushed and jostled the whole into activity.

He turned and backed to the hatchway, skirting it with the Sun's radiation piling up steadily on his back and occasionally glinting in the glass sides of the helmet. He located the handles. The hatch came up easily.

An inky black hole, six feet in diameter, beckoned him. For a few moments he remained staring down, holding open the hatchway, trying to decide what he ought to do.

Either the hole was bottomless, which was obviously ridiculous, or

it was painted with something like lampblack. The hatch was quite as massive as the others he had located.

Suddenly, on impulse, he stepped out over the blackness and let the magnets in his boots draw him gently down, just a little more quickly than the closing hatch above him.

He touched down, got his balance. By reaching up, he found he could touch the hatch above with the ends of his pincer fingers. He felt around in the darkness, circling the barrel-like space in which he found himself. If the light from his headlamp hadn't gleamed on his arms he would have thought it had gone out.

Feeling sure that he had made at least one complete revolution of the place, he set his back against the curved wall and started to cross to the other side. His second pace brought his boot up against something. Investigating with extensions to his pincer hands took time. There was an art in using such attachments. But at length he came to the conclusion that it was a wheel.

After some awkward manoeuvring, he managed to get himself with boots on one unseen side, holding the metal, and with both pincer attachments gripping the spokes of the wheel.

It turned quite easily with a right hand motion, screwing out at the same time, unclamping perhaps. An upwards pressure tended to push him away but he clung to the wheel continuing to turn it.

And the upwards pressure eased off to nothing and, suddenly, the wheel itself seemed to fall away below him, drawing him after it into the darkness.

Unable to stop, he hung on, swinging out in the slow motion of " free fall," around in an almost complete circle before he hit a smooth surface and jolted off.

His boots scraped metal, gripped it. He rose, swaying to an erect posture. His headlamp flashed on the hatch with the wheel and he leaned away to avoid it as it swung shut. Turning, he found he stood on the " floor " of a kind of inner anteroom, bare of ornament or furniture.

At his left was a door of quite astonishing height. It had a bar handle level with his face. And it appeared to be sealed with something like wax, stamped every few inches, very regularly with a variety of geometrical designs.

Georg held his breath as he reached out and closed the grips of his pincers over the handle. The seal shattered almost to dust. The tiny particles moved away from the line between door and wall, swirling around, telling Georg quite plainly that he was no longer in vacuum conditions, but enveloped in a gas of moderate pressure—a gas which had thrust out at him as he had opened the second door, just as air would have met him as he passed through an airlock into an Earth ship—

But this wasn't an Earth ship. Of that he was convinced. So, quite probably it wasn't air. Even if it had once been air, during the

ages it had been penned in this cylinder, chemical action must have taken place to some extent. No, the time to take off his suit was not yet.

He took a deep breath and pushed open the inner door. His headlamp swept the great hall inside and his eyes dilated in amazement. For a while he just stood, staring and staring. He was reminded of the science museums of Earth, of a tremendous complexity of machines and mechanisms in a kind of ordered disorder. They did not seem to serve any logical purpose. Indeed many of them, to his eyes, seemed half finished, or little more than models of some infinitely larger reality. And yet, look where he would, there seemed to be some kind of order, some kind of reasonable unreason, as though they had been arranged for some purpose—but not necessarily for the purpose for which each had originally been designed.

From floor to ceiling and from wall to wall, the close complexity filled the place, glinting, gleaming, shining and flashing his light back at him . . . except for a central aisle, if it could be called that. For it was twenty feet high and six feet wide.

He advanced into this aisle and felt first that he was in a submarine or a utility spaceship, and then that he was in a heavenly junk shop that specialised in such moderate complexities as radio and T.V. spares.

The aisle was a hundred feet long. At its end, he pushed open another sealed door, and again he stared. Here were machines and equipment and rows and rows of jars and lines of vats and many enclosed bins and large tanks and a miscellany of other things that all seemed to fit together in such a pattern as a self-contained workshop might have done. Even so, it was unfamiliar. If it did, indeed, have a purpose, Georg could not see it.

He shook his head and stared at lathes and drills; at workbenches holding half finished containers and electrical apparatus; at chemistry apparatus of a complexity beyond him, and at large, enclosed machines at the far end of the room.

He tramped the 100 foot length of the place and, with a shrug, pushed the door that waited him there.

The seal shattered. He pushed at the door, feeling that nothing beyond it could still surprise him. And yet, even so, he stared. His probing lance of light transfixed a skeleton so huge that it towered in grotesque parody of human bones, some sixteen feet high. The bones were perfectly white, scoured clean, polished . . .

He advanced uneasily towards them. They were fastened to the front of a gigantic machine—or at least it seemed to be a machine—that was almost completely enclosed by a facing of metal as thick as armour plating—armour plating, if that was what it was, that had not been welded or riveted but had been cast in a single piece in some gigantic furnace.

Georg moved sideways. The enclosed machine filled what he saw to be the entire remaining third of the cylinder. The light moved back to the skeleton as though it had the power to draw his attention. He saw then that there was a platform before it. By climbing to that platform he would be able to inspect that extraordinary collection of bones more closely.

He moved forward and up. The platform seemed to sway a little. The skeleton, quite apart from its size, was not wholly like that of Earth people. Even such basic bones as that of the thigh were very slender and strengthened by several small additional bones. And yet, in spite of this tendency and other differences in shape and detail of arrangement, Georg felt that the outline of the creature must have been, on the whole, uncannily human.

He shivered. He backed off the platform, allowed himself to drift to the floor by the attraction of his magnets, and backed out into the central hall, closing the door after him.

He found that he was breathing hard and that his heart beat much faster than was normal. He withdrew his arm from the suit's sleeve and glanced at his wrist watch. Already he had spent an hour in entering and exploring this weird place ! It hadn't seemed more than a few minutes.

The suit's oxygen apparatus was good for about twelve hours . . . An enclosed machine caught his attention.

He approached it thoughtfully. It was like the much larger machine beyond the door—— There was even a platform in front of it, and on the side facing the platform was a symbol in place of the gigantic skeleton. It was only a round thing in relief marked on either side by sections of the same arc. He stepped up on to the platform to have a closer look——

And the cover startled him by rising vertically, squeaking and shuddering its protests audibly and visibly. He turned uneasily to left and right, only to tell himself that all was dead here—that only the movement of his helmet made the shadows move.

Then he stared at the inexplicable patch of darkness revealed by the lifted cover. It seemed to be fixed on to the front of some totally unfamiliar arrangements of electrical components. It was a black fuzz —something not too solid in appearance. He poked it with the end of one pincer and the pincer met no resistance; yet disappeared, reappearing unharmed when he withdrew it.

He backed off the platform. It seemed to move slightly below his feet as he cleared it. At the same time he saw that the black fuzz had cleared. Behind where it had been a concave screen glowed momentarily and then showed a dull greyish white as he turned his light back towards it.

The cover came down, cutting off his view.

Mystery upon mystery. He began to feel he should again report to

the Deimos Drifterport. He made his way back along the room, stopping here and there to examine mechanisms that seemed familiar.

To examine a complex arrangement of tubes, wires and electrical components and to come to the conclusion that it was some kind of cathode tube, and then, however, to lose oneself in trying to understand the circuit and finally to suspect that it was some very much larger and probably quite unfamiliar apparatus, that was baffling—and to some extent frightening.

He finally went through the other room without pause, out through the airlock on to the outside. There, he felt for the line that had, all this time, been reeling in and out from the little container on his belt. And he missed it. He felt more anxiously. He would surely have felt . . . But, no, of course he would not have noticed it break. There had been from one to five doors closed over it. He found the loose end hanging from the reel.

Never mind. He could find his way back to the familiar world of the drifter without the line. He walked the length of the cylinder below the vast dome of stars. And he stopped at the end where the metal was scraped bright. *The drifter had gone.*

The drifter had gone. He found it hard to credit, for the two masses, the cylinder which was obviously so old that it might antedate even the human race, and the new, modern, cargo carrier which had brought him, had seemed so firmly fastened together.

Surely he had made some fantastic mistake? But how could he? No, the drifter had gone and he was doomed. He could not even tell which direction it had taken. Yet, it had no power of its own. How could it have moved?

Suddenly something very like hysteria made him want to laugh. He had moved it himself. Of course he had. Fool that he was. The cargo had taken the impact of the collision. The ships had been stuck together. The subsequent vibration had enlarged the gap torn in the cargo sphere, but hadn't been enough to part the ships.

He had done that, himself. It had been this confoundedly stiff suit. What an effort it had been each time he had negotiated the right angle turn between the sphere and the cylinder. Each time he had been pushing them further apart, very slightly, yes, because his size and strength was so puny by comparison, but in the hours that had passed since, the combined motions imparted by each of his pushes had been enough to take the drifter from his sight.

He stood there, on the edge of infinity and wondered if he would go mad.

There was nothing logical for him to do. Using the tiny cutting flame of his suit, he might sail off into space looking for the drifter. But how could he be sure that his host was not revolving—how long would it take him to search a cubic mile of space? And besides the

time, the flame would be using oxygen, depleting his reserves.

He stared behind the cylinder, hoping to see a star wink out. He felt sweat start from his face as he forced himself to turn slowly while his gaze swept the heavens.

Space was so very large. He was reluctant to cast off into its depths. If he had to die, he felt he would like to do so with his feet on something solid. He was, after all, a student, not a true spaceman.

He had been a fool not to have gone in a passenger ship for this last lap of his grand tour back to Earth. This was seeing altogether too much of space.

He looked down at the bulging end of the cylinder. Rays of the sun were refracted by the ages-old accumulation of dust motes. He stared as a projection—in a similar situation to the hatch on the other end—caught his attention. Not a hatch this time.

He swung slowly around the horizontal corner and approached it, finally backing into the sunlight and staring down at what was—without the slightest shadow of a doubt a mercury boiler using Sunpower as its source of energy.

He did not interfere with it. If it had been less bulky, less dangerous he would have hugged it perhaps. It was familiar.

He went slowly along the cylinder, pausing at, but not opening the two hatches. The first was approximately facing into the centre of that third compartment, the room of the giant enclosed machine. When he had looked into it, he had seen a small furnished area, strange, unearthly but certainly furnished. The second hatch covered nothing visible; its socket was not large enough to admit a being with a skeleton the size of that he had seen. But, well, there were, on his own drifter, similar sockets built into the framework to house quick release gear used by the space tugs. He began to feel there was some meaning to all this.

He clumped over the end to the big hatch and passed inside, swinging down on the hatch this time with an almost unreasonable confidence.

Before his feet scraped the floor, he was aware that something was different. But it was not until he was turning away from the hatch that he realised coherently what it was. The door of the anteroom was open. The hall beyond it was lit up. The open door at its end framed the third doorway, made small by perspective. All blazed with light. Even the anteroom was lit.

It was as though he was being welcomed back. He advanced cautiously into the aisle between the masses of electrical components. In silence so intense that he was aware of every creak and scrape made by the stiff suit, he passed through into the central compartment, found it empty; moved through into the third compartment and looked up at the immense skeleton.

Nothing happened. He turned slowly around. Somebody or some mechanism had turned on these lights. The stilly silence mocked him.

He swallowed hard. The skeleton drew his attention and he clambered on to the platform before it.

And the massive cover rose up towards the curving ceiling. He held his breath as it lifted. And stared in bewilderment.

This was a gigantic duplicate of the unknown gadget beneath the smaller cover. He frowned at the black fuzz. As he looked, however, it cleared slowly, like smoke and it seemed he was looking into a hole in space at a huge, semi-human figure who sat in golden sunshine looking at him, Georg Landers, with interest.

" When a Sun and planets are observed to be approaching conditions suitable for the evolution of intelligent life based on carbon atoms, the system is visited by our ships. As the development of planets is dependent upon so many factors, however, these ships merely make a survey, and pass on, leaving behind a space capsule containing a unit such as this you now see. Thus, when the life forms indigenous to the system reach a standard high enough for them to survey their own system, they will find this capsule, as you have done, and may apply, if they wish to enter the Galactic Federation of Carbon Based Life Forms——"

The huge humanoid touched an arm of his chair and the first voice ceased. The being's lips did not move, but somehow the astounded Georg could tell that he was being addressed on a more personal level.

" I see this has been a chance meeting. I have heard of such things, though they are extremely rare."

The being smiled.

" Your suit does not indicate a very advanced cultural level and I see you are expecting others of your kind to presently search out and perhaps destroy the capsule. But I see also that you are frightened. Do not be. You are young and your mind is that of one who learns. You shall be protected from the dangers that threaten you and later, if you wish it, you will be given instructions how to use the machines, the models and prefabricated sections of your capsule to make a gateway for intercourse with us and the inhabited planets of a million other stars."

The humanoid beckoned.

" Step through to me, Earthman."

E. R. James.

Not long ago we published an extremely interesting article by Mr. F. A. Roberts on Digital Computors. In the following article Mr. Newman, an industrial research chemist, explains the many uses to which these machines can be put.

AUTOMATION

By John Newman

The middle of this century sees the industries of Britain and the U.S.A. in the transition from the Age of Mechanisation to that of Automation. Automation, a word more widely used than automisation, refers to the replacement of manual and semi-automatic processes by fully automatic ones needing no human control.

This, the logical outcome of cybernetics and advances in technology, is done by using electronic digital computers to continually control and synchronise the operation of a series of machines. Complete instructions for a schedule of work are fed into the computer which, using the machines as extensions of itself, translates the instructions into electrical neural impulses. Each machine is then 'checked' thousands of times a second and all the information integrated in a memory bank. Errors are continually corrected and a repair crew signalled if a break-down occurs.

World War II gave the impetus for the design of closed loop servo-mechanisms, self correcting units utilising stable feed back systems. The particular use for these was the radar control of guns. From this work there stemmed a vast amount of technical knowledge and a new science, that of communication theory and control. These early computers were of the analogue type, each one designed for a specific job. They contained, in effect, a model in which the problem was set up

in a mechanical or electrical form and solved by measuring a resulting physical quantity, often a voltage differential or angle of turn. The accuracy of this measurement limited the accuracy of the computers.

1946 saw the completion of the first all electronic computer. Since then nearly one hundred have been built, mainly ' tailor made ' models for research work. These digital computers, so called because they use a binary number system in which all information is processed as combinations of 0 and 1, carry out additions and subtractions at the rate of several millions a second. The original emphasis was on the mathematical abilities of these machines and they were, and still are, used to solve complex numerical problems and to calculate such things as shell and rocket trajectories.

With the development of communication theory it was found that information other than purely numerical could be handled but the industrial applications were not immediately realised. Digital computers can be instructed to choose between alternatives, to correct errors, to integrate several types of data and carry out actions dependent on degrees of change in a system. In fact, all the mechanical jobs that a human control does. If equipped with an automatic typewriter it can translate from one language to another and carry out most routine office duties. It can perform any complex operation to any degree of accuracy as long as the problem and instructions can be broken down into the basic indissoluble units 0 and 1. There is not space here to describe how this can be done but most information can be so coded.

A digital computer contains few moving parts and nowadays need not be much larger than an office desk. The use of transistors has done away with most of the bulky, energy consuming electronic valves and contributed much to its reliability. The use of printed circuits would again reduce both its size and price. The only things it requires is a coding and decoding machine and a stable electric power supply.

A digital computer contains four sections. There is a control element which schedules the sequence of operations, a memory unit of the mercury delay type which stores information and a computing element which compares values and makes pre-selected choices between alternatives. There must also be means of adding and withdrawing information. These latter two functions are the slowest in all of the computer operations, for information can only be coded and decoded as fast as the human mind can work.

Machines can communicate directly with one another by means of electrical impulses. Humans can talk with one another by means of words, even if it involves the use of a dictionary, but for humans to communicate with machines there must be an intermediary which can convert human ideas into electrical thought and vice versa. Punched paper tapes, punched cards or magnetic tapes such as are used in audio recorders are utilised.

Many commercial business methods use punched cards but these, and punched tapes, can only be fed slowly into computers. A great deal of work is being done to improve magnetic tapes, for they can be fed in many times faster and so save much time. The process of impressing information on these media is slow, involving manual programming, and may involve a large proportion of the cost of using computers. In the future this can be offset by coding design specifications directly onto tapes, eliminating the costly intermediate process of preparing hand drawn engineering drawings for the machine shops.

The punched tapes or cards are automatically fed into the computer where the combinations of holes makes and breaks an electric circuit in particular sequences as metal fingers touch one another through the holes. Magnetic tape, paper impregnated with a ferromagnetic powder, is passed quickly over a magnetic pick-up where its variations of magnetic field cause varying electric currents.

Electronic computers can only follow the instructions fed into them; they have no free will and must have every single item of knowledge necessary for their operation expressed in simpler terms than would be used for a child.

But their speed and versatility more than make up for their simple minds and the application of such control units has revolutionised the concept of tools and design. Until now it has been cheaper to have a human operator to control equipment rather than completely automise it using old mechanical and electrical techniques, none of which could easily be changed to meet differing products and conditions.

The key to automation lies in using equipment and processes to which digital computers can be used, mechanical sensing units replacing the hands and eyes of the human operator. This can only be done by replacing present day machines with radically new types. And by removing the old concept of a machine as being an extension of the human hand. Most machines now in use have been designed for manual operation and, in many cases, they have been designed *down* to the human level. The same type of rethinking must be applied to products and processes, the whole being integrated with one another; the foremost factors being the *use* of the end product and the tools and processes available. To some extent this type of thinking has been applied to the petroleum industry and to some sections of the chemical industry where continuous liquid and gas flow reactions are carried out.

Nowadays most products are designed for production on available machines—manually operated machines—and are not suitable for automatic production. Once this concept has been broken down the problem then becomes one of redesign to use the newer methods to their fullest extent.

There are individual cases in which this has been done. During the last war methods of making propellers and bombshells were redesigned for automatic production by automatically stamping sections

out and then automatic welding instead of lengthy turning, drilling and contour grinding from solid metal blanks.

One would not think of radio sets, with their dozens of soldered connections and intricate wiring, as being amenable to automatic production. Such sets are simple enough for humans to make but would be difficult to produce automatically without extraordinarily complex machines. Yet by redesigning, using printed circuits on plastic bases with packaged electronic components, much of the complexity has been done away with and, in fact, a factory of this type was the first to be made fully automatic. Production was done in sections, each machine being linked to those on either side, with automatic testing and rejecting of sub-standard pieces between each unit. Even the final soldering of added components such as vacuum tubes and transistors can be done automatically, by dipping in molten solder. Such a production method is invaluable for the large scale manufacture of miniature radio and radar units for rockets and guided missiles. In this factory the main trouble met with was not in the production line but in the variation in properties of the added components. Perhaps the answer is the automation of *their* production.

It is best if a whole factory can be designed as a computer controlled unit. For long runs where the design of a product is not to be changed the factory becomes, in effect, one large machine designed for a specific job. Minor variations in the product can be made, as in textile weaving, but a textile producing machine designed as such cannot be changed over to, say, a bottling plant. There is no need for such flexibility.

However, for short runs and where the design and product need often be changed there must be flexibility and it is better to have a number of units which can be coupled together and adjusted for a particular job. Afterwards the production line can be dismantled and rebuilt for another run, using a different combination of machines. This can only be done by replacing present equipment with computer controlled machines, for only by continually metering such a flexible and varying production line can the whole be efficiently integrated without the use of excessive human labour.

But there may be an interim stage between present methods and full automation. Machine tools are already available which work from an electronic control box fitted with a magnetic tape. As a prototype is made on the machine by a skilled machinist the magnetic tape records the movements of the tools. This tape is then ' played back ' and the tools faithfully copy the original movements by means of servomechanism motors. This means that automatic operation can be used in the smallest machine shop for long or short runs. Any number of such machines can be linked by a mechanical handling system and the individual control boxes replaced by one large flexible control—a digital computer. Thus an automatic factory can be built up over

a fairly long transition period by replacing present day tools as they wear out.

But not only factories and machine shops can be automised. Routine office methods can be analysed, all the requisite information stored in tapes or cards and the whole processed automatically through a digital computer. Space consuming files, books and ledgers are no longer needed, the equivalent of a whole roomful of files recorded on magnetic tape can be stored in a medium size box. Any of the information stored can be available immediately by running the requisite part of a tape through an automatic typewriter or, for calculations, the tape can be directly fed into a computer. Human errors in taping information can be eliminated by 'coding' twice on two channels in the tape by different operators.

Human clerks can handle only a limited number of variables and business methods have been designed to take this and human mistakes into account. There are no mistakes with a digital computer and tremendous amounts of office and design work involving many variable selections can be carried out. Analysis of optimum methods can be done in a few minutes so that the results are immediately applicable. J. Lyons & Co., Ltd., are already using a digital computer to calculate the pay and P.A.Y.E. sheets for 1,500 workers in 40 minutes instead of the 225 man hours previously needed. For the remainder of the week it is used for calculations on guided missiles and industrial processes.

What of the future? Automation is the continuation of a trend begun back in the Stone Age when Man-to-be picked up a club and used it as an extension of his arm. It continued with the discovery of the wheel and then with the substitution of water and steam power for the labour of human muscles. Through the Industrial Revolution the trend became steeper, more and more functions of the human body were taken over by machines. The Age of Mechanisation came and with it the chief function of the industrial worker became that of the control unit.

Rather than create new patterns automation will continue this trend and all the others inherent in it. The ratio of capital equipment per worker will increase, for automatic tools are more expensive than manually operated ones. This will mean an increase in the capital cost of plant which will have to be offset by more efficient working and the use of less unskilled and semi-skilled labour. Electric motors will be the prime movers and, as electric power can be cheaply transmitted for long distances, the factories will be independent of nearby sources of fuel. This, together with the smaller amount of labour needed, will increase the tendency of factories to move away from cities where there are large labour markets. This decentralisation will

be accelerated by the development of atomic power on an industrial scale and the threat of atomic war.

Not everything can be converted to automatic production, there are many small scale or batch processes which can be done more efficiently under human control. Nor will any factory be workless, there will only be a decrease in numbers and a change in the types of workers needed. There will be an increased demand for top level engineers of all types, whilst machine operators and repetitive workers will be replaced by a smaller number of maintenance and repair engineers. There must be some vocational retraining but the overall result should be a large drop in the number of women in industry who now do many of the semi-skilled repetition jobs. But the change will be slow at first, limited by capital investments and the number of computer engineers available, even in the U.S.A. where there is a shortage of labour. But small digital computers are now being advertised for business and industrial use and have become standard equipment in the offices of economists and meteorologists.

Machines replaced human hands, machines replaced human muscles, machines now replace part of the human brain. The only part of Man's supremacy that machines have yet to replace is his imagination. For how long will this remain so ?

John Newman.

1954 Science Fiction Convention

This year Britain's main science fiction Convention will be held at The Grosvenor Hotel, Deansgate, Manchester, on the Whitsun holiday—June 5th and 6th, and the usual elaborate arrangements are being made for the two-day conference of professional celebrities, amateurs, fans and readers. As well as talks, discussions and films there will be several sketches and plays put on by fan groups from varying parts of the country.

This Convention will be the high-light of the year—write for information to The Treasurer, " The Supermancon," Brian H. Varley, Balmoral Hotel, 33 Princes Square, London, W.2.

Author Alan Barclay is beginning to build quite a reputation as a writer of space stories with a military setting, and this one fits the general pattern. Set a spy to catch a spy—even on Mars —providing you know the guilty part . . .

WALK INTO MY PARLOUR

By Alan Barclay

Jon Ledward set his car down in the middle of the parking lot and strolled over to the main entrance of the building. As he walked, he whistled. The name over the building said: ' Central Headquarters, Martian Internal Security,' and it was unusual for anyone either to stroll or to whistle when approaching it. Not that Martians whistled very much at any time.

A stocky uniformed guard stood on the step, feet astride, thumbs hooked in belt, eyeing him as he approached. Jon Ledward was recognisably a Terran though he wore Martian clothes, and he could feel the man hating him. He grinned at the guard.

There was a desk with the notice ' Enquiries ' above it and an N.C.O. in charge. The N.C.O. glanced up, recognised a Terran, and at once dropped his eyes to the papers in front of him.

Ledward leaned up against the desk, waiting. After a moment he coughed pointedly. The man looked up.

" Yes ? " he asked.

" I wish to see Colonel-General Bahl," Jon told him pleasantly.

" Got an appointment ? " the N.C.O. asked.

" No."

The man looked Ledward up and down. His manner, his poise, the typically Terran *eclat* with which he wore his Martian-made clothes irritated the man further.

" Probably you don't know who General Bahl is, fellow," he said, " so I'll tell you. General Bahl is I.C. this organisation and the

chances of any stray civilian like yourself dropping in without an appointment to waste the General's time are remote—quite remote."

" What you say," Ledward replied amiably, " is correct in a general way, but I think my case isn't quite ordinary . . . In fact, I'm certain that if you send my name up, General Bahl will see me without a moment's delay."

" You'll be wasting your time," the other insisted.

" That's okay. It's my time and I've got plenty . . ."

The man scowled and touched the communicator switch.

" Name ? " he grunted. Ledward told him.

He talked inaudibly into the instrument. Ledward crossed over to a chair and sat down. He sat quite still for ten minutes, without exhibiting any sign of impatience. At the end of that time he rose and went back to the desk.

" Sergeant," he said gently, " I don't believe you're really trying."

" You heard me try," the man grunted.

" You must try harder. Suppose the whole of your security organisation was at this moment trying to locate Jon Ledward while all the time you're having fun stalling me at the entrance ? "

" A likely story," the other scoffed.

" I wouldn't call it so myself. On the contrary, it would be rather an improbable coincidence—but just in case it should be true, I think you ought to try. If I'm wrong you can have some more fun making me hang about even longer."

The N.C.O. thought he didn't like Ledward's style of conversation any more than he liked his face or his fair wavy hair or his Terran drawl. He wished . . . Then he thought he wouldn't enjoy being a Corporal again, so he'd better play safe and take the advice offered.

Ledward was right. No sooner had the N.C.O. told someone who mattered that a Terran called Jon Ledward was in the entrance hall asking to see the General than things began to happen.

A lift started somewhere above and whined rapidly down to ground level. The doors opened and two guards hurtled out.

As soon as they caught sight of Ledward their rush tailed off into a gentle saunter which, however, took them to a position between Ledward and the exit. Another lift descended on the heels of the first. From this there emerged a young and highly polished junior officer.

" Mr. Ledward ? " this person asked. " I'm told you're asking for an interview with Colonel-General Bahl ? He happens to have no engagement just at present, fortunately for you. Will you come with me ? "

" It is fortunate, isn't it ? " Ledward agreed, mildly.

The two uniformed guards crowded behind them into the lift. The lift whistled upwards.

Ledward was conducted along a corridor and into a typical Martian office room, whose sealed windows looked out over the city towards the red sandhills. There were a number of people present, some uniformed, some not, but General Bahl was the dominating figure. He was a typical Martian so far as appearance went; small, thickset, dark, with tremendous chest development, indicative of lungs fully adjusted to the thin air of the planet. Ledward concluded from this that he must be a fourth or fifth generation Martian. He had about him an air of confidence and poise which few Martians possessed. He looked sharply at Ledward from under shaggy brows.

" Take a seat, Jon Ledward." His nod directed the latter into a chair opposite him. The other men in the room moved closer. " You wish to see me ? "

" Not exactly, General," Ledward confessed. He paused. He looked around. He saw an array of grim unsmiling Martian faces. " The fact is, I got a tip that your men were looking for me, so to save them further trouble I came along."

" Very good of you," the General replied, watching him keenly. " I wish everyone was so co-operative."

" You mistake my motives." Ledward replied smiling. " Had I waited till your men picked me up I might have had my face pushed hard against a wall, or a couple of ribs kicked in— accidentally, of course."

There was an instant of silence.

" Why ? " the General shot at him.

" I'm not a naturalised Martian; I was born on Earth and I look Terran. Martians dislike Terrans . . ." Ledward paused, sighed, then added unnecessarily, " It's a typical symptom of colonial inferiority complex."

Nobody spoke for quite a while after that. General Bahl continued to look at Ledward reflectively. Ledward sat comfortably in his chair. It isn't easy to remain at ease under such circumstances, smiling vaguely, waiting politely, without fidgeting or coughing or saying: " Er ! " or " Well . . .," especially within the precincts of the Martian Security Building, and especially under the eye of General Bahl.

Jon Ledward managed it.

General Bahl decided that Ledward was one of the coolest customers he had ever met.

" Aren't you wondering why we want to see you, Jon Ledward ?" he asked at last. The General never used the Terran ' Mister.'

" I'm simply dying of curiosity," Ledward assured him. No-one seemed less likely to die of that particular disease.

" What were you doing yesterday ? " the General asked, gently. As he spoke someone pressed a button which started a recording machine whizzing.

" I took a certain Senator's daughter out to dinner. The Senator would be angry if he knew . . . Must I give her name ? "

" What did you do earlier in the day ? "

" I went to Morao on business."

" When did you start and when did you arrive ? "

" I left here about ten minutes after ten and arrived about thirteen thirty."

" Our reports say you left your office at five minutes after ten and reached Morao about thirteen thirty-five."

" Could be." Ledward agreed indifferently.

" So the journey took three and a half hours— much longer than it need have done."

" I suppose so," Ledward agreed. " What am I supposed to have done with my spare time— robbed a bank ? "

" Why did you take so long ? " General Bahl insisted.

" Well," Ledward reflected, " I thought it inconvenient to arrive during lunch hour, so I set my automatics to slow cruising and ate my lunch in the air. What d'you suspect me of doing ? "

" You had time to touch down somewhere. Let's say over that branch road leading off the main Morao-Fayum highway . . ."

" A-h-h-h-h . . ." Ledward gave a long low whistle of understanding. " I recall now— There was a news item this morning— a certain Major Jenna, travelling by ground-car in that area, was robbed yesterday."

" Exactly," the General nodded. " Major Jenna's car ran into a bank of gas which had been sprayed across a cutting. The Major, his driver and his body-guard passed out. The safety controls brought the car to a halt. When the Major recovered consciousness he found that something very important was missing. There are indications that an air-car touched down nearby."

" Aren't I just a little too obvious as suspect ? " Ledward enquired.

" You passed overhead about that time," General Bahl pointed out. " You had time to do the job, and you're a Terran."

Ledward nodded. " From this I deduce that the thing stolen was a military secret. Why, of course ! " he nodded to himself. " That highway leads from Quintao Military Space-port. Quintao's used by shipping to and from Satellite Four—and Satellite Four, as every schoolboy knows, is devoted to military research . . ." Ledward looked round, brightly.

" Very clever," General Bahl exclaimed. " Could you round off your deductions by guessing what's been stolen ? "

His tone sounded ominous, but Ledward seemed blythely unaware of this.

" That isn't difficult. There's been a good deal of debunking of D-wave weapons recently. Your military men have taken to saying they're nothing more than science-fiction writers' dreams; this sort of

thing has been said so often recently that it just can't be true any longer. So I hazard a guess that Major Jenna's been robbed of data relating to Destructor-wave weapons."

There was another of the long pauses that tended to follow Ledward's remarks.

"Jon Ledward," the General observed, "I decided some time ago that you are an extremely clever man. But now you've been a little too clever, which means, in effect, that you aren't so clever after all. Up till a moment ago we had nothing against you at all. Nothing, that is, except your being overhead about the time the crime was committed, and the fact that you're a Terran . . . But now . . ."

"May I say a word?" Ledward interrupted. "I was born on Earth, certainly, but I emigrated eight years ago . . ."

General Bahl ignored the interruption.

". . . But you've talked too much. Your guesses are too good. I'm holding you here till I've solved this case."

Ledward looked discomposed for the first time, just a little.

"But, I say," he expostulated, "you can't do that . . . I've got my rights. What grounds have you for holding me?"

General Bahl grinned a rather wolfish grin.

"You're in unlawful possession of military secrets—those you've just quoted. I don't give a damn if you guessed them or deduced them or saw them in a crystal ball. I'm holding you till I'm satisfied about how you got them."

Ledward grinned also, a little ruefully. "I always did talk too much," he confessed.

The General turned to one of his officers.

"Take him away, Jelk. Treat him gently; get him anything he wants but don't let him send out any sort of message."

Ledward got up and prepared to follow his gaoler. He turned as he reached the door. "May I not at least send a message to the girl I was taking out to dinner tonight? No . . . Well . . ." he shrugged, and sauntered out of the room.

"What d'you think of him, gentlemen?" General Bahl asked.

"I hate all these Terrans," a man in Major's uniform grunted. "Let me persuade him for half an hour with a heat ray; that way we'll soon find out whether he's the culprit."

"Listen to me, Major," the General said sharply, "we simply daren't use these methods. If he's a Terran agent he's sure to have something planted on him so he can commit suicide—their usual trick is a little poison container embedded somewhere under their skin. When things get too tough for any captured agent, he squeezes this capsule or jerks his arm and out he goes like a light."

"Thus proving he's our man."

" True, but preventing us learning where he hid the documents or how he meant to get them off the planet."

" Do you think he's our man, sir ? " someone asked.

"I've no idea. He's certainly the *type* of man—cool, calm, humourous, highly civilised—"

" What d'you mean by that, General ? " another asked.

" I mean Ledward's a civilised cultured man—— so is the person who did the job. He chose to use a gas trap rather than blast the car and its occupants with gunfire."

" He can't be the man," another officer objected bluntly. " If he were he'd not dream of walking voluntarily into our Headquarters."

" He knew we were on his track," the black-browed Major put in.

" That's not sufficient reason for walking in on us— there are plenty of hideouts in the central deserts or in the Alps. He had his flier. He need only to lie up till a Terran scout ship comes to pick him up."

" That brings us back to our discussion. Tell us what you've done, Antoni."

Antoni, who was a civilian, moved forward.

" Well, fortunately, the next ship in from Earth's one of ours, the ***Martian Maid***. We can't stop her leaving again without causing a sensation, almost an international incident, but from the moment she touches down until she leaves again we can watch both crew and passengers, so that not so much as a grain of sand will get aboard uncounted. She's due in five days from now and takes off again fifteen days after that. The ship after that's a Terran. It comes in about six weeks from now."

" I see. So the affair will stay under control and leak-proof for over six weeks. What about the Navy, Milligan ? "

" Already arranged. We're putting four ships about half a million miles out. They'll carry out scanner searches. Nothing can get inwards or outwards without being spotted and overtaken. Ours is the easiest part of the job. Someone's just remarked that Mars is a big place with plenty of places to hide in, but from the point of view of the man behind a scanner, Mars is just a blob in space, the middle of absolutely dam' all."

" Very well," General Bahl concluded, " then here's the position. The documents were stolen by a Terran agent, either Ledward or another. They're still on Mars. The agent must get them out. We're able to stop all leaks for about six weeks. Therefore within that time we must find him, or at least the documents, if we have to turn over every stone on the surface of Mars."

" What do we do about Ledward, sir ? " someone asked.

" I want all the information you can get about that young man. Talk to his boss, and to that girl he was entertaining. See if anything can be found out about why he came to Mars. The rest of the work is routine. Check every Terran on Mars and see where he was yester-

day. Check anyone, Martian or Terran, who could have been within reach of that ambush. And," he added with grim humour, " when you've done all that come back and I'll think up something more for you to do.

Two days later Antoni brought General Bahl a report on Ledward.

" Give me the outline," the latter told him gruffly.

" Very good, sir," Antoni began. " Ledward's thirty-three. That's to say, twenty Earth years plus eight of ours. He went to some University in England. Degree in Civil Engineering . . ."

" Any military connections ? "

" Just a little. A probationary commission in the United Nations Army. Airport maintenance. He quit after six months."

" Why ? "

" Said he didn't like the brass."

" Well ? "

" Got a job with a Terran Engineering firm who had a contract here. On completion he had an offer from a local firm and stayed."

" Did he solicit this job ? "

" There's no doubt he did, but the firm was glad to have him; he's considered to be very good."

" How does he get along with the local people ? "

" Much better than most Terrans. He's had all the usual abuse and insults, but though he's powerful like most Terrans he's never resorted to any of their rough stuff—— you know, throwing folks out of windows or overturning cars—— he just laughs."

" I can imagine," General Bahl nodded. " What about his lady friends ? "

" He's got a lot of lady friends," Antoni agreed, "but in a very respectable sort of way. Good dancer; great conversationalist."

" I can imagine," General Bahl repeated. He got up and began to walk up and down the room.

" Let's suppose for a moment he's the culprit. What would you do if you'd stolen the plans, Antoni ? "

" I'd fly off into the desert and whistle up a Terran scout to take me off."

" But would you ? A radio with interplanetary range has a lot of bulk and needs a lot of power. And a scout ship would take about four weeks to reach you."

" Very well, sir, I wouldn't," Antoni agreed patiently. " And of course, if Ledward's our man, he didn't."

" Instead, still considering Ledward as suspect, he comes straight to us. The fly walks uninvited into the spider's parlour . . ."

" To avoid a beating-up."

" Rubbish ! " the General exclaimed. " A fellow with Ledward's nerve could talk our police into a condition of civility. Not only does

he come here but he makes sure he'll be kept here, by being over-smart with his guesses—if they were guesses."

" Yes, sir," Antoni agreed.

" Why did he come here and do all this ? " Bahl demanded, fixing his assistant with a piercing glare.

" I don't know, sir," the other admitted.

" No more do I. But if he's our man, he did it to further his escape from Mars. It's the first move of a series—now he's due to make a second—some proposal that will get him out into space—a proposal that we give him a ship, or . . . has he made any proposal, Antoni?"

" Matter of fact, he has, sir."

" Ah ! " the General exclaimed, in triumph. " Well ? "

" He says," the man reported precisely, " that the sooner you discover the culprit and let him out of this dump the better he'll be pleased; he says he'd like to speed up the process by helping you to interview the Terrans; he says he understands Terrans a whole lot better than we do, and he's better able to spot anything phoney in their stories."

The General looked disappointed.

" He says all that, does he ? Not at all the sort of proposition I expected. Nevertheless, we'll agree and see where it leads us. But put a recorder on him, Antoni."

Whatever Ledward's real intentions were, he managed to get the maximum amount of harmless fun out of his voluntary task. His first customer was a Terran geophysicist engaged on research work on Mars. The geophysicist sniffed a little when he saw Ledward seated at his table, and asked:

" Can't you get some other sort of work ? "

" What's the matter with this ? " Ledward asked in turn.

" It's rather distressing to see an obvious Terran in the employ of the Martian Security Police."

" Why not ? Earth has no intention of quarrelling with Mars."

" Agreed. But Mars is continually on the point of quarrelling with us, as you must very well know. Working with the Security Police, of all things! I find the situation singularly distasteful." Another sniff.

" I have my troubles," Ledward explained amiably. " Shall we get on ? " He proceeded to ask a few questions, but very soon the conversation got round to geophysics. They discussed that topic learnedly for half an hour. Ledward let the Professor go and reported that the old buzzard would never steal anything except perhaps some colleague's theories."

General Bahl listened to the recording of this discussion right through to the end.

" Enjoying himself, isn't he ? " Antoni observed.

" He is indeed, at our expense. He's guessed we've a recorder on him and he's made sure it got an earful."

Next day Ledward interviewed a girl of about twenty-two years old and Antoni brought another record to his boss. He looked puzzled.

" Do people back on Earth still speak other languages besides English, sir ? " he asked.

" Oh sure. Everyone knows English, of course, but the majority have a subsidiary native language also. Why ? "

" Listen to this, sir." Antoni switched on the playback. " It's Ledward's latest joke."

General Bahl listened.

The recorder shot out a torrent of enthusiastic feminine speech. The torrent was replaced after a moment or so by an almost equally torrential outpouring in deeper tones.

" They're speaking French," General Bahl explained.

" Really, sir ? " Antoni asked. Bahl glanced at him sharply. The conversational torrent flowed on. At one point it was interrupted briefly by a series of curious noises. Antoni saw to his amazement that the General was actually grinning.

" She's just kissed him," he explained. " It's because she's just learned he'd spent some time in Paris. The French are like that."

" Really, sir ? " Antoni said again. This time the General didn't glance at him— he made a mental note to check on Antoni sometime to see whether he was quite as humourless as he usually appeared. If I find him pulling my leg I'd better promote him, he resolved. Then he returned to listening to the conversation.

" What a man ! " he exclaimed at last. " Nevertheless," he added, " put a translater on these recordings and study carefully. Quite a lengthy and complicated code message could have passed across in the midst of that exchange of pleasantries. What report has he made on this woman ? "

" Here it is." Antoni held up a card.

The General read: " If this young woman ever took to espionage she would have no need to use gas-sprays."

There was an Englishman after that, who called Ledward an unutterable cad and then refused to answer his questions. Then there was a Spanish speaking South American with whom Ledward discussed the beauties of Rio de Janeiro. Finally there was a tall broad-shouldered Terran with whom Ledward at first talked in English. After a few minutes of conversation, however, the discussion was continued in another language.

" What d'you make of that, sir ? " Antoni asked General Bahl. There was just a faint flavour of triumph in his voice.

" Not a thing so far," the General confessed, listening intently. " Vaskemaskiner ! sounds as if it might mean washing-machine in somebody's language, and ' en maskin gjeur fyr manns arbeid ' sounds like someone talking in a very old-fashioned German dialect about a machine that did the work of four men, but it's difficult to believe

that here on Mars, especially in Security Headquarters, two people would devote their time to a discussion of that sort. Do you know what it's about ? "

" Yes, sir," Antoni admitted. " The Terran man being interviewed is of Norwegian parentage. He's come over to Mars to start a factory making a special kind of washing-machine which is very economical in its use of water."

" Ah ! " the General exclaimed, pleased for an instant that his guess was correct. Then he crossed over to the wall and pressed a couple of buttons of his encyclopaedia. After an instant the grave voice of the encyclopaedia spoke: " Norwegian, one of the Nordic dialects, resembling Swedish and Danish, originally spoken in its modern recorded form by about three million Terran Norwegians, now almost obsolete and forgotten; possessing many unusual vowel sounds; archaic in style . . ."

The General pressed another button. The voice ceased in mid-sentence.

" What chance have we of getting a reliable translation of this ? " he demanded.

" Very little," Antoni admitted. " We'll search the records for people of Norwegian origin, but . . ."

" So," General Bahl reflected, " I'm convinced this is the move we're expecting Ledward to make. Even before the breakdown of national boundaries this language was never spoken by more than three million Terran Europeans. Now it's obsolete. Yet here, in Mars, in our security headquarters we have a suspect—two suspects, in fact—exchanging information in what is virtually a secret code. Very fishy ! It's so fishy, in fact, that it's not particularly clever. I think we might embarrass the suave and polished Mr. Ledward considerably if we asked why he's so fluent in such an obscure language."

" I'd like to see that young man embarrassed," Antoni confessed. " Shall I send for him, sir ? "

" Yes," the General nodded. " I see he hasn't made any report on the Norwegian Terran yet. We'll ask him that first. If the man—— what's his name ? "

" Harry Lund."

" If Harry Lund's a co-spy Ledward's most reliable line is to paint him whiter than driven snow."

" Slightly unusual for spies to discuss their plans in Security Headquarters, sir," Antoni pointed out.

General Bahl looked up at Antoni from under his shaggy eyebrows.

" Got any ideas yourself ? " he barked.

" Yes, sir," Antoni said primly.

" Spill them, then."

" I don't believe Ledward's the principal actor in the plot at all. He's got the job of attracting our attention, drawing suspicion on him-

self, while his leader and the bundle of documents move off in some other direction."

"And this Norwegian . . . ?"

"He's a chance factor. He merely happened to turn up and Ledward resolved to put on an act with him."

"Having hastily acquired a knowledge of the Norwegian language in order to do so, I suppose?" the General asked sarcastically, then added: "I admit it's a theory worth considering, but I prefer my own. I bet you ten Dinars the Norwegian's a messenger and that Ledward tries to whitewash him. Fetch him in."

Ledward arrived five minutes later. He looked as unruffled as ever. He might almost be said to have strolled into the room. General Bahl found himself rather unreasonably hoping that the man would be proved innocent after all.

"I sent for you to hear what you have to say about this man Harry Lund," he said.

"So you feel the same about him as I do, General?" Ledward observed. "I'd just finished making out my report on Lund when you sent for me. There it is." He flipped a piece of paper across the desk.

The General looked down at the piece of paper and read it. On it was written simply: "This is the man you are looking for."

General Bahl scowled. He did this merely to conceal his confusion. Then he handed the paper to Antoni.

"What has made you reach this conclusion, Jon Ledward?"

"Intuition chiefly," the other replied. "I talked to him in his own language, as no doubt you know . . ." He nodded his head gently towards the speech recorder, ". . . and I asked him about this and that. I invited him to tell me where he had been about the time the crime was committed. He told me he was out Ankh hunting in a low-level flier."

"Well?"

"He's very keen on that sport. Knows all its finer points. I asked whether he'd passed over the Quintao road district. He said that would have been a waste of time for the Ankh were driven out of that area years ago."

"What of that? It's quite true."

"Don't you see, General? The story's phoney. He's been on Mars less than a year. He can scarcely have adjusted himself to Mars' gravity yet. It's suicide for any Terran to go skimming along five feet off the ground at a hundred miles an hour. Oh, no doubt he went out in a flier. No doubt he said he was going after Ankh. In fact, I bet that he can prove he's done the same thing often—but only so's to build up a cover story."

" I agree it's a good cover story. It could explain his being anywhere out in the desert any time—but it's rather slender evidence."

" That sort of evidence made you suspect me," Ledward retorted. " I was doing nothing worse than mooching about that part of the desert at the time."

" It wasn't that alone," the General pointed out. " You talked too much, remember ? "

" I remember," Ledward admitted, grinning ruefully. " By the way, I've never quite understood why you didn't try to coax me to talk with a red-hot poker or something. Wasn't the idea even considered ? "

" It was," General Bahl told him grimly, " but the suicide devices carried by modern spies are much too effective."

Ledward looked puzzled for an instant, then his face cleared. " I see—any real spy would have a gadget inside him so he could do a permanent fade-out when things got too tough."

The General was watching him closely as Ledward said this. If this was acting innocently it was the most polished act anyone had ever put across.

" Exactly," he said gruffly, " but let's get back to this Norwegian. You think he's the man, merely because he could have been in that area at that time ? "

" There's more to it than that. His whole manner and way of speaking cried fake, especially while I was asking where he was at the time of the robbery."

" So what do you suggest ? "

" Well, isn't it simple ? " Ledward asked. " He's got the documents hidden somewhere in the desert—— five paces nor' nor' east of the blasted oak, sort of thing. But he must get them off Mars pretty soon. Therefore, if you watch him, you'll catch him trying to do it."

" Tell me how he means to get them off Mars," General Bahl invited.

" Sorry," Ledward grinned. " I'm no mind reader."

" Very well," the General nodded. " We'll add Harry Lund to our list of suspects."

"Are you willing to release me now, General ? " Ledward asked meekly

" I'll think about it."

Ledward rose to go.

" One thing more, Jon Ledward," Antoni said in his prim voice, " how does it happen you speak Norwegian so fluently ? "

Ledward paused. He was just within range of the opener-ray, so that the door began slowly to open behind him.

" Oh, that ? " he said carelessly. " Didn't you know my mother was Norwegain ? " He smiled and went out.

" So you were sure he'd be embarrassed, eh ? " General Bahl asked Antoni.

" I was wrong," the latter admitted.

" And you thought he'd try to whitewash the Norwegian ? "

" Yes, sir," Antoni admitted again, " So did you, sir ! "

The General made a growling noise in his throat.

" Let Harry Lund go and have him watched. Turn Ledward loose also tomorrow morning. Watch him too. Put two of our best men on."

" Shall I try to get this Norwegian conversation translated ? "

" Yes, of course, but it won't tell us a thing."

Three days later.

" Sir," Antoni said to General Bahl.

" Very well, Antoni, whatever is it ? "

" A disturbance has just occurred down at the main entrance."

" What's that to me ? " the General growled. " The desk N.C.O. can attend to that. It's what he's there for."

" Yes, sir. He tried to."

The General put down the papers he was studying.

" Stop being mysterious," he ordered.

" It's Ledward again, sir. He asked to see you. The N.C.O. told him to wait. There was a bit of a— difference of opinion . . ."

" Well ? "

" Ledward bounced the N.C.O. through the window. Then he used the desk communicator himself."

" The more I hear about Ledward the more I admire him. Of course I'll see him, but before you bring him here tell me what he's been doing since we let him out."

" He went straight off to find that girl . . . you remember ? "

" The one who spoke French ? "

" Yes, sir. He took her out in his air-car—out over the desert—then back. They had dinner at that place by the canal—the Red Lion. Terran food—Terran music—fake Terran architecture . . ."

" I know it . . . what else do you know ? "

" They went back up in the air and cruised around at five thousand all night, no doubt running on automatic. As to what they did . . ." Antoni stopped abruptly, pressed his prim lips together disapprovingly, and then added- " The Norwegian Harry Lund was in the Red Lion and Ledward spoke to him."

" Ah ! What was said ? "

" Nothing much. Something like: ' See you in some other gaol again some time ! ' Lund didn't answer."

" Nothing much in that. Most Terrans go to that particular Restaurant. Anything else ? "

" Spent the rest of his time tailing Lund."

" Well, fancy that now ! Where did the tailing lead ? "

" Out towards Quintao Space Port. Lund passed to eastward of it, then circled and came home."

" All this sounds very significant, but what it signifies I have no idea," General Bahl reflected. " Let's see what Ledward has to say."

Ledward strolled in and sat down. General Bahl scowled at him.

" Been having fun ? " he asked.

Ledward's eyes widened. He looked excessively innocent.

" Evidently you've heard about my French young lady. I assure you . . ."

" I'm not particularly interested in your amorous adventures. At least, I'm not professionally interested in them. Besides, I suspect you stopped out all night merely to give my men something interesting to report. Right ? "

" Could be," Ledward admitted.

" You wanted to see me, I'm told."

" I do—— I have a suggestion to make."

" Ah ! " General Bahl thought to himself. " Everything till now has been merely preparation, but now comes the key move." Then aloud: " I could use a few good suggestions on this case."

" I've told you I think Lund's the man you want. You know I've been keeping an eye on him these last three days. I've no doubt you've heard he's been looking over Quintao Space Port ? "

" Yes, I know all that. And also we have thirteen light space-scouts parked there. But all this doesn't worry me a lot. In the first place, the scouts are well guarded, and in the second place, you know as well as I do they haven't got the range to make the Mars-Earth run."

" True, General," Ledward agreed. " But here's how I see the problem. Perhaps Lund's chances of seizing a scout are slim, but he may be desperate enough now to take a slim chance, or he may have some plan which will reduce the odds against him."

" Even if he gets one it won't take him home."

" Not quite, but if he runs at maximum acceleration while his fuel lasts he'll get near enough Terra to put out a signal. They can send up a ship for him."

" I admit that point . . . So we must make perfectly certain he doesn't grab a scout."

" May I make an alternative suggestion ? "

" You may indeed," the General assured him enthusiastically, looking slyly up towards Antoni.

" Make sure the fuel-tanks of every scout ship are two-thirds empty —leave just enough fuel to get right out into space—but fix the meters so they read full. Get my idea ? "

" So far," the General nodded. " Go on."

" Leave the guards on the ships. It would smell too rat-like if they were removed, but see that it isn't impossible to get past them to the ships."

" Well ? ' the General leaned forward.

" Arrange that only one ship has its tanks full, but in this case fix the meters to read empty. Now this is what I believe will happen. Lund's got the documents planted out in the desert but he won't go anywhere near them till he sees a way of escape. And if he comes sniffing round Quintao again after we've made these preparations, he'll see it. Right. So he goes back into the desert, lifts the documents flies back, bumps a guard or two, makes for the scout he's already checked for full tanks, and blasts off." Ledward paused, but the General said nothing. " Of course," the former resumed, " we blast off on his tail and keep after him till his fuel runs out, then pick him up, *and* the documents."

" It's clever," the General admitted at last, cautiously. " In effect, you're drawing the enemy into the open, causing the man himself to bring the documents into our trap. Very smart . . . Who did you intend should chase him ? "

" Well, since this is my idea I feel entitled to see it through. I realise you'll feel it necessary to send a man along in case I go off in the wrong direction once I get the documents, of course . . ."

The General considered this proposal in silence for a little while.

" I see," he said at length, " an ingenious trap, if Lund is indeed our man, and if the notion of stealing the scout-ships is already in his mind, then it can scarcely fail." He pondered the idea some more.

" Very well," he agreed finally, " it'll cost nothing to try. I'll have arrangements made immediately and tomorrow we'll discuss the plan in detail."

" Once again," General Bahl observed when Ledward had gone, " he hasn't made the sort of proposal I expected. I thought he would ask leave to go home to see his widowed mother or bereaved sister now that he's proved his innocence. I expected to see real telegrams from a real mother or bona fide proofs that his sister's bereavement was genuine. Instead he presents us with a water-tight plan for capturing the criminal."

" Assuming the criminal is Lund," Antoni pointed out.

" Exactly. But if Ledward is innocent his scheme is excellent. Do you still think he's the criminal ? "

" Sir," Antoni replied, " except at the very start of the investigation I never supposed Ledward to be the chief criminal. I've always considered him to be a diversion, and according to this theory, while Ledward is providing us with his particular brand of light entertainment here, the documents are being handled by some other person altogether on another part of Mars."

" It's a good theory," the General admitted, " but I don't find it acceptable. I believe now he's entirely innocent and giving us real aid towards capturing the criminal. Alternatively I believe he's the master-mind himself trying to use us as dupes."

"But you can't believe both theories simultaneously," Antoni pointed out seriously.

"I can, very nearly," General Bahl told him crossly. "I believe the first theory every day up to lunch-time and the second from then onwards."

"So what will you do about the scheme, General?"

"I mean to go forward with Ledward's plan. In the first place, if he's innocent and his suspicions of Lund are well-founded, it's too good a plan to be disregarded. On the other hand, if he is the party we're after, his plan will bring himself, the documents, and his assistant, if that's what Lund is, together out into the open—"

"——the open in this case being a million miles out into space in the direction of Earth—"

"But it's none the less open for that, and don't forget we're not allowing Ledward to do this job alone."

"The man you send along will have to be smart—— one of our very best, sir. Ledward will be very difficult to manage in these circumstances; the control compartment of a space-scout is rather cramped for manoeuvring."

"I realise that," General Bahl admitted. "So fully do I realise it that I've decided to go along with Ledward myself. And I'll take my hand-gun—— and I'll make sure Ledward doesn't have his."

On the wide level dusty expanse of Quintao Space Port, scout ships stood on their tails like slender chess-men on a chess-board. It was night, but not a light showed from any of the ships. Up in the nose of one of them, a hundred and fifty feet off the ground, Ledward lay comfortably on an acceleration couch. He was looking upwards through the transparent dome watching the moon Deimos scurry past overhead. He was whistling softly to himself and seemed to be completely at ease. General Bahl occupied the other couch. He also lay quite still. He was listening to the private wave communicator on his wrist.

"Lund's air-car just passed overhead," the small voice of the communicator told him.

"What direction?" the General asked.

"Towards Quintao," the voice replied.

"Very well. Better be on the alert now, Number Two. He should touch down in less than ten minutes."

"Very good, sir."

"You don't mean to trail him round the desert, I hope?" Ledward asked.

"Don't worry. We won't do anything to scare him off. Nobody cares where he hid the plans so long as he brings them to us."

"Good enough," Ledward agreed equably.

In the next ten minutes the moon Deimos passed right across his field of vision and out of sight. Then a little voice spoke again from the radio.

" Air-car just touched down behind the sand-hills— The man gets out . . . He's moving in your direction."

" It'll take him nearly an hour to crawl past the guard and work his way across here to the ships," General Bahl estimated.

During that hour Ledward, so far as his companion could discern, lay tranquilly, half-dozing. No further reports came over the communicator, until : " Sir ! " a voice tinged with a little excitement broke the silence, " He's approaching the ship you're in. He's right alongside now."

" Now there's a chance I never thought of," General Bahl exclaimed. " If he comes up here we'll get him at once. No need to chase after him in space . . ."

" But keep still, General," Ledward cautioned. " You know how the least noise echoes in these space-cans."

In a few minutes they could actually hear faint scuffling noises from below, but the noises never seemed to come very near, and presently ceased altogether.

" He's out in the open again," the watcher informed them. " I can just see a dark blob crossing to another ship."

" He must have flicked the meter-switch of our fuel-tanks," the General surmised. " They're reading empty, of course."

" He's in the ship next yours, General," the watcher said.

" Right," the General settled himself on his couch and swung the control panel over towards him. " We blast off five minutes after him. He must not discover we're on his tail until he's too far out to run back to cover. The naval ships will move inwards in case he doubles back. We want him to keep going straight out until his fuel's exhausted."

" Primary fire from jets, sir," the watcher informed them.

A moment later they heard the roar of motors and a glow of orange light glared briefly into their cabin as the escaping ship towered upwards on its pillar of flame.

" Here we go," the General said, stabbing the starter button.

Ledward looked up from his couch and saw the other ship lying off to starboard. The last feeble splutters of flame were coming from their jets as he watched. The General began manoeuvring to come alongside.

" Call him up now, Ledward," the General suggested. " Tell him he's run his course. If he surrenders now without making any sort of useless struggle, he'll probably get away with a prison sentence."

" Very well, General," Ledward agreed. " You don't object if I do my persuading in Norwegian ? It'll sound friendlier."

" I don't mind at all . . . the game's played out. I'd be very glad to wind it up completely without having to shoot him or drive him to do anything foolishly heroic like shooting himself."

Ledward turned to the radio while the General began jockeying his ship alongsidé the other.

" Hullo, Lund ! Jeg Kalle pa Harry Lund i spieder skib A-fyr. Her er Ledvard."

" Hullo, Ledward," a voice boomed out loudly in reply. " Had a nice trip ? "

" La oss snakke Norske," Ledward replied, glancing across at the General who was looking out to port intent on making his approach, then continued in the same language.

" Everything according to plan ? "

" Of course," the other replied. " How with you ? "

" The same. I have an important person here beside me, so don't talk too freely. He asks me to say that since you're beaten it would be sensible to surrender. He assured me you'll get off with a prison sentence."

" So what do I do ? "

" Accept . . . We'll transfer you to this ship. When I give you the sign, start a fuss to distract his attention. I'll quieten him then. Not difficult, with three of us together in this small space. Understood ? "

" Certainly . . . Your ship's got enough fuel ? "

" The tanks were full when we took off after you, my boy. Nothing can catch us. Now just in case we have trouble, have you got the stuff in the drawer beneath the astrologer computer, as I told you ? "

" I . . . Yes, I put it where you told me."

" Good. Then let's talk a little longer. I'm supposed to be trying to induce you to surrender."

General Bahl appeared to be concentrating on the controls in front of him. In fact, however, he was concentrating with all his mind on the curious Norwegian conversation going on just behind him. On the whole, he felt a little disappointed. A nice fellow, Ledward, witty, intelligent, cool as a cucumber, clever up to a point—but not really a first-class intelligence. His biggest mistake was this Norwegian lan-language stunt. He ought to have realised that it would have so much the appearance of being a secret code that it was certain to arouse suspicion—and he ought to have realised that anyone like General Bahl who was already an expert liguist and a specialist on the European language group could very soon make himself sufficiently familiar with Norwegian to follow the trend of the conversation. Besides, now that Ledward had given himself away by this conversation, now that the General knew for sure that he was the enemy agent, how transparent all his tricks and devices seemed. The General knew he would probably have to kill Ledward within the next half hour, and he did not

take any pleasure in the thought. General Bahl, head of the Martian Security Organisation, was one of the few Martians who really liked the Terrans.

The two ships drifted together, nose to tail. The General extended the magnetic grapple which pulled the two space-locks into line. He waited till the green light flashed to indicate that the exit locks were linked together. He knew he was in a position of considerable danger. He must be sure not to turn his back on Ledward, and above all, he reminded himself, the essential thing was the bundle of documents. He must get to them as quickly as he could and stay with them.

" I take it Lund's willing to surrender ? " he asked. " Then tell him to come through."

Ledward did so, speaking in English this time.

They heard the noise of valves opening and closing, then the scraping of feet. Harry Lund appeared, floating himself slowly out of the tube.

General Bahl was a realist. He had no intention of trifling with the situation. As Lund's downward-facing head floated within his reached he whipped out his needle-gun and belted the man over the head with the butt. The force of the blow drove Lund's face down against the floor.

" A bit rough, General," Ledward protested.

" Safest to keep him quiet a while," the General explained. He had room in his mind at the moment for one idea only. He must get through the lock into the other ship. He must get to the documents and stay with them. He moved towards the lock tube. He managed to cross the cabin without turning his back on Ledward. The gun with which he had knocked out Lund still dangled in his hand. He slid himself feet first along the tube towards the lock.

" Keep things under control while I search for the stuff," he ordered as he floated out of Ledward's view.

He passed through the valve, along the extensible tube which linked the ships and through the lock into the other vessel. He punted himself across the cabin to the computer table. As he reached it he heard the lock of his own ship close with a thud. At the same instant the radio spoke.

" General Bahl," Ledward's voice called.

" What is it, Ledward ? " he asked, trying to appear unconcerned.

" I've closed the lock and sealed off this ship. You must have heard the noise— I'm going to blast off in a minute and the inter-ship tube will be wrenched off. I don't particularly wish to kill you, so I'll give you a couple of minutes to close the lock your side."

Something began to spin round inside the General's brain as he heard these words. The idea struck him with tremendous force that he had been tricked . . . Somehow, somewhere, something had gone astray—— and yet he had the documents, or at any rate, he had command of the ship that held the documents, so there could be nothing wrong.

" General Bahl," Ledward's voice spoke again, urgently this time. " I've no time to waste—your naval ships may get after me any moment. We have the documents here. When Lund came aboard to test the fuel supply at Quintao he stowed them in the motor-room. The game is played out, General. Close your lock and save your life at least."

" I see," the General replied slowly. " I see it all now. A very effective set of moves—— a chess-game played by a master. I congratulate you."

" Close your lock, there's a good chap," Ledward urged.

" I think I won't bother," the General answered. " After this little affair I shall be disgraced. Inevitably I'll be suspected of having aided you. Thank you for your consideration but no—— go right ahead."

" As you wish, General," Ledward's voice sounded regretful, " but first have a look in the drawer below the computer. Although the plans aren't there we did leave something of interest for you."

The General rather absently pulled open the drawer. As it slid forward there was a small plop and a spray of gas shot upwards into his face. He was unconscious in an instant. In the gravity-less ship he remained where he was, seated on the edge of the pilot's chair, swaying a little.

He awoke to find himself lying comfortably on an acceleration couch. He was in fact strapped to the couch. He heard the roar and rumble of motors and judged by his weight that the ship must be making at least two-g. Ledward, lying on the other couch, looked across to him smilingly.

" I couldn't have your suicide on my conscience," he said. " I'm giving you a free trip to Earth instead."

" What'll you do with me there ? " the General growled.

" Nothing at all," Ledward assured him. " You know very well that we Terrans don't have any quarrel with Martians—— we think you're a little quarrelsome and self-assertive, that's all. I promise you won't even be cross-questioned."

" You wouldn't get much from me if you did."

" I know . . . That's why we won't bother . . . Perhaps we might go to Paris together—— or Norway ? "

Alan Barclay.

The mock-up Moon rocket being built by the American Society for Space Flight is nearing completion, but Clifton's murder complicates the final details and Michael Novak takes over. From here on it is success or failure for the Society—with the espionage net drawing tighter about Novak's neck every hour.

TAKEOFF

By Cyril M. Kornbluth

Illustrated by QUINN

Part Two of Three Parts

FOREWORD

Michael Novak, ceramic engineer, working in the Nuclear Energy for the Propulsion of Aircraft (NEPA), Division of the U.S. Atomic Energy Commission, is inexplicably transferred to the Argonne National Laboratory in Chicago where his particular talents are entirely wasted in the field of pure nuclear theory. Attempting in vain to get a suitable transfer he forcibly resigns and attempts to get a job elsewhere. The fact that he had struck the Research Director when handing in his resignation goes against him wherever he applies, and he is getting more than despondent when he receives a curious letter from a Los Angeles office offering him fulltime work in refractories research and development with high-altitude jet aircraft.

Intrigued by the apparent mystery he travels to Los Angeles and is appalled to find that the office belongs to an obscure amateur organisation known as the American Society for Space Flight. *He meets Mr. Friml, the Secretary, and Mr. MacIlheny the President, who assure him that the Society has a progressive programme of development, plus laboratories and a prooving ground and unlimited capital, but refuse to disclose where their funds are obtained. Sceptical but still intrigued, Novak goes with*

Friml to the Society's launching ground and is amazed to find a full-scale steel mock-up of a space ship standing on the field.

He is introduced to Clifton the engineer in charge of construction and Friml explains that the one thing lacking is a suitable fuel. He has already been to see Daniel Holland, chief of the U.S. Atomic Energy Commission, in Washington, but the Government were not interested in producing a fuel for the Society. Their plan, states Friml, is to complete the ship and then the Government would be forced to do something about the propulsion unit before any other World power became too interested in the project.

Novak accepts the position, is assigned a workshop and laboratory, and commences work on the firing chambers and throat linings for the Proto-type, *as the rocket had been named. He soon finds out that most of the 'technicians' working on the project are part-time enthusiasts, and meets Amelia Stuart, daughter of the chief of Western Aircraft, who, apart from being attractive, also holds numerous scientific degrees.*

Studying the plans for the fuel chambers, Novak gets the idea that the Society is being financed by foreign backers and tells his suspicions to Clifton. The two of them make a report to Anheier of the A.E.C. Security Office in the local Federal Building, who seems to know more about everyone concerned in the space project than could be expected. He infers that they mind their own business.

In the evening, having spent a pleasant afternoon with Clifton and his wife Lilly at their home, Novak goes with them to a meeting of the Rocket Society where he is introduced and makes a speech. During the science fiction film which follows Cliff leaves Lilly and Novak for a few minutes. As he doesn't return Novak goes to look for him. He finds Cliff's gold ring on a basin in the washroom and is then horrified to discover a thread of crimson blood seeping under a closed toilet door.

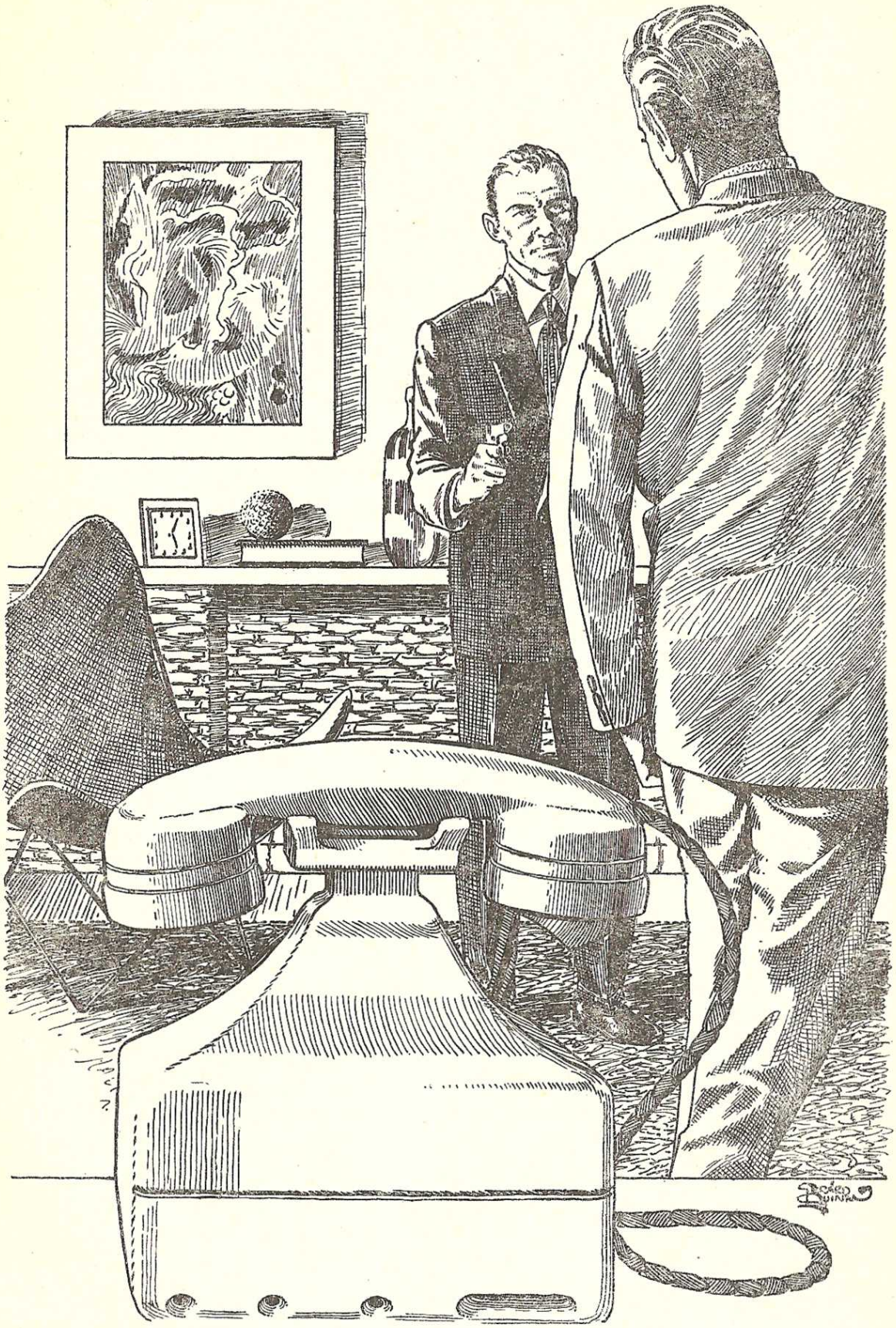
VII.

Novak fell on his hands and knees to peer through the six-inch gap between the bottom of the door and the floor. He saw two shod feet, oddly lax, a dangling hand, a little pool of blood, and a small pistol.

He went to pieces and pounded on the door, shouting. It was latched. Novak darted from the washroom to the main hall; Anheier was there, who didn't believe there was anything to their story. He blundered into the darkness where, on the screen, two silvery space ships of the impossible future were slashing at each other with many-coloured rays that cracked and roared on the sound track.

"*Anheier*!" Novak yelled hysterically. "Where are you?" Dark heads turned to stare at him. Somebody stumbled his way across a row of knees and hurried to him.

"Dr. Novak?" asked the Security man. "What's the matter?" People shushed them loudly, and Anheier took Novak's arm, drawing him into the corridor.



Novak said: " There's somebody in a booth in the washroom. I saw blood. And a gun. I'm afraid it's Clifton."

Anheier hurried down the corridor without a word. In the washroom he went into an adjoining booth and climbed up on its bowl to peer over the partition.

" Bad," he said flatly, hopping down. He took a long nail file from his pocket, inserted it between the door edge and jamb and flipped up the latch. The door swung open outwards. " Don't touch anything," Anheier said.

Clifton was in the booth. His clothes were arranged. He was sprawled on the seat with his head down on his chest and his shoulders against the rear wall. There was a great hole in the back of his head, below the crown.

" Get to a phone," Anheier said. " Call the city police and report a homicide here."

Novak remembered a pay phone in the lobby downstairs and ran. Just like a magazine cartoon he crazily thought, when he found a woman talking in it on the other side of the folding glass door. He rapped on the glass imperatively and the woman turned. It was Amy Stuart. She smiled recognition, spoke another few words into the phone, and decisively hung up.

" I'm sorry to be such a gossip," she said, " but that bloody movie—"

" Thanks," he said hastily, and ducked into the phone booth. He saw Lilly coming down the stairs, looking more than a little worried.

The police switchboard took his call with glacial calm and said not to do anything, there would be a car there in less than five minutes.

Lilly and the Stuart girl were waiting outside. " Mike," Lilly burst out, " what's wrong ? I sent you out to look for Cliff, you come back and holler for that A.E.C. feller, and you run to the phone. You talk straight vit' me please, Mike."

" Lilly," he said, " Cliff's dead. Shot to death. I'm—— I'm sorry——"

She said something in a foreign language and fainted on his arm. Amy Stuart said sharply: " Here. Into this chair." He lugged her clumsily into a deep, leather club chair.

" Was what you said true ? " she demanded angrily, doing things to Lilly's clothes.

" Quite true," he said. " There's an A.E.C. Security man there now. I was calling the police. Do you know Mrs. Clifton ? "

" Fairly well. How horrible for her. They loved each other. What could have happened ? *What could have happened* ? " Her voice was shrill.

" Take it easy," he told her flatly. " I think you're getting hysterical and that won't do any good."

She swallowed. " Yes—I suppose I was." She fussed efficiently over Lilly for a moment or two. " That's all," she said. " Nothing

else you can do for a faint. God, how horrible for her ! God, how I hate killers and killing. That bloody movie. World of tomorrow. Death rays flash the life out of five hundred people aboard a ship—call them Space Pirates and it's all right. Call them Space Navy and it's all right too, as long as you kill Space Pirates to match. They're sitting up there laughing at it. What'll they think when they come out and find somebody's really dead ? Who could have done it, Dr. Novak ? It's unbelievable."

" I believe it. Miss Stuart, what'll we do with Mrs. Clifton ? She and Cliff live alone—lived alone. Could you get a nurse——"

" I'll take her to my place. Father has a resident doctor. I think perhaps I'd better start now. The police would want to question her. It'd be inhuman."

" I think you'd better wait, Miss Stuart. It's—homicide, after all."

" That's absurd. All they could do is badger her out of her wits with questions, and what could she have to tell them about it ? "

" Look—poor little rich girl," Novak snarled, angry, nasty, and scared. " Cliff was killed and I may be killed, too, if the cops don't figure this thing out. I'm not going to handicap them by letting witnesses disappear. You just stay put, will you ? "

" Coward ! " she flared.

The argument was broken up by the arrival of four policemen from a radio car.

Novak said to the one with stripes on his sleeve: " I'm Dr. Michael Novak. I found a man named August Clifton in the washroom, dead. An A.E.C. Security man I know was here, so I put it in his hands. He's upstairs with Clifton now. This is Clifton's wife."

" All right," said the sergeant. " Homicide cars'll be here any minute. Wykoff, you and Martinez keep people from leaving. Don't let 'em use that phone. Sam, come with me." He stumped up the stairs with a patrolman.

It must have been Martinez, small and flat-faced, who asked Novak: " What's going on here, anyway, Doc ? Ain't this the Cheskies' place ? We never have any trouble with the Cheskies."

" It's rented for the night. By the American Society for Space Flight."

" Uh," said Martinez doubtfully. " Borderline cases. Did the guy kill himself ? "

" He did not ! "

" Aw-*right*, Doc ? You don't have to get nasty just because I asked." And Martinez, offended, joined Wykoff at the door. Novak knew he had sounded nasty, and wondered how close he was to hysteria himself.

Anheier came down the stairs slowly, preoccupied. " What's this?" he asked.

" Clifton's wife. I told her. And Miss Stuart. Mr. Anheier from the A.E.C. Security and Intelligence Office."

" Los Angeles regional agent in charge," Anheier said automatically.

" Mr. Anheier," said the girl, " can't I take Mrs. Clifton out of this ? Before the other police and the reporters get here ? "

" I'm not in charge," he said mildly, " but if you ask me it wouldn't be a good idea at all. Best to take our medicine and get it over with. What do you two think of Clifton's emotional stability ? "

" He was brilliant, but——" Amy Stuart began, and then shut her mouth with a snap. " Are you suggesting that he took his own life ? " she asked coldly. " That's quite incredible."

Anheier shrugged. " The sergeant thought so. It's for the coroner to say finally, of course."

" Look," said Novak, laboring to keep his voice reasonable. " You and I know damned well——"

" *Novak*," said Anheier. " Can I talk to you for a minute ? "

Novak stared at him and they went to the foot of the stairs. The Security man said quietly: " I know what you think. You think Clifton was murdered in connection with the—stuff—you told me this afternoon."

" I think there's an espionage angle," Novak said. " And I know you had your mind made up that Clifton and I were cranks. Man, doesn't this change anything ? He's *dead* ! "

Anheier considered. "I'll meet you halfway," he said. "When you tell your story to the cops, keep it straight. Don't babble to reporters about your suspicions. Just leave out your opinion that Clifton was murdered. *If* there's an espionage angle, this is no time to give it to the papers."

" How does that add up to meeting me halfway ? " Novak asked bitterly.

" I want to see you after tonight's fuss is over. I'll fill you in on the big picture. Meanwhile, don't prejudice our position with loose talk. Here's Homicide now. Watch yourself."

Homicide was three sedans full of photographers, detectives, and uniformed police. Reporters and press photographers were at their heels. A Lieutenant Kahn was the big wheel. Novak watched Anheier brief Kahn calmly and competently and felt a charge of resentment. The big picture—what was it ? Perhaps smoothly meshing crews of agents were preparing tonight to seize members of a conspiracy ramified far beyond his small glimpse——

The lieutenant was firing orders. " Nobody, but nobody, leaves the building until I say so. You, yank that press guy out of the phone booth; that line's for us. Sergeant, make an announcement to the movie audience upstairs. Doc, bring Mrs. Clifton to and let her cry it out. I'll want to talk to her later. No reporters past the stairs for now. Where's this Novak ? Come on, let's view the remains."

Now there were two white-faced A.S.F.S.F. kids in the washroom as well as the radio-car sergeant and patrolman. The sergeant saluted and said: "They came in a minute ago, lieutenant. I hold them. Didn't want a stampede."

"Good. Take them down to the lobby with a bull to watch them. Start taking your pictures, Ivy. Let's *go*, you fingerprint men! Where's Kelly? Dr. Novak, you found the body, didn't you? Tell us just what happened while it's still fresh in your mind." A uniformed policeman stood at Novak's elbow with an open stenographic pad.

Don't prejudice our position. Fine words; did they mean anything? Fumblingly, Novak went over it all, from Lilly's first worried request to the end. Halfway through he remembered about the ring, went through his pockets, and produced it. Through it all, Anheier's calm eyes were on him. In deference to the big picture and the unprejudiced position he said nothing about foreign powers, space-ship fuel, or espionage—and wondered if he was a fool.

The scene blended into a slow nightmare that dragged on until 1:00 a.m. Parts of the nightmare were: glaring lights from the Homicide photographers' power packs, Lilly conscious again and hysterical, Amy Stuart yelling at the police to leave her alone, Friml clutching him to ask shakily whether he thought Clifton had been embezzling, sly-eyed reporters hinting about him and Lilly, MacIlheny groaning that this would set back the A.S.F.S.F. ten years and telling his story to the police again and again and again.

Finally there was quiet. The names of A.S.F.S.F. members present had been taken and they had been sent home, kids and engineers. Amy had taken Lilly home. The police had folded their tripods, packed their fingerprint gear and gone. Last of all an ambulance whined away from the door with a canvas bag in its belly.

Left in the lobby of Slovak Sokol Hall were Novak, Anheier, and a stooped janitor grumbling to himself and turning out the building lights.

"You said you wanted to talk to me," Novak said wearily.

Anheier hesitated. "Let's have a drink. I know a bar up the street." Novak, wrung out like a dishrag, followed him from the hall. The waiting janitor pointedly clicked off the last light.

The bar was dim and quiet. Half a dozen moody beersippers were ranged on its stools. Anheier glanced at them and said: "Table okay? I have a reason."

"Sure." The Security man picked one well to the rear.

"Watch the bartender," he said softly.

"Eh?" Novak asked, startled, and got no answer. He watched. The bartender, old and fat, deliberately mopped at his bar. At last he trudged to the end of the bar, lifted the flap, plodded to their table, and said: "Yuh?"

" You got double-shot glasses ? " Anheier asked.

The bartender glared at him. " Yuh."

" I want a double scotch. You got Poland Water ? "

The bartender compressed his mouth and shook his head.

" I want soda with it then. Novak ? "

" Same for me," Novak said.

The bartender turned and plodded back to the bar, limping a little. Novak watched him as he slowly went through the ritual of pouring. " What's all this about ? " he asked.

" Watch him," Anheier said, and laughed. The bartender's head immediately swiveled up and at their table. His glare was frightening. It was murderous.

He brought them their drinks and Novak noticed that his limp had grown more marked. His fingers trembled when he set the tray down and picked up Anheier's bill.

" Keep the change," Anheier said easily, and the bartender's hand tremor grew worse. Wordlessly the man trudged from the table, rang up the sale, and resumed mopping.

" Would you mind telling me——" Novak began, picking up his double-shot glass.

" Don't drink that," Anheier said. " It may be poison."

Novak's heart bounded. This, by God, was it ! Poison, spies, the papers, and Anheier was admitting he'd been right all along !

" Let's get out of here," the Security man said. He got up, leaving his own glass untouched, and they left. Novak's back crawled as he walked out behind Anheier. A thrown stiletto—a bullet——

They made it to the street, alive, and Novak waited to be filled in on the big picture while they walked: he apprehensively and Anheier with icy calm.

" I noticed that old boy come on duty while I was having a beer before the meeting," the Security man said. " He made me think of you. Paranoia. A beautifully developed persecution complex; one of these days he's going to kill somebody."

Novak stopped walking. " He's not a spy ? " he asked stupidly

" No," Anheier said with surprise. " He's a clinical exhibit, and a hell of a man to hire for a bartender. While I was finishing my beer, somebody complained about the weather and he took it as a personal insult. Two lushes were lying about how much money they made. He told them to cut out the roundabout remarks; how much money he made was his business and no cheap jerks could horn in on it. You noticed the limp ? We were picking on him by making him walk to the table. I laughed and he *knew* I was laughing at him. Knew I was one of his enemies plotting against him right under his nose."

" You're telling me that I have a persecution complex, Anheier ? That I'm crazy ? " Novak asked hoarsely.

The Security man said: " Don't put words in my mouth. I am saying you've got a fixed idea about espionage which makes no sense at all to me—and I'm a pro about espionage; you're a grass-green amateur.

" What have you *got* ? A drawing that doesn't look right to you. Why the devil should it ? Mysterious financial backing of the rocket club. All corporate financing is mysterious. The big boys divulge exactly as much as the law forces them to—and a lot of them try to get away with less. Every S.E.C. order issued means somebody tried just that. And Clifton got shot through the head; that's supposed to be the clincher that should convince even me. Do you think suicides don't occur ? "

Automatically they were walking again and the Security man's reasonable, logical voice went on. " I didn't go to that meeting tonight to investigate your allegations; I went for laughs and to see the movie. Novak, it's always tragic to see a person acquiring a fixed idea. They never realise what's happening to them. If you try to set them right, you only succeed in giving them more ' evidence.' You know the job I have. Lord, the people I have to see ! A week doesn't go by without some poor old duffer turning up and asking me to make the A.E.C. stop sending death rays through him. If they get violent we call the city police . . ."

" That sounds like a threat, Anheier."

" It wasn't meant to. But I'm not surprised that you thought it did. Frankly, Novak, have you considered what your record for the past year is like ? I looked you up."

Novak considered, in a cold fury. A transfer—an idiotic transfer. Unsuitable work. Hurlbut's vicious memorandum. The blowup. Affiliating with a bunch of space hounds. Superficially Anheier might look right. Inside himself he knew better.

" It won't wash," he said evenly. " You're not talking me out of anything. There's going to be an inquest on Clifton and I'm going to speak my piece."

" *Better not. And this time it is a threat.*"

It was exhilarating. " So it's out in the open now. Good. You'll do what ? "

" I want very badly to talk you out of your mistaken notion," Anheier said broodingly. " But if I can't, I've got to warn you that you're monkeying with the buzz saw. If the opposition papers get hold of your allegations, there will be hell to pay in the A.E.C. We'll have a spy scare. Security and Intelligence will look bad. Research and Development will look bad because the headlines say another country has beaten us to the punch on rocket fuel. We'll be judged by millions not on the strength of what we do for the nation's security but on what the headlines say we don't do. And all because one Dr. Michael Novak spoke his piece. Novak, do you think we won't counter-punch ?"

Novak snorted. " What could you do ? I happen to be right."

The Security man gave him a pitying look and muttered: " If you smear us, we'll smear you."

Novak suddenly no longer felt exhilarated. It was a frightening word. " That's blackmail," he said angrily, but his knees had gone weak.

" Please don't put it that way." The Security man sounded genuinely pained. " You think you're right and I think you're wrong. If you want to talk to me and give me your side, okay. I'll talk to you and give you my side.

" But if you speak up at the inquest or go to the papers in any other way—we'll have to fight you in the papers. It's your choice of weapons. You can damage A.E.C. terribly with an unfounded spy scare. Naturally we'll hit back. And what can we do except try and impeach your credibility by spreading unfavourable facts about you on the record ? "

In a low, embarrassed voice he went on: " Everybody's done things he's ashamed of. I know I have. I know you have. Boyhood indiscretions—adventures. Girls, traffic summonses. Friends of friends of friends who were Communists. And there were imaginative or inaccurate people who knew you slightly, maybe disliked you, and told our interviewers anything they pleased. We have a deposition in your file from a fellow you beat out on a scholarship exam. He says he saw you cheating in the examination room. Our evaluators disregarded it, but will the headline-readers ? What about your inefficiency at Argonne ? Your fight with Dr. Hurlbut ? "

Novak was feeling ill. " If you people libel me," he said, " I can sue. And I will."

Anheier slowly shook his head. " What with ? " he asked. " Who would hire the man whom the headlines called a lunatic, a pervert, a cheat, a drunkard, a radical, and heaven-knows-what-else ? None of it *proved*, but—' where there's smoke there's fire,' and the ' Indefinable Something behind the Mysterious All This.' " Anheier's voice became strangely compassionate. " I mean it about the buzz saw," he said. " Surely you know of people who fought a smear and wound up in jail for perjury . . ."

He did.

" All right, Anheier," Novak said softly and bitterly. " You've made up my mind for me. I was going to speak my piece at the inquest and get out of town. Now it seems I've got to do your work for you.

" A foreign power's operating under your nose and they've just murdered an American as a minor detail of a plan to bring America to its knees. So I'll keep my mouth shut and stick with the A.S.F.S.F. If I live, I'll blow this thing open. And then God help you, Anheier; I'm going to throw you to the wolves."

He walked unsteadily down a side street away from the Security man. Anheier stared after him, poker-faced.

VIII.

Afternoon of a bureaucrat.

Daniel Holland wished he were in the privacy of his office where he could swallow some soda and burp. He was lunching with the commissioners, four trenchermen, and had taken aboard too much duck with wild rice. And the commissioners were giving him hell, in a nice, extroverted way, for the slow—in fact, almost negligible—progress of A.D.M.P., the Atomic Demolition Material Program. A.D.M.P. was scheduled to provide very shortly atomic explosives that would move mountains in the American Southwest, sculpture watersheds into improved irrigation patterns, and demonstrate to a politically shaky area which elected six senators that the current Administration was the dry-farmer's guide, philosopher, and friend. In actual fact, A.D.M.P. had provided only a vast amount of dubious paper work, and some experimental results which only an insanely optimistic evaluator would describe with even so cautious a word as " promising."

The chairman of the Commission, a paunchy, battered veteran of thirty years in county, state, and national politics, told Holland gently: " Interior's pushing us hard, Dan—very hard. You know he's got the Chief's ear, of course. And it's our opinion that he's not being unreasonable. All he wants is a definite date—give or take a month—that they can start blasting in the Sierras with our stuff. He doesn't care whether the date's a month from now or a year from now, but he needs it for planning and publicity. Of course the work's got to get going before the nominating conventions, but that's absolutely the only restriction on the program. Now, what are we going to tell him?"

" I don't just now offhand, Bill," Holland grumbled. " No doubt about it, A.D.M.P.'s bogged down. I have some suggestions about getting it out of the mud, but they involve basic policy."

The first commissioner was a handsome, muscular man who had gracefully lived down the tag of " wonder boy " pinned on him when he became a university president at the age of thirty-six. He was currently on leave from the executive directorship of a great foundation dedicated to the proposition that visual education is on the beam and all else is dross. He roared jovially at the general manager: " Well, spill your guts, Dan. That's our little old job, you know. Let's canvass your suggestions informally right now. If they click we can programme them for an on-the-record session."

" You asked for it, Cap," Holland said. " First, we need—I mean *need*—about a dozen good men who happen to be teaching or working in industry around the country right now. One's a Yugoslav refugee with relations left in the old country. Another was a Young Communist League member, fairly active, in 1937 and '38. Another was once tried and acquitted on a morals charge—some little girl got mad at him and told lies. Another—well, I won't bother listing them all. You get the idea."

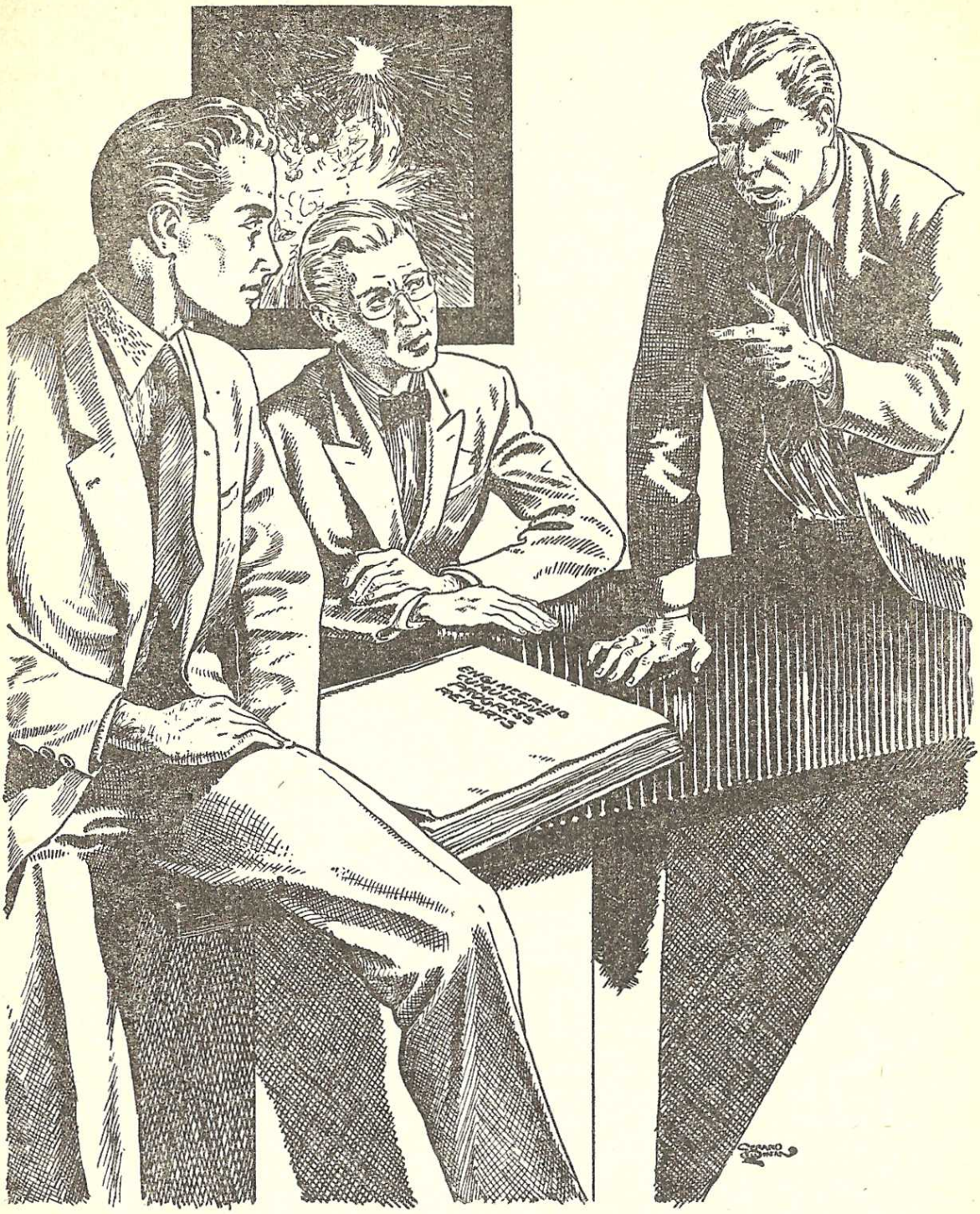
The second commissioner was a spare, white-headed ex-newspaper man: Pullitzer Prize, *Times* Washington Bureau chief, author, diplomatic correspondent, journalism-school dean, intimate of the great, recipient of very many honorary degrees. He shook his head more—to use a cliche that never would have appeared in his copy—in sorrow than in anger. " Now Dan," he said, " this is no time to tinker with the machinery. If there's one thing about A.E.C. that's smooth-running now, it's clearance. Congress is mostly happy—except for Hoyt's gang; the papers are happy—except for the opposition rags; and the public's got confidence in the personnel of their A.E.C. We simply can't start *that* fight all over again. What else did you have in mind ? "

" Second," Holland said impassively, " we're being slowed down by declassification and down-classification. I've drummed into the boys that most material should be merely *Restricted*, *Confidential* covers most of what's left, and the *Secret* classification should be sparingly used. But they're scared, or conservative, or only human, or taking the safest way or whatever you want to blame it on. Every time I give them hell there's a little flurry of *Confidential* and *Restricted* and then the *Secret* begins to mount up again and we're back in the same old rut: boys in Los Alamos doing work that's been done in Hanford and not knowing about it. Maybe because of the limited distribution of *Secret* material. Maybe because the Los Alamos boys aren't in high enough grade for access to it. Gentlemen, I think something basic is required to correct this condition."

The third commissioner was a New York investment banker who had doubled his family fortune in ten legendary years on Wall Street and served his country for the next ten as a diplomatic trouble shooter in the Near East. He was still a formidable welterweight boxer and—to the dismay of the first commissioner—could speak Arabic, Turkish, and Court Persian. Alone on the current Commission, he had thought it his duty to master what he could of nuclear physics and its mathematical tools. Diffidently he said: " That's a tough one, Dan. But I don't see what choice we had or have. Our policy, arrived at in the best interests of the national security, is to ' classify all A.E.C. data to the extent required to prevent it from being of use to potential enemies of the United States.' It's broad, I grant you. But the demands of national security won't be satisfied with anything narrower."

" Neither will Congress," said the second commissioner.

" Neither will the voters," grunted the chairman. " Dan, we'll just have to leave that one in your lap for you to lick as an administrative problem—*within the limits of our policy*. Just a suggestion: what about setting up a special classifications-review unit charged with checking the point-of-origin classifications on new data under a directive to declassify or down classify whenever possible ? You'd be able to keep a single unit here in Washington under your thumb easier than the



assorted managers and directors out in the field. About how much would an outfit like that cost ? "

Embarrassing moment. How to tell them that Weiss had worked on such a plan for three months and found it impracticable ? " Well, Bill, it would stand us maybe two million a year in salaries and overhead. But I see a lot of complications. The personnel in the new unit would have to be scientists or they wouldn't know what they were doing. God knows where we'd get enough of them to keep up with all

the data A.E.C. grinds out—you know the scientific man-power picture. And you'd have a hell of a turnover because scientists like to do science and not paper work. And *quis custodict* ? The safest thing for them to do would still be to stamp everything *Secret*; they'll never get in trouble that way even if it does slow A.E.C. down to a crawl. I'll explore the idea and give you a report, but I think it's a policy matter."

The second commissioner said flatly: " We can't change the classifications policy, Dan. There hasn't been a spy scare worth mentioning in three years. The public's on our side. We've built up a favourable press and congressional attitude slowly and painfully and we're not going to wreck it now. Sure, we'd make a short-term gain if we published all data. But come the appropriations bill debate ! Congress would cut our funds fifty per cent across the board—nail us to the cross to show us who's boss. You've got to do the best you can with what you've got, and never forget the political climate. What else did you have up your sleeve ? "

Holland glanced at the chairman and looked away. Then he said slowly: " Third, something I don't understand at all has come up. A.D.M.P. was set up personnel-wise and equipment-wise to handle one ton of thorium metal a month." The chairman coughed nervously. " I learned yesterday," Holland went on, " that for two months they've been getting only .75 tons a month from Raw Materials. They thought the reduction came from me. I checked with R.M. and found that the office of the chairman ordered a monthly quota of .25 tons of thorium to the Air Force Experimental Station with a priority overriding A.D.M.P. So R.M. quite correctly diverted the A.F.E.S. quota from A.D.M.P.'s quota. I haven't checked so far on what the Air Force has been doing with our thorium." He didn't mention his anger at being by-passed, or his weary disgust at realizing that some fifteen hundred A.D.M.P. personnel had been idle as far as their primary mission was concerned for one sixth of a year because they lacked material to work with.

" Dan," said the chairman slowly, " I owe you an apology on that one. You recall how General McGovern came to bat for us at the last joint Committee hearings. Praised us to the skies for our grand co-operation, said we were all patriots, gentlemen, and scholars he was proud to work with ? Half the Committee members at least are red-hot Air Force fans, so it did us a lot of good. Well, McGovern's price for that was the thorium allotment. His boys at A.F.E.S. think they can use thorium war heads in air-to-air guided missiles. The Weaponeering Advisory Committee tells me it's a lot of nonsense and furthermore A.F.E.S. hasn't got anybody who could do the work even if it were possible, so Air's not really fishing in our lake."

" Can we get their thorium quota back to A.D.M.P.? " Holland asked.

"No. I'd be afraid to try it. McGovern's been talking about a bigger quota, to serve notice on me that he's not going to be whittled down. And I live in fear that the Navy will find out about it and demand a thorium allotment of their own. That's why I was so damned secretive about it—the fewer people know about these deals, the better. Maybe we ought to have Raw Materials set up a new group to expedite thorium-ore procurement and refining—but my point was, no; the Air Force has got it and they won't let go. We've got to get along with the military, Dan. You know that. They can make us look awfully bad if they've a mind to."

"Well," said Holland, "that's that. I'll get you a report you can show Interior by tomorrow morning. Were there any other points for me?"

"Gentlemen?" asked the chairman, looking around the table. There were no other points, and the general manager left them.

The third commissioner said: "I'm a little worried about Holland. He seems to be going cynical on us."

The chairman said: "He's a little stale from overwork. He refuses to take a vacation."

"Like an embezzler," said the ex-banker, and they laughed.

"He doesn't see the big picture," said the second commissioner, and they nodded thoughtfully and got up to go their various ways:

The chairman to weigh the claims of two areas pleading to be the site of the next big A.E.C. plant;

The first commissioner to polish a magazine article on "Some Lessons of Aquinas for the Atomic Age";

The second commissioner to lobby three congressmen in connection with the appropriations bill coming up in eight months;

The third commissioner to confer with the Secretary of State on the line that State's overseas propaganda broadcasts should take concerning A.D.M.P. as proof of America's peace-loving nature.

Holland, in the privacy of his office, took four soda-mint tablets and burped luxuriously. He phoned his assistant Weiss, and passed him the job of drafting tomorrow morning's report for the Secretary of the Interior.

His "While You Were Out" pad said:

"12:15—Senator Hoyt's office called for an appointment 'as soon as possible.' Said I would call back.

"12:20—Mr. Wilson Stuart called from Los Angeles and asked you to call back today 'on the private number.'

"12:45—Senator Hoyt's office called again. Said I would call back.

"12:48—the Associated Press called asking for an interview at your convenience. I said you were occupied for the coming week and referred them to the P. & T.I. Office.

"1:15—Senator Hoyt's office called again. Said I would call back."

He sighed and knocked down an intercom button. " Charlie, tell Hoyt's people he can come right over. Get me Stuart on—no, I'll place it."

" Yes, Mr. Holland."

The general manager didn't have a phone on his desk, but he did have one in a drawer. It had a curiously thickened base, the result of some wire-pulling in A.T. & T. The curiously thickened base housed a " scrambler " of the English type which matched one in Wilson Stuart's bedroom phone. It was a fairly effective measure against wire taps. He pulled out the phone and placed the call.

His old friend must have been waiting by his own phone in the big white Beverly Hills house. " Hello ? " said the voice of Wilson Stuart.

" Hello, Wilson. How is everything ? "

" Let's scramble."

" All right." Holland pushed a button on the phone. " Can you hear me all right ? "

" I hear you." The quality of the transmission had taken an abrupt drop—the result of Wilson Stuart's voice being torn into shreds by his scrambler, hurled in that unintelligible form across the continent, and reassembled by Holland's device. " Dan, things are going sour out here. They're trying to take Western Air away from me—a nice little phony stockholders' revolt. One of my rats in the Oklahoma Oil crowd tipped me today. I don't know how far they've got in lining up their proxies, but it could be bad."

" What's the squawk ? "

" I stand accused of running the board of directors like a railroad—which, God knows, I do, and a good thing for Western. Also, and this is the part that scares me, I'm supposed to be squandering the company's resources."

" Um. It isn't a real rank-and-file thing, is it ? "

" Act your age, Dan ! It's the old Bank of California programme: kick Stuart out of Western Air and integrate it with their other holdings. This time they've met Oklahoma Oil's terms."

" Who's fronting" ?

" That's the only cheerful part. They've got some squirt Air Force two-star general named Reeve. He commands Great Falls A.F.B. in Montana. They've sounded him out and he's supposed to be willing to take over as board chairman after I get the boot. Such patriotism."

" I can do something about that. Know Austin ? "

" I was thinking of him—he'd put the screws on the fly-boy. Will you get in touch with him ? "

" Sure. Fast."

" Another thing . . . I'll be in a lot stronger position for the showdown if I can pull a big, big A.E.C. contract out of my hat. What have you got ? "

Holland thought for a moment. " Well, Reactor Programme's got some big orders coming up. Die-cast one-inch rods, aluminium cans, and some complicated structural members. It might all come to twenty-five million dollars. You set up for die-casting ? "

" Hell no, but what's the difference ? We can subcontract it to anybody who *is* set up. All I want is the money to show those monkeys on the board."

" You'll get it. How's Amy ? "

" No complaints. She brought Clifton's widow home. Too bad about that. You never knew the guy, but he used to work for me—a real character."

" That so ? Tell Amy to drop in and say hello next time she's East. I haven't seen her for months."

" I sure will, Dan. Take care of yourself. *And* the fly-boy. *And* the contract. Good-bye."

Holland hung up and put the phone back in its drawer. He said over his intercom: " Tell Fallon from Reactor Programme Procurement that I want to see him. And get me Undersecretary Austin on the phone—the Air Force Austin."

The Air Force Austin was only an acquaintance, but he had a low boiling point, and handles that stuck out a yard. There were many things that he hated, and one of them was military men who used their service careers as springboards to high-pay civilian jobs.

" Naturally I don't want to meddle in your area, Austin," Holland was telling him a minute later, " but we're all working for the same boss. Can you tell me anything about a Major General Reeves—Great Falls A.F.B.? "

Austin's suspicious New England voice said: " Supposed to be a brilliant young man. I don't know him personally. What about him?"

" I hear he's getting involved in a big-business crowd. If you want me to stop talking and forget about it, just say so."

Austin snapped: " Not at all. I'm glad you called me. What exactly did you hear ? "

" The people are supposed to be Oklahoma Oil and Bank of California. The way the story went, they want to hire him as a front for the reorganization of some aircraft company or other."

" Nothing illegal ? No hint of cumshaw ? "

" None whatsoever. Just the usual big-salary bait."

" Glad of *that*. Thanks, Holland. If Reeves thinks he can use the Air Force, he's got a great deal to learn. I'll have this investigated very thoroughly. If you're right, he'll be A.F. Liaison officer in Guam before he knows what hit him."

Holland grimaced at the thought. It was punishing a man for exercising his freedom of contract; as a lawyer he couldn't be happy about it. Unfortunately, Austin was right too. Industry cheerfully fished the armed-forces and civil-service pond for able and underpaid

executives; it had to be discouraged. Carry the process far enough and industry would hire away the best military and Government brains, leaving the nation—and itself—defended by an army of knuckleheads and administered by a bureaucracy of nincompoops . . .

And of course there were other reasons for lowering the boom on Reeves.

"Mr. Fallon to see you," said his secretary.

"Send him in." Fallon was in his early thirties, but there was something about him that made him look younger to Holland. The general manager thought he could guess what it was. "Is this your first public-service job, Fallon?"

"Yes, Mr. Holland."

"What did you do before this?"

"I was with General Motors. Up in Detroit Purchasing, assistant to the department head."

"That was a good job. Why'd you leave it for us?"

He knew why. The itch you can only scratch with service, the uncomfortable feeling that they needed you, the half-conscious guilt that you owed more than your taxes. He knew why. It had ridden him all his life. Fallon tried to put it into words, and didn't succeed. There were glib hacks who could talk your ear off about it, and there were sincere guys like this who couldn't make themselves a case. "I guess I just thought I'd be happier here, Mr. Holland."

"Well. I wanted to talk to you about the upcoming contracts for breeder cans, moderator rods, and retaining-wall members. Five-nineteen, twenty, and twenty-one, I believe. Are you going to invite Western Aircraft to bid?"

Fallon was puzzled. "I'd swear they haven't got die-casting facilities on that scale, Mr. Holland. I wasn't figuring on it, but of course I'll include them if they can swing it."

"They can handle part of it as prime contractor and subcontract the rest."

"But the procurement policy is——"

"This is a special case. I want you to understand that their bid may seem high, but that they deserve very serious consideration. It's essential that we have no holdup on these castings, and I've practically decided that Western Air can do a better job of seeing them through to delivery than any other outfit that's likely to bid. They're a very able, deadline-minded outfit, and the over-all picture at this time indicates that we need their talent."

Fallon was getting upset. "But we've never had any trouble with Inland Steel or G.E., to name just two fabricators who might bid, Mr. Holland. They come through like clockwork, they know our procedure, we know the people there, they know us—it greases the ways."

"Really, Fallon, I think my suggestion was clear enough. I can't be expected to fill you in on the reasons for it. Some of them are

military secrets, others are policy matters, and none of them is any particular business of yours."

Fallon looked at him, no longer wide-eyed. "Sure," he said woodenly. "How is Mr. Stuart? I hear he's a good friend of yours."

Well, this was it. The cat was clawing at the bag; the beans were about to spill. Coldly Holland channelled the fear that was exploding through him into artificial rage. He was on his feet, and his chair crashed to the floor behind him. In one stride he was towering over Fallon in the deskside chair. Holland thrust his face almost into the face of the man from Purchasing. His voice was a low, intense growl.

"*Watch your language, son.* I've been taking a beating for twenty-eight years in public service." *Talk.* Keep him off balance, make him feel young and raw, make him ashamed, make him unhappy. "They've called me a Communist and a fascist and a bureaucrat and a bungler but they've never called me a crook. My worst enemies admit that if I wanted money I've got the brains to get it honestly. If I wanted money, I could quit A.E.C. today, open a law office tomorrow and have half a million dollars in retainers by next month."

Fallon was beginning to squirm. "I didn't——"

"Shut up. If you think you've turned up evidence of dishonesty, I'll tell you what to do. Pick up your hat and run right over to the Senate Office Building. There's a crowd there that's been trying to nail my hide to the wall ever since you were in knee pants. Maybe you've succeeded where they failed."

"I meant——"

"Shut up, Fallon. You told me what you meant. You meant that I've got nothing to show for twenty-eight years of trying to help run the purest democracy left in the world. That was news to me. I've known for a long time that I wasn't going to get rich out of the Government service. I decided long ago that I couldn't marry, because either the marriage or the work would suffer. I know I haven't got any pride left; I stand ready at any hour of the day or night to get my teeth kicked in by those county-ring Solons up on the Hill. But I thought I had the loyalty of my own kind of people. It seems I was wrong."

"Mr. Holland——"

He didn't interrupt, but the youngster didn't go on. Holland stared him down and then straightened to sit on the edge of his desk. "Go on over to the Senate Office Building, Fallon," he said quietly. "Get your name in the paper. I can stand one more kicking-around and you can use the publicity. Maybe they'll ghostwrite a series of articles for you in the Bennet rags."

But Fallon was almost blubbering. "That's not fair!" he wailed. "I tried to tell you I was sorry. I can't help it if I have an Irish temper and a big mouth. I know what your record is, Mr. Holland. It's a—it's a wonderful record." He pulled himself together and got

up. " Mr. Holland," he said formally and mournfully, " I feel I should submit my resignation."

Holland slugged him on the bicep and said gruffly: " Not accepted. I could use a hundred more like you. I've got a thick hide—usually. Just that crack . . . but don't let it worry you. Clear about that bid?"

" Clear at last, Mr. Holland," Fallon said with a melancholy smile. " I'll try not to make a damned fool of myself again. You have troubles enough."

When he was alone, the general manager set up the kicked-over chair, leaned back, and lit a cigarette with fingers that shook. It had been a very near thing. Lord, how long could a man be expected to keep this up ? The perpetual sweat about wire tappers, loose talkers, shrewd newsmen who might put two and two together, the political opposition relentlessly stalking every hint of irregularity.

Once in T.V.A. he had turned in a friend and classmate for trying to recruit him into a footling little Communist industrial-espionage apparatus. The revelation had been shattering; his duty had seemed clear. But that had been a long time ago . . .

His intercom said: " Senator Hoyt is here, Mr. Holland."

" Send him in, Charlie." He sprang from behind his desk to shake the senator's hand. " Good to see you again, Bob," he burbled cheerfully.

The senator's meaty face broke into an actor's smile. " Mighty nice of you to find time for us, Dan," he said. It was a reminder that he'd had to wait on Holland's convenience to make the appointment and a threat that some day Holland would sweat for it. The senator did not forget slights, real or imaginary.

" How're you, Mary ? " asked Holland, a little dampened.

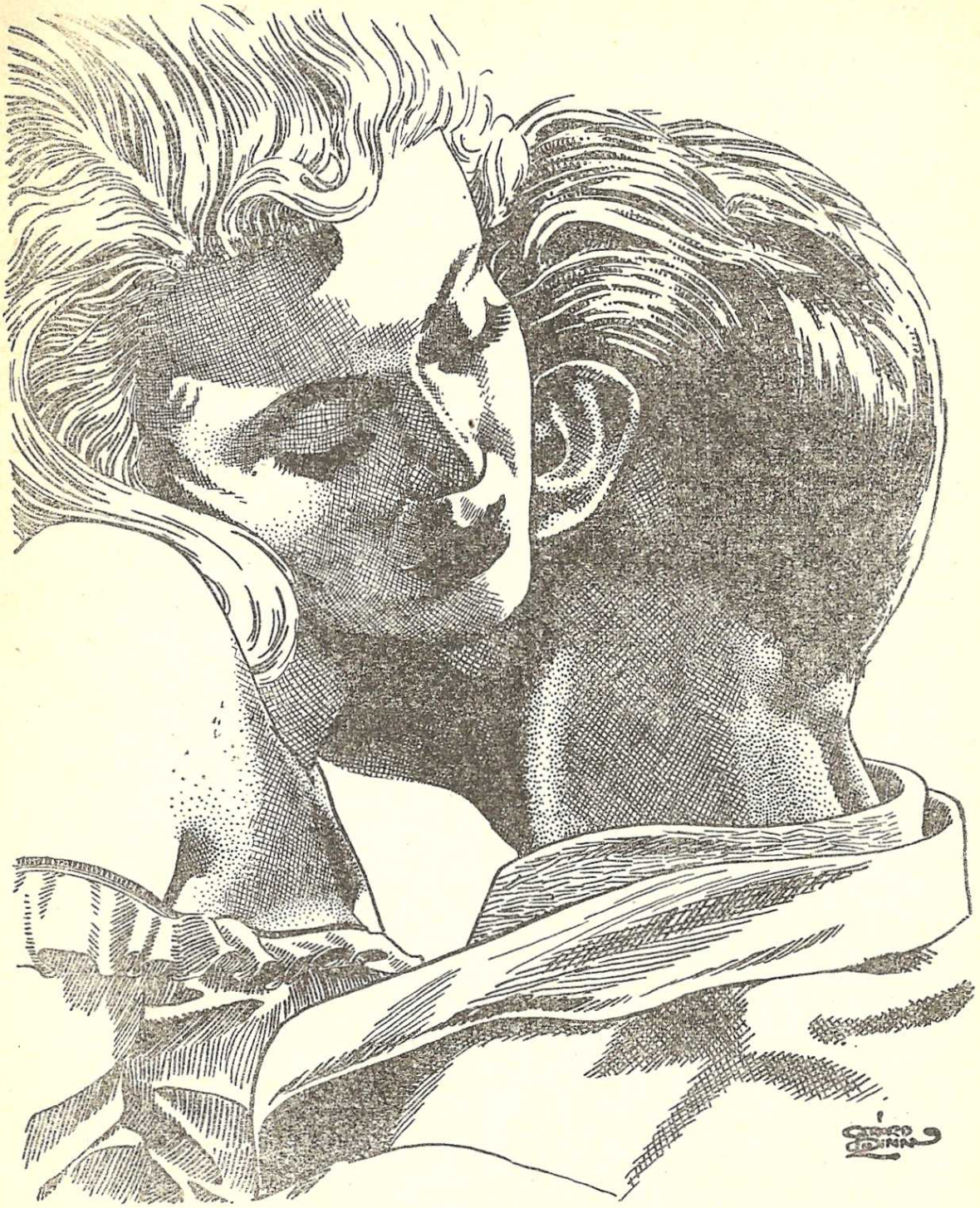
" So—so," Mary Tyrrel, the senator's secretary, said vaguely. It was odd that she was Hoyt's five-thousand-per secretary, because until last year she had been a twenty-thousand-per Washington by-liner for the Bennet newspapers. But lots of odd things happen in Washington.

" Well, Bob, what can I do for you ? "

" I'm collecting a little information, Dan. Normally my investigating staff would handle it. But out of respect for your high position I thought I ought to ask you straight out myself."

Cat and mouse, thought Holland. What's he got ?

The senator lit a cigar deliberately. " I like to consider myself a member of the loyal opposition," he said. " Our democracy has kept its vigour because of constant, intransigeant criticism and pressure by reformers—realistic, practical reformers—against the abuses of an entrenched bureaucracy. I've been in some good scraps, Dan, and I've loved them. I fought the A.E.C. when it tried to give jobs to foreigners of doubtful loyalty. I've fought when you people tried to give moral lepers and degenerates control of our most precious military secrets. I've fought to root out loose-tongued drunkards from the A.E.C."



"It hasn't done you any harm, Bob," Holland said.

The senator wasn't thrown off his stride. "No," he said. "It hasn't. I've enjoyed the rewards of good citizenship. I have the respect of my constituents, and on a national scale I have the backing of a great chain of patriotic newspapers. But Dan, I'm on the track of something that—God willing—will lead to the highest office in the land."

"Dewey didn't make it," Holland said.

The senator waved his cigar expansively. "He got to be governor at least. If he didn't have the imagination to make the jump to the presidency, it was his fault. Of course in his day the techniques weren't as developed as they are now. I know you take the old-fashioned, strict-construction view of politicking: work hard, improve yourself in knowledge and skill, one day you'll get the nomination on a silver platter. With all respect to you as a student of government, Dan, that theory is as dead as the Lincoln-Douglas debates.

"This is an era of high-level energy in science, industry—government. The nervous tensions under which we all live and work rules out leisurely reflection on the claims of this candidate or that. You've got to electrify people. Make them know who you are. Keep dinning your name at them so it drowns out any other candidate's name. Immerse them in your personality. Have it drummed at them twenty-four hours a day, inescapably. The standing machinery of the press and broadcasting will do it for you if you just give them a news peg to hang it on."

The senator—and his secretary—were watching him narrowly.

Holland said: "You figure you've got a news peg?"

The senator tapped cigar ash to the floor. "I might come up with one," he said. "A scandal and an investigation—the biggest ever, Dan. A blowup that will be on every tongue for a solid month. Housewives, factory hands, professional people, children—there'll be something in it for everybody. Dan! What would you think of a public servant who ignored a great discovery instead of promulgating it for the use of the people of the United States? Wouldn't it be—treason?"

"I thought you used to be a lawyer, Bob," Holland said. "It sounds like malfeasance to me."

"What if every indication was that this public servant behaved in no way different from an enemy agent, Dan?"

"Look," said Holland. "If you're going to denounce any of my A.E.C. boys for incompetence or malfeasance or mopery with intent to gawk, go ahead and do it. We've screened and processed our people to the utmost limit of practicability. You're hinting that a spy got through in spite of it. So all I can say is, that's too bad. Tell me who he is and I'll have Security and Intelligence grab him. Is that what you came to see me about?"

"Oh," the senator said mildly, "we just wanted your general reaction to the situation. Thanks for hearing me out so patiently. If anything else turns up I'll let you know."

He smiled and gave Holland a manly handshake. The general manager saw them to the door of his office, closed the door and latched it. He leaned against the oak panels with sweat popping from his brow. Somebody at Hanford had been talking to a Bennet reporter.

They didn't seem to have anything yet on the fiscal or personnel angles

Time was getting very short.

IX.

The story on page four of Novak's morning paper said:

SPACE SHIP ENGINEER
FOUND SHOT TO DEATH
AT ROCKET CLUB MEET

The soaring interplanetary dreams of 146 rocket-club members turned to nightmare at Slovak Sokol Hall last night when the body of engineer August Clifton, trusted employee of the American Society for Space Flight, was found in a washroom of the hall as a meeting of the society was in full swing on the same floor. Assistant medical examiner Harry Morales said death apparently was caused by a head wound from a single .25-calibre bullet. A Belgian automatic of that calibre was found lying near Clifton's right hand, with one shot fired according to Homicide Bureau Lieutenant C. F. Kahn.

The victim's attractive blonde wife Lilly, 35, was taken in a state of collapse to the Beverly Hills home of aircraft manufacturer Wilson Stuart by his daughter Amelia Stuart, a friend of the Cliftons and a member of the rocket club.

The club secretary, Joe Friml, 26, said Clifton had been authorized to spend "sizable" sums of club money in the course of his work, which was to build a pioneer space ship that club members hoped would go to the Moon. Friml said he did not know of any irregularities in Clifton's accounts but added that he will immediately audit club financial records for the past year with an eye to any bearing they may have on the death.

Other friends of Clifton said he was in good health but "moody" and "eccentric."

Lieutenant Kahn said he will not comment until police fingerprint and ballistics experts have analyzed the evidence. An inquest will be held Wednesday morning.

The body was discovered by Dr. Michael Novak, 30, an engineer also employed by the club, when he slipped out of the meeting room during the showing of a film. Novak immediately called in the aid of A.E.C. security agent J. W. Anheier, who was attending the meeting as a visitor. Anheier stood guard in the washroom to prevent evidence from being disturbed until police arrived. He later told reporters: "There is no security angle involved. It was just a coincidence that I happened to be there and Dr. Novak called on me."

Two one-column photographs flanked the story. One was of Amy Stuart, very society-page looking, captioned: "Socialite shelters stricken wife." The other was a view of the *Prototype*: "Dead engineer's unfinished 'moon rocket.'"

All tied up in a neat little package with a bow, Novak thought bitterly. Without saying it, the newspaper told you that Clifton had blown his brains out, probably after imbezzling A.S.F.S.F. money.

If you didn't know Clifton, you'd believe it of course. Why not? "They wouldn't print it if it wasn't true."

He went from the lobby newsstand to the hotel coffee shop and ordered more breakfast than he thought he could eat. But he was a detective now; he'd have to act unconcerned and unsuspicious while he was slowly gathering evidence——

Oh, what the hell.

It wasn't real. None of it had been real, for months. Assignment to Neutron Path Prediction, when he didn't know whether neutrons should take paths or four-lane super-highways. Slugging his boss, quitting his job under a cloud—research and development men didn't *act* like that. Going to work for the A.S.F.S.F., an organization as screw-ball as Clifton himself.

He wanted to laugh incredulously at the whole fable, finish his coffee, get up and walk into the job he should be holding at N.E.P.A.: a tidy salary, a tidy lab, and tidy prospects for advancement. But the climax had eclipsed even the lunacy of the past months. Somehow he had talked himself into pretending he was a detective. Detectives were hard-eyed, snap-brimmed, trench-coated, heroic. On all counts he fell down badly, Novak thought.

But a man was dead, and he thought he knew why.

And he had been threatened cold-bloodedly with a smear backed up by all A.E.C.'s prestige, and perhaps with a perjury frame-up, if he tried to get help. Novak looked helplessly at his scrambled eggs, gulped his coffee, and got up to call on the A.S.F.S.F. business office. There was a disagreeable, uncontrollable quiver in his knees.

Friml and MacIlheny were there. It was incredible that they might be spies or killers—until he remembered the bewildered, ashamed, ordinary faces of spies on the front pages of tabloid newspapers.

"Hello, Dr. Novak," the president of the A.S.F.S.F. said. "Friml and I were discussing the possibility of you taking over Clifton's job as engineer in charge."

There was no time to stop and think of what it might mean. Friml and MacIlheny might be innocent. Or they might be guilty but not suspicious of him. There was no time. He forced surprise: "Me? Oh, I don't think so; I'll be busy enough on my own. And I don't think I could handle it anyway."

"I see you had some years of aeronautical engineering."

"Well, yes—undergraduate stuff. Still, Clifton did say there wasn't a lot of work left."

"He did that much for us," MacIlheny said bitterly. "The damned fool."

"Mr. MacIlheny!" said Friml, with every appearance of outrage.

"*Yes*, Mr. Friml," said the insurance man sardonically. "*De mortuis nil nisi bonum*, as you B.B.A.s and C.P.A.s put it. If he was so nuts

he had to kill himself why didn't he resign first? And if he didn't have time to resign, *why* did he have to do it at a meeting? Everything happens to the poor old A.S.F.S.F. Clifton's death is going to set us back ten years in getting public recognition. And our industrial sponsors——" MacIlheny buried his head in his hands.

"I never thought he was a very stable person——" Friml began smugly.

"Oh, shut up!" MacIlheny snarled. "Just stick to your knitting. If I want your learned opinion I'll ask for it."

Novak was appalled at the naked enmity that had flared between the two men. Or the pretence of enmity? Nothing would hold still long enough to be examined. You had to keep talking, pretending. "Could I see," he asked conciliatingly, "just where we stand with respect to structural work on *Proto*?"

"Show him the cumulatives, Friml," said the president, not looking up. With his lips compressed, Friml pulled a folder from the files and handed it to Novak. It was lettered: "Engineering Cumulative Progress Reports."

Novak sat down and forced himself to concentrate on the drawings and text. After a few minutes he no longer had to force it. The papers told what was to a technical man the greatest story in the world: research and development; cool, accurate, thoughtful; bucking the cussedness of inanimate nature, bucking the inertia of industrial firms; bucking the conservatism, ignorance, and stupidity of hired hands—and getting things done. It was the story of *Prototype's* building told by the man who could tell it best, Clifton.

It started about one year ago. "Contacted Mr. Laughlin of the American Bridge Company. I don't think he believed a word I said until Friml took out the A.S.F.S.F. passbook and showed him our balance. After that, smooth sailing."

Sketches and text showed how the American Bridge Company, under Clifton's anxious, jealous eyes, executed ten-year old A.S.F.S.F. blue prints for the skeleton of *Prototype*. The tower of steel girders rose in the desert to six times the height of a man, guyed down against the wind. There was a twelve-foot skeleton tetrahedron, base down, for its foot. From the apex of the tetrahedron rose the king post, a specially fabricated compound member exactly analogous to the backbone of a vertebrate animal. It bore the main stresses of *Proto's* dead weight; it was calculated to bear the strains of *Proto* in motion; and it was hollow: through its insulated core would run the cables of *Proto's* control systems. Structural members radiated laterally from the king post to carry the weight of *Proto's* skin, and from its top sprouted girders over which the nose would be built.

Reports from Detroit: "I been going the rounds for a solid week and still no dice. If a plant's got the forming presses, its toolroom stinks. If its toolroom is okay, the superintendent won't let me barge

in to stand over their die-makers and tell them what to do. But that's the way it's going to be; those hull plates are too tricky to order on an inspect-or-reject basis."

Later: " I found a good little outfit named Allen Body Company that does custom-built jobs. They got one Swedish-built forming press 40 x 40 (very good), a great toolroom with a wonderful old kraut named Eichenberg heading it up who's willing to work closely with me, and a good reputation in the trade. Told them to submit bid to Friml fast and suggest he fires back certified check without haggling. These guys are real craftsmen."

Later: " Oskar and me finished the forming and trimming dies for first tier of plates today. Twenty-four tiers of plates to go, plus actually stamping and machining them. I guess ninety days tops."

Eighty-five days later: " Mr. Gowan of the Union Pacific says he'll have a sealable freight car at the Allen siding tomorrow, but that it's out of the question for me to ride aboard with the plates. That's what he thinks. I bought my folding cot, Sterno stove and beans already."

Sketches showed what " the plates " were like: mirror-finished steel boxes, formed and machined to exact curvature. The basic size was 36″ x 36″ x 6″, with some larger or smaller to fit. The outer, convex wall of the box was of threequarter-inch steel; the inner, concave wall was one-inch armour plate. Each box was open along one of its narrow 6″ x 36″ faces, and each was stuffed with compressed steel wool—the best shock absorber A.S.F.S.F. brains had devised to slow down and stop a pebble-sized meteorite if one should punch through the outer shell. There were six hundred and twenty-five of the plates, each numbered and wrapped in cotton wool like the jewel it was.

Three days later Clifton arrived aboard his freight car in the Barstow yards. When a twenty-four-hour guard of A.S.F.S.F. volunteers was mounted over the freight car, he located a trucking company that specialized in fine furniture removals. " Not a scratch and not a hitch. We got them stacked in order under the tarps at the field. I think it will be okay to use some volunteers on the welding. I checked with the Structural Ironworkers, the Shipbuilders, and the Regional C.I.O. people. It seems nobody has union jurisdiction on building space ships, so Regional said we could use unpaid helpers so long as they don't touch the welding torches while they're hot. Tomorrow I go down to the shipyards to get myself the six best damn master welders on the Coast. I figure on letting them practice two—three days at beadless welding on scrap before I let them start tacking *Proto's* hide on. Meanwhile I rent a gantry crane. It'll make a better platform for the welders than scaffolding and cut down your chance of spoilage. Also we'll need one later when we come to installing heavy equipment."

He got his master welders and his gantry crane. Two of the welders grinned behind their hands, refusing to follow his rigid specifications on the practice work; he fired them and got two more. The fired

welders put in a beef with the union and the others had to down their torches. Clifton lost a day. "I went down to the hall and gave the pie cards hell. I brought some of the junk those two bums did and I threw it on their desks and they said they'd kill the beef and let them know if there's any more trouble, which I don't think there will be with the new boys."

There wasn't. The first tier of plates went on, and fitted to a thousandth of an inch. Volunteer kids working at the field were horrified to see the latticework skeleton of the *Prototype* sag under their weight, and Clifton told them it was all provided for down to the last hairsbreadth of sag.

As the shining skin of *Proto* rose from the ground in yard-high tiers, the designers of the A.S.F.S.F. passed through the acid test and came out pure gold. Nameless aero-engineers, some long gone from the Society and some still with it, engineering professors and students at U.C.L.A., Cal Tech and Stanford, girl volunteers punching calculators in batteries, had done their job. The great equation balanced. Strength of materials, form of members, distributed stresses and strains, elasticities and compressibilities added and equaled one complete hull: a shiningly perfect bomb shape that could take escape velocity. Six plates equally spaced around the eleventh tier and one plate in the eighth tier were not welded in. The six were to be fitted with deadlights and the one with a manhole.

The welders crawled through the eighth-tier hole for their last job: two bulkheads which would cut the ship into three sections. The first cut off *Proto's* nose at the ninth tier. It was the floor of her combined living quarters and control room—a cramped, pointed dome some ten feet in diameter and twelve feet high at the peak. From this floor protruded the top of the king post, like a sawed-off tree stump sprouting girders that supported the nose. The second bulkhead cut *Proto* at the seventh tier. It made a cylindrical compartment aft of the control room that could store five hundred cubic feet of food, water, and oxygen. This compartment also doubled as the airlock. The outside manhole would open into it, and from it a second manhole would open into the control room above.

Aft of the bulkhead was two-thirds of the ship—an empty shell except for structural members radiating from the king post. It was reserved territory: reserved for a power plant. The stiff paper rattled in Novak's hands for a moment before he could manage them. He had almost been lost in cool, adult satisfaction, as he followed the great engineering story, when fear struck through. This triumph—whose? MacIlheny and Friml glanced briefly at him, and he sank into the reports again.

"Sorry to say . . . repeated twelve times . . . seems conclusive . . . obviously a bonehead play . . . some of the new silicones may . . . deadlight gaskets . . ." Novak's heart beat slower and calmer,

and the words began to arrange themselves into sense. Clifton's report on the six planned deadlights was negative. Vacuum-chamber tests of the proposed gasketing system showed that air leakage would be prohibitive. There simply wasn't a good enough glass-to-metal seal. The ring of deadlights was *out*, but a single deadlight in the nose was indispensable. Air leakage from the nose deadlight was cut to an almost bearable minimum by redesigning the assembly with great, ungainly silicone gaskets.

This meant blind uncertainty for any theoretical occupants of *Proto* during a theoretical ascent. The nose deadlight, an eighteen-inch optical flat at the very tip of the craft, was to be covered during the ascent by an " aero-dynamic nose " of sheet metal. In space the false nose would be jettisoned by a power charge.

The next series of reports showed Clifton in his glory—control devices, his speciality.

In one month, working sometimes within A.S.F.S.F. specifications and quite often cheerfully overstepping them, he installed: an electric generator, manhole motors, lighting and heating systems, oxygen control, aerodynamic nose jettison, jato igniters, jato jettison, throat vane servos (manual), throat vane servos (automatic, regulated by a battery of fluid-damped plumb bobs). Controls for these systems were sunk into the head of the king post that jutted from the control-room floor. There was nothing resembling a driver's seat with a console of instruments and controls.

And there were two other control systems indicated in the drawings. At the imput end they had provisions for continuous variation of voltage from zero to six, the power plant's maximum. At the output end there was—nothing. The two systems came to dead ends in *Proto's* backbone, one at the third tier and one at the fifth.

Novak had a short struggle with himself. Play dumb, or ask about it ? They say they think you're smart enough to take over . . . He asked.

" Fuel-metering systems," MacIlheny said. " We assumed of course that something of the sort would be needed eventually, so we had Clifton put in dead-end circuits."

" I see."

He was nearing the end of the sheets. The last report said acceleration-couch tests were proceeding satisfactorily with no modifications yet indicated. And then the folder came to an end.

" I think," Novak said slowly, " that I can handle it after all. He's just about finished the job—as far as any private outfit can take it."

MacIlheny looked up and said evenly: " There's some more construction work to be done—on the same basis as the dead-end control systems. Naturally there's got to be a fuel tank, so we're going to put one in. Here's the drawings——" He had them ready in a blueprint file.

It was another of the " J. MacI " jobs, with the same date as the too-specific drawings for the throat liner and chamber. Novak wondered crazily whether MacIlheny or Friml had a gun in his pocket, whether the wrong reaction meant he'd be shot down on the spot. He studied the sheet and decided on his role. The " fuel tank " was a fantastic thing. It filled almost the rear two-thirds of the Prototype and made no sense whatever.

There was one section forward that consisted of stainless steel. A section aft, much smaller, was quartz-lined lead, with a concrete jacket. Atomic. There was a lead wall indicated between the stainless-steel tank and the *Proto's* aft bulkhead. Atomic. This was a tank for a fuel that burned with atomic fire.

He told them, businesslike: " It's going to cost a hell of a lot of money but that's your business. I can install it. Just don't blame me if it has to be ripped out again when A.E.C. comes out with an atomic fuel that doesn't fit it."

MacIlheny said into the air, slowly and with burning emphasis: " *Can't* people understand that *Proto's* not a moon ship ? Can't they get it through their heads that she's just a dummy to study construction problems ? What the hell difference does it make if the fuel A.E.C. comes up with doesn't fit her system ? All we're after is the experience we'll need to build a system that does fit."

Novak said hastily: " Of course you're right." Lord, but MacIlheny was convincing ! " But it gets a grip on you. Half the kids think it's a moon ship——"

" All right for kids," said MacIlheny grimly. " But we're all adults here. I'm sick of being ribbed for doing something I'm not doing at all. Good—and—sick." He stared at the engineer challengingly, and then his grimness vanished as he added: " I wish it *was* a moon ship, Novak. I wish it very much. But——" He shrugged.

" Well," said Novak uncertainly, " maybe I'll feel that way about it after a year or so of the ribbing. By the way, can you tell me where Miss Stuart lives ? I ought to go and see Mrs. Clifton if I can be spared today, and I suppose things are still in a state of flux."

" Thirty-seven twenty-four Rochedale," said Friml, and he jotted it down.

" I suppose it's all right," said MacIlheny. " God, what a headache. Just when things were going smoothly. Suppose you check in tomorrow morning and we may have some plans made for you."

" Won't the membership have to——"

" The membership," said MacIlheny impatiently, " will do as it's told."

X.

Novak thought he should phone the Wilson Stuart residence before he tried to pay a call. He couldn't find the number in the book and

naively asked Information. Information sharply told him that the number was unlisted.

Well, he tried.

He got a downtown cab and enjoyed a long ride into the rolling country lying north of Los Angeles. "Pretty classy," he said.

"*I* should know?" asked the cabby blandly, and added in a mutter something that sounded like: "Stinking rich."

A mile farther on, the cab stopped. "Check point," the driver said. Novak saw a roadside booth, all chrome and glass, with two cops in beautifully fitting uniforms. One of them came out to the car, the driver gave him the address, and they rolled on.

"What was that about?" Novak asked.

"A trifling violation of our civil liberties," the cabby said. "Nothing to get upset about. At night, now, they take your name, and phone on ahead if they don't know you."

"California!"

"All over," the cabby corrected him. "Grosse Pointe, Mobile, Sun Valley—all over. I guess this is it."

Thirty-seven twenty-four Rochedale was extreme California modern: a great white albatross of a house that spread its wings over a hilltop.

"Well, go on up the driveway," Novak said.

"Nope. If you had any business with folks like that you'd have your own limousine. *You* go in and get arrested for trespassing. These people don't fool around." He turned down the meter flag and Novak paid him.

"I hope you're wrong," the engineer said, adding a half dollar. He started up the driveway.

It was a confusing house. He couldn't seem to find a place where it began, or a doorbell to ring. Before he knew it, he seemed to be inside the Stuart home, unannounced, after walking through a row of pylons into a patio—or was it a living room? They didn't build like that in Brooklyn or Urbana.

A shock-haired old man rolled into the living room—or patio—in a wheel chair pushed by a burly, Irish-looking fellow in a chauffeur's dark uniform. "I'm sorry," Novak exploded jumpily. "I couldn't find——"

"Who the devil are you?" demanded the old man, and the chauffeur took his hands from the chair, standing exactly like a boxer about to put up his fists.

"My name's Novak. I'm a friend of Mrs. Clifton's. I understand she's here—if this is the Wilson Stuart residence."

"I'm Wilson Stuart. Do you know my daughter?"

"We've met."

"I suppose that means she didn't invite you. Did she give you the address?"

" No—she's a member of the A.S.F.S.F., the space-flight society. I got it from the secretary."

The old man swore. " Keep it to yourself. A person has no damned privacy in one of these places and I can't build a wall because of the zoning laws or covenants or whatever they are. Grady, get Miss Amelia." The chaffeur gave Novak a no-funny-business look and left.

" Uh, how is Mrs. Clifton ? " Novak asked.

" *I* don't know; I haven't seen her. I'm not surprised by any of this, though. I thought Clifton's mind was giving way when he took that job with the rocket cranks. Not that I'd keep him on my pay roll. He told my V.P. for Engineering that he didn't know enough to build an outhouse on wheels. That tore it." The old man chuckled. " He could really ram things through, though. Didn't give a damn whose floor space he muscled in on, whose men he gave orders to, whose material he swiped for his own projects. Where are they going to find another lunatic like that to build their rocket ? "

" I'm taking it over, Mr. Stuart." What a callous old beast he was !

" You are ? Well, be sure you have nothing to lose, Novak. What are they paying you ? "

" Rather not say."

It made Wilson Stuart angry. " Well, isn't that too bad ! I can tell you one thing. Whatever it is, you're putting a blot on your record that no responsible firm can afford to ignore." He spun the chair to present his back to Novak and scowled through the pylons that formed one wall of the ambiguous room.

Novak was startled by the burst of rage, and resentful. But you didn't tell off a cardiac patient at will—or a multi-millionaire.

The chaffeur and Amy Stuart came in. " Hello, Dr. Novak," she said. The old man silently beckoned over his shoulder to the chaffeur and was wheeled out.

" How's Mrs. Clifton ? " Novak asked.

" Father's doctor says she should rest for a day or two. He's given her some sedatives. After that—I don't know. She's talking about going back to her family in Denmark."

" May I see her ? "

" I think so. Dr. Morris didn't say anything about it, but it should do her good. Come this way."

Crossing large, glass-walled rooms he said: " I don't think I should have come at all. Your father was upset by my knowing the address. Mr. Friml gave it to me."

" Mr. Friml should have known better," she said coolly. " My father has no reserves of energy for anything beyond his business and necessary recreation. It's cruel discipline for him . . . he's held speed and altitude records, you know."

Novak uttered a respectful mumble.

The girl asked: " What are they going to do about a replacement for Cliff ? "

" I think I get the job. I've done some aero-engineering and there's very little structural work left to be done. I suppose if there's anything I simply can't handle, they'll hire a consultant. But I can probably swing the load."

" You can if you're checked out by MacIlheny. The man's a——" She started to say " fanatic " and then interrupted herself. " That's the wrong word. I admire him, really. He's like—not Columbus. Prince Henry the Navigator of Portugal. Henry stuck close to his desk and never went to sea, but he raised the money and did the paperwork."

" Um. Yes. Has Lilly—Mrs. Clifton—been asking for a biomathematicist, I wonder ? She has such faith in them that it might do her good at a time like this, when it's a matter of psychological strain."

The girl looked startled. " That's very odd," she said. " As a matter of fact she hasn't. I suppose recreations like that show up in their true light when the pressure is on. Not that it would do her any good to ask for one. Dr. Morris would break the neck of any biomathematicist who showed up here."

She pushed open a flush door of blonde wood and Novak saw Clifton's widow in the middle of a great modern bed with sickroom paraphernalia on a side table. " Visitor, Lilly," Amy Stuart said.

" Hallo, Mike. It was good of you to come. Amy, you mind if I speak alone vit' Mike ? "

" Not at all."

" Sit down," she said with an unhappy smile as the girl closed the door. " Mike, what's gonna happen now ? You don' think Cliff kill himself, do you ? " She was fighting back tears with a heartbreaking effort. " He act cra-a-azy. But that was just because he enjoy life and didn't give a damn for nobody. He wasn't no crazy man to kill himself, was he, Mike ? "

" No, Lilly," Novak said. " I don't think he killed himself." And he bit his lip for saying it. The woman was under sedation, she might babble anything to anybody——"

" Mike," she said, " I'm glad you say so." She sniffed and dried her brimming eyes, as a child would do, on the hem of her bed sheet.

" How're you fixed for money, Lilly ? " he asked. " I thought you might need a little ready cash for—expenses and things."

" T'anks, Mike, no need. We had a yoint bank account vit' couple t'ousand dollars in. Mike, honestly you don't believe Cliff kill himself ? "

He thought it over. " Have you taken any medicine ? "

" Last night the doc gave me couple pink pills and he tol' me to take couple more today—but I don't. You know I don't t'ink much of doctors."

" I don't want to tell you what I think about Cliff's death if you're full of medicine or if you're going to be. You might talk to somebody about what I tell you. It might mean my life too." It was her business, he told himself silently.

After a stupefied pause, Lilly slowly asked: " Please tell me all about it, Mike. Who'd kill Cliff ? Who'd kill you ? Those few crazy kids in the Society, they don' like Cliff ever, but they wouldn't kill him. You tell me what it's all about, Mike. Even if somebody tear the eyes out of my head I don' talk."

He pulled his chair to the bedside and lowered his voice. "Yesterday Cliff and I thought we found something fishy about one of the A.S.F. S.F. blue prints. I thought it meant that a foreign country was using the Society to build it a rocket ship. Maybe with Friml or MacIlheny or both fronting, and nobody else in on it. We went to the A.E.C. Security office downtown and saw that man Anheier. He brushed us off—didn't believe a word of it. Last night Cliff got killed and it looked like suicide. But it could have been murder by anybody who could have sneaked into the washroom when he was there—and that's anybody off the street and practically anybody who was at the meeting.

" I don't know how—whoever did it—got wise to his visit to Security or why nobody's taken a shot at me that I know of. Maybe spies keep a twenty-four-hour watch on the Security office to see who visits it. Maybe Cliff's visit was the signal for his death. Maybe I wasn't identified because I'm new in town.

" But none of that matters right now. What matters is that Anheier wouldn't let me tell the police about my idea. He tried to convince me that I was a paranoid. When that didn't work, he threatened to ruin me for life and jail me for perjury if I talk, now or ever."

" You not gonna tell the po-lice, Mike ? "

" No, I'm afraid of the smear and—it probably wouldn't do any good. The A.E.C. would make countercharges and any foreign agents would escape in the fuss. I told Anheier the hell with him, I'd nail them alone."

" No," she said, pale-faced. " Not alone, Mike. Vit' me."

" Thanks, Lilly," he said softly, and she was crying at last.

" Don' mind me," she said. " T'anks for coming to see me and now you please go. I cry better by myself . . ."

He left in silence. She was with him—it felt better. The morning with MacIlheny and Friml, every question a step on a tightrope over the abyss, had told on him.

Amy Stuart laid down a magazine and got up from a blocky chair. " How is she, Dr. Novak ? "

" I'm afraid I made her cry."

" It's good for a woman to cry at a time like this. Have you a car ?"

" No; I came in a taxi. If I could phone for one——"

" You're downtown, aren't you ? I'll drive you; I have some shopping."

Her car was a two-seater English sports job. It looked like a toy in the garage between the big Lincoln and a suburban wagon.

As they went winding through the scrubbed-clean roads he broke the silence. " To me it's just an interesting job, you know. I'm not a Prince Henry like MacIlheny is and maybe Cliff was. Or—what was her name ? The girl who raised sand at the meeting. The one you stepped on."

" Gingrich ? " Amy Stuart said dispassionately. " She's not particularly interested in space flight and she's a bloody fool besides. If Gingrich and her friends had their way, there'd be a full-dress membership vote by secret ballot on where to put each rivet in the *Prototype*."

The little two-seater rolled past the police sentry box and Amy Stuart waved pleasantly to the two policemen. They saluted with broad smiles and Novak abandoned himself to bitter thoughts for a moment.

" Jeffersonians, they think they are," the girl brooded. " But wouldn't Jefferson be the first man to admit that things have changed since his day ? That there's a need for something beyond sheer self-regulating agrarian democracy ? " The question was put with an intensity that startled him. It was overlaid with a portentous air that made him think of nothing so much as a doctor's oral where, literally, your career is made or unmade by a few score words spoken in a minute or two. What was the girl driving at.

" People are always accusing engineers of not thinking about social problems," he said carefully. " In my case, I'm afraid they're right. I've been a busy man for a long time. But I wonder—are you by any chance flirting with fascism or Communism ? "

" No," she said scornfully, and fell silent.

It was some minutes before she spoke again. " You were in A.E.C. Did you ever read anything by Daniel Holland ? He's a friend of father's. And mine."

There was something he could talk about. " I didn't know he wrote, but your friend runs a hell of a silly organization. You know what my field is. Believe me or not, but I swear I was transferred out of it and into a highly specialized branch of mathematical physics. I was absolutely helpless, I was absolutely unable to get back to my own work. Finally I—I had to resign."

She said patiently: " That's exactly the sort of thing Holland fights. In his books he analyzed the warped growth of modern public administration under the influence of the Jeffersonian and Jacksonian mistrust of professionals. He calls it the ' cincinnatus complex.' "

He recognized the allusion and felt pleased about it. Cincinnatus was the Roman citizen who left his plowing to lead the army to victory and then returned to his plow, turning down glory and rewards. " Interesting concept," he said. " What does he suggest ? "

The girl frowned. " If you'd thought about it, you'd know that's damn-all he could suggest. His books were only analytical and exploratory, and he nearly got booted out of public service for daring to raise the problem—challenging the whole structure of bureaucracy. He thought he could do more good in than out, so he stopped publishing. But he'd stepped on some toes. In *Red Tape Empires* he cited a case from the Nevada civil service. The Senator from Nevada on the joint A.E.C. Committee badgered him from then on. Wonderful irony. He was a master of all the parliamentary tricks that were originally supposed to carry out the majority will without infringing on minority rights."

He was worried about Lilly and getting shot and future long, precarious talks with MacIlheny. " I suppose," he said absently, "you're bound to have a rotten apple in every barrel."

Amy Stuart said flatly but emphatically, with her eyes on the road: " You scientists deserve exactly what you got." And she said nothing more until she dropped him off at his hotel and proceeded to her shopping. Novak had a queasy, unreal feeling that he'd just failed his doctor's oral.

XI.

The high-temperature lab was built, and its equipment installed by the able construction firm that had done the field layout. During this time Novak worked on the manhole problem, and licked it. Studebaker *had* ungreased its titanic boring mill and for a price had cheerfully put a super finish on the manhole and its seating. In an agony of nervousness for the two priceless chunks of metal, Novak had clocked their slow progress by freight car across the country from South Bend to Barstow.

It was one of those moments when Lilly Clifton or Amy Stuart was helpfully by his side, and this time it happened to be Amy. They stood outside the machine-shop prefab, squinting into the glare of the *Prototype's* steel skin, and at an intenser, bluer glare that was being juggled by a hooded welder on the gantry-crane platform, twenty feet up. The manhole cover and seating assembly were being beadlessly welded into the gap in the ninth tier of plates. It was a moment of emotional importance. *Proto* externally was an unbroken whole.

Novak's pulse pounded at the thought, while the matter-of-fact welder up there drew his hell-hot point of flame like an artist's brush along the gleaming metal. The engineer couldn't be matter-of-fact about it any more. He had plunged into the top-boss job at the Barstow field determined to give a realistic imitation of a space hound, and had become one.

There was no reason not to. In theory, he told himself, he was waiting for a break but one never came. There were no further

irregularities beyond the four on which he had committed himself: money, secrecy, the " J. MacI." drawings, and the death of Clifton.

MacIlheny never offered any surprises. He was an insurance man and a space-flight crank. He had cloudy industrial contributors in his pocket and he used them as a club to run the Society his way. His way was to get *Proto* built as a symbol and rallying point for those who demanded a frontal smash by the Government into the space-flight problem instead of the rudimentary, unco-ordinated, and unimaginative efforts that were all the United States could show, for whatever reason.

Friml continued to be—Friml. Bloodless, righteous, dollar-honest, hired-hand, party-of-the-second-partish Friml. A reader of the fine print, a dweller in the Y.M.C.A., a martyr to constipation, a wearer of small-figured neckties which he tied in small, hard knots.

The engineer members of the A.S.F.S.F. continued to be hobbyists, hard to tell one from the other, showing up on week-ends, often with the wife and kid, for an hour or so of good shoptalk and connoisseurs' appreciation of *Proto* as the big, handsome jigsaw puzzle that she was —to them.

The A.S.F.S.F. youngsters continued to be hagridden kids escaping from humdrum jobs, unhappy families, or simply the private hell of adolescence by actually helping to pay for and work on and dream over *Proto*. Some day it would carry them on wings of flame to adventurous stars where they'd be all broad-shouldered males six feet tall or slim but luscious girls with naturally curly hair. They worked like dogs for the new engineer in charge and didn't even ask for a dog's pat on the head; all they wanted was to be near enough to *Proto* to dream. They fought ferociously with words on occasion over this detail or that, and Novak eventually realized that their quarrels symbolized a fiercer squabble they hoped was coming over the passenger list of man's first moon ship.

Novak stood comfortably midway between the engineers and the kids—he hoped. *Proto* was big medicine. The dream of flight which has filled the night lives of countless neurotics since, probably, the Eolithic era, had been no dream since the balloons of Montgolfier. This new wish fulfillment of space flight had been for fifty years standard equipment on your brilliant but dreamy youngster. It soaked into you from earliest childhood that some day—not quite in your time, but some day—man would reach the planets and then the stars. Being around *Proto*, putting your hands on her, tinkering with her equipment, smelling her hot metal in the desert sun, hearing her plates sing as they contracted in the desert-night chill, did something to you, and to the " some day " reservation about space flight. Novak had become a true believer, and with each passing week wondered more feverishly what in hell's name he was doing: building a moon ship for China ? Running up dummy ? Or just honest engineering ?

Each week he told himself more feverishly: one week more; just get the manhole licked, or the silicone gaskets, or the boron carbides.

The blue, hard twinkle of the welding torch twenty feet up snapped off; the welder shoved back his hood and waved genially. The platform of the gantry crane descended.

" That does it," Novak said hazily to Amy. He lit a cigarette. "You want to push the button ? "

" If it doesn't work, don't blame me," she said. There was a six-volt line run from the machine shop into *Proto's* sewerpipe stern and up through the king post to feed the electric systems. She snapped the control for the manhole motor to open, and they stared up again. The dark disk against the shiny steel plate developed a mirror-bright streak of microfinish bearing surface along one edge. Noiselessly and very slowly the wire-fine streak grew to a new moon; the manhole slowly stood out in profile and halted, a grotesque ear protruding from the ship.

" Okay, Amy. Close it." She snapped the switch to *Shut*, and very slowly the disk swung back and made *Proto* an unbroken whole again. The welder stepped from the gantry platform and asked: "She all right, Mr. Novak ? "

" Fine, Sam. Fine. Was there any trouble fitting the lug into the receptacle ? "

" Nope. Only one way to do it, so I did it. It surely is a fine piece of machinery. I used to work at the Bullard Works in Hartford and they didn't make their custom-built machine tools any prettier than your—thing. Confidentially, Mr. Novak, is——"

He held up his hand protestingly. " It's a full-scale mock-up for structural study and publicity purposes. Does that answer the question, Sam ? "

The welder grinned. " You people are really going to try it, aren't you ? Just don't count on me for a passenger is all I ask. It's pretty, but it won't work."

As they walked to Novak's refractory lab, Amy said: " I worry about everything Cliff installed, like the manhole motor, until it's tested. I know that verdict, ' while of unsound mind ' and so on is just legal mumbo jumbo, but . . . why should the manhole have opened that slowly ? It was like a movie, milking it for suspense."

He glanced at her. " Perfectly good reasons. It runs on a worm gear—low speed, power to spare. The motor has to open it against the molecular cohesion of the biggest gauge-block seal ever machined. In space or on the Moon the motor would get an assist from atmospheric pressure in the storeroom, pushing against zero pressure outside."

She laughed. " Of course. I suppose I was being jittery. And there's sometimes melodramatic suspense in real life, too, I suppose."

He cleared his throat. " I've got Lilly in there aging a new boron-carbide series. Want to watch ? You can learn enough in a few hours to take some routine off my neck. The volunteer kids are fine and dandy, but they mostly have jobs and school hours. What I need is a few more people like you and Lilly that don't have to watch the clock."

" It must be very handy," she agreed abstractedly. " But you'll have to excuse me. I'm due back in town."

Novak stared after her, wondering what was biting the girl. And he went on into his lab.

It was the dream layout he had sketched not too long ago, turned real by the funds of the A.S.F.S.F. Lilly was in the cooling department clocking temperature drops on six crucibles that contained boron carbides in various proportions. She was looking flushed and happy as she sidled down the bench on which the crucibles were ranged, jotting down the time from the lab clock and temperatures from the thermocouple pyrometers plugged into each sample. Her blonde hair was loose on her creamy neck and shoulders; she wore shorts and a blouse that were appropriate to the heat of the refractories lab but intensely distracting. She turned and smiled, and Novak was distracted to the point of wondering whether she was wearing a brassière. He rather doubted it.

" What are the temperatures now ? " he asked.

She read off efficiently: " Seventy-two, seventy-four, seventy-eight, seventy eight point five, seventy:eight point five, seventy-nine."

The leveling was unexpected good news. " Interesting. Are you afraid to handle hot stuff ? "

" Naw ! " she said with a grin. " Yust not vit' my bare hands."

" Okay; we'll let you use tongs. I want you to take the lid off each crucible as I indicate. I'll slap the ingot in the hydraulic press, crush it, and give you the dial reading. Then I'll put it in the furnace. After all the ingots are crushed and in the furnace I'll turn on the heat and watch through the peephole. When they melt I'll call out the number to you, and you note the temperature from the furnace thermocouple. Got it ? "

" I t'ink so, Mike."

It went smoothly. The ingots were transferred safely, they crushed under satisfactorily high pressure, and the furnace flashed red and then white in less than five minutes. Staring through the blue glass peephole at the six piles of glowing dust, waiting for them to shimmer, coalesce, and run into liquid, was hypnotically soothing—except that he could sense Lilly at his side, with her eyes on the thermocouple pyrometer and her full hips near him, giving him thoughts that he found alarming.

He stared at the cones of glowing dust and thought bitterly: *I don't want to get any more mixed up in this than I am now.* One of the glowing

piles shimmered and looked mirrorlike. Abruptly it shrank from a heap of dust into a cluster of little globes like an ornamental pile of Civil War cannon balls and an instant later slumped into a puddle.

" Number five ! " he snapped.

" Got it, Mike," she said, and her thigh touched him.

This thing's been coming on for a couple of weeks. I'll be damned if I don't think she's giving me the business. She ought to be ashamed. But what a shape on her. Amy wouldn't pull a stunt like this. He felt a little regretful and hastily clamped down on *that* train of thought.

" Number three ! "

" Got it."

Minutes later he was at his desk with the figures, and she was an interested spectator. He explained laboriously: " The trick is to reduce your unknowns to a manageable number. We have mixing point of the original solution, rate of cooling, final temperature, and melting point. You call them T_1, dT/dt—that's derivative of temperature with respect to time—T_2 and T_3. Do you follow it so far ? "

The leaned over his shoulder and began: " I don' see——"

" The hell with it," he said, and kissed her. She responded electrically, and in her candid way indicated that she meant business. The

faint voice of Novak's conscience became inaudible at that point, and the business might have been transacted then and there if the lab door hadn't opened.

Hastily she pulled away from him. " You go see what is, Mike," she ordered breathlessly.

" Fine thing," he growled, and slapped her almost viciously on the rump.

" I know how you feel, boy," she grinned.

" Oh—no—you—don't." He cleared his throat and stalked out from the small private office into the lab. One of the machine-shop kids was waiting. The boy wanted to know whether he should use hot-roll or cold-roll steel for the threaded studs of the acceleration couches; the drawings just said " mild steel." Novak said restrainedly that he didn't think it made any difference, and stood waiting for him to leave.

When he got back to the private office Lilly was putting her face on. She said hastily: " No, Mike. Keep the hands off me for a minute while I tell you. This is no place. You wanna come to my house tonight, we do this t'ing right."

" I'll be there," he said a little thoughtfully. Conscience was making a very slight comeback. He hadn't been to the Clifton house since the day of the murder. But the lady was willing, the husband was six feet under, and it concerned nobody else.

" Good boy. You go back to work now."

He watched her drive from the field in the big maroon Rolls and tried to buckle down. He got nothing done for the rest of the afternoon. He tried first to set up matrix equations to relate the characteristics of the six boron carbides and committed howler after howler. He decided he'd better lay off the math until he was feeling more placid. In the machine shop he took over from an uncertain volunteer who was having trouble threading the acceleration-couch studs. Novak, with a single twitch of the lathe's cross-feed wheel, made scrap out of the job.

It wasn't his day. Among the condolences of the machine-shop gang he declared work over and bummed a ride back to Los Angeles in one of the kids' jalopies.

He bolted a meal in the hotel dining room and went upstairs to shower and shave. Not until he was dressed and down in the lobby did he realize that he didn't remember the Clifton address—if he had ever heard it. Cahunga, Cahuenga Canyon, something like that, and he could probably find the house from a taxi window. He went to the phone book to look up Clifton, and found nothing under August. There were three A. Cliftons with middle initials, but none of them lived on anything that sounded like Cahunga, Cahuenga, or whatever it was. He tried Information and got the standard Los Angeles answer—unlisted number. A girl waiting outside the half-opened door

of the phone booth turned red and walked away after overhearing part of his comments on that.

Now what the devil did you do? He recalled suddenly that Friml was good on addresses, just the way you'd expect his card-file type to be. He looked up the Downtown Y.M.C.A. and was connected with Friml's room.

"This is Novak, Friml. I hate to bother you after hours, but I wonder if you can give me Clifton's address. I, um, need it for some reports and he isn't in the phone book."

The secretary-treasurer's precise voice said: "Just one moment, Mr. Novak. I have it in a memorandum book. Please hold the line."

Novak held on for some time and then Friml gave him the address and—unsolicited—the phone number. He jotted them down and said: "Thanks. Sorry to be such a nuisance."

Friml said with a martyred air: "Not at all. I'm not good at remembering numbers myself." There was a plain implication of: "So why the hell don't you keep a memorandum book like good little me?"

Mildly surprised at the admission, Novak thanked him again and hung up. Now for a taxi. Walking up the street to a stand where he could climb in without having to tip a doorman, he wondered how he'd got the notion that Friml kept his address book in his head. Probably just the type of guy he was made you think so. Probably he did nothing to discourage you from thinking so. Probably there was a lot of bluff behind any of these ice-water types . . .

And then he stopped still in the street, realizing what had made him think Friml was a walking address book. He'd asked once for the Wilson Stuart address, and the secretary-treasurer had rolled it out absently as if it were no great feat to recall offhand where a rank-and-filer of the Society lived. He started walking again, slower and slower.

There was something very wrong. Friml had memorized the Wilson Stuart address, presumably of negligible importance to him. All he could possibly have to do with the Wilson Stuart address was to send a bill for annual dues, meeting notices, the club bulletin—no not even that. All those items were addressographed. Friml had not memorized the August Clifton address or phone number, although presumably he'd be constantly dropping notes and making calls to him for engineering data. If he didn't know the Clifton number and address offhand he was decidedly no good at numbers, as he admitted.

Novak walked slowly past the cab rank and crossed the street. Stepping up to the curb, his right heel caught in the unfamiliar sag of his trouser cuff, and he thought: damn that belt.

It was, clearly, the first break in the Clifton killing. Friml wasn't what he seemed to be. Clearly there was a link of some sort between the secretary-treasurer and Amelia Earheart Stuart—or her father. Now how did you exploit a thing like this? Raid Friml's Y.M.C.A.

room looking for the Papers? Tell that fathead Anheier about it and have him laugh in your face? Confront Wilson Stuart with it and have him conk out with a heart attack—or throw you in jail for trespassing? Try to bluff the facts out of Amy?

Friml has even visited the Clifton bungalow—*feller who broke the big mirror and my Svedish glass pitcher and your cat'ode-ray tube. That was Friml, Mike. He gets pretty bad.* It had been a gag—maybe. Nothing strange about a Friml swilling his liquor like a pig and breaking things now and then. And talking . . .

He raised his arm for a passing taxi.

"Downtown Y.M.C.A.," he told the driver.

XII.

He called up from the lobby. "Friml? Novak again. I'm downstairs. I'm at a loose end and I wonder whether you'd care to join me for a drink or two some place. Maybe we can have a general bull session about the Society. I've been working like a dog and I need some unstringing."

The voice said grudgingly: "Well . . . come on up, Dr. Novak. I had some work for this evening, but . . ."

Friml had a two-room suite, medium-sized and antiseptically clean. He seemed proud of his place. He showed Novak his desk: "Some people tell you it's a sign of inefficiency to take your work home with you. I don't believe that for a minute. You, for instance—I can tell that you don't leave your job behind when you leave the field."

"I don't think any really conscientious person would," Novak agreed with gravity, and Friml glowed dimly at the implied compliment.

"You're right about—unstringing," said the secretary-treasurer. "I'm not a *drinker*, of course. I'll be with you in a minute." He went into the bathroom and Novak heard the lock turn.

He stood undecided over the desk and then, feeling that it was a childish thing to do, tried its drawers. They opened. In the shallow centre drawer where pencils, rulers, paper clips, and blotters are kept, Friml kept pencils, rulers, paper clips, and blotters. In the top left drawer were letterheads, carbon paper, second sheets, and onionskin in a rack. In the second left-hand drawer were card-file boxes and a corduroy-bound ledger with red leather corners and spine. In the bottom drawer were books with brown wrapping-paper covers on them, the kind school children use on text books.

Friml appeared, looking almost cheerful. "There's a quiet little place on Figueroa Street," he said. "The pianist does request numbers. He's pretty good."

"Fine," said the engineer, depressed.

The place on Figueroa Street wasn't a fairy joint, as Novak had half expected it would be. They sat at a table and had a couple of

drinks apiece while the pianist played blues. Novak knew vaguely that it was a big blues-revival year. The engineer made conversation about his membership report for the next meeting. " I don't know just what the members expect, because Clifton spoke off the cuff and there aren't any transcripts."

Friml said relaxedly: " Just give 'em the high spots. About fifteen minutes. And don't go by what Clifton did. Some times he used to just get up and joke. Other times he used to be 'way over their heads with math and electronics."

" That sounds like him. I was wondering about visual aids. Do you think I ought to have some easel cards made up ? I think the whole trouble is, I don't know whether the membership report is just a formality or whether they really pay attention. If it's just a noise I'm supposed to make so everybody will feel he's getting his money's worth from the Ph.D., then I won't bother with the cards. If they really listen and learn, I ought to have them."

" You ought to just suit yourself, Novak," Friml said rather expansively. " They like you and that's the main thing. How'd you like *my* job, with everybody calling you a son of a bitch ? " He took a

deep swallow from his drink. He was having blended rye and ginger ale, the drink of a man who doesn't like to taste his liquor.

Novak excused himself and went to the phone booth. He called Lilly Clifton.

" Mike ? " she asked. " Ain't you gonna come 'round tonight like you said ? "

" Later, I think," he told her. " Listen, Lilly. I think I've found out something about the death of—of your husband." It was an awkward thing to say.

" So ? Tell me." Her voice was unexpectedly grim.

It didn't sound like much in the telling, but she was impressed.

" You got somet'ing," she said. " See if you can bring him around here later. I t'ink he goes for me."

He told her about Friml's memory. She said dryly: " I see. I guess maybe he was a liddle bit queer for Cliff. It drived him nuts the time he was out here, the way Cliff played around vit' me affectionate. Every time Cliff gimme a kiss or somet'ing, Friml took a bigger drink. I guess I was flatt'ring myself. You bring him anyway if you can."

He said he'd try, and went back to the table. Friml was a drink ahead of him by then, and said : " No more for me, Mike," when Novak tried to order. He sounded as though he could be talked into it. The pianist, a little black man at a little black piano on a platform behind the bar, was playing a slow, rippling vamp between numbers. " Coffee Blues ! " Friml yelled unexpectedly at him, and Novak started.

The vamp rippled into a dragging blues, and Friml listened bleakly with his chin propped in his hand. He signaled their waiter after a few bars and drank his shot of blended rye without mixing or chasing it. " Great number," he said. " *I like my coffee—sweet, black, and hot . . . I like my coffee—sweet, black and, hot . . . won't let no body fool . . . with my coffee pot* . . . I always liked that number, Mike. You like it ? "

" Sure. Great number."

Friml beamed. " *Some folks like—their coffee tan and strong* . . . You ever know any coloured girls, Mike ? "

" There were a few from Chicago in my classes at Urbana."

" Good-looking ? " Friml wouldn't meet his eye; he was turning over in his hands the pack of matches from the table ash tray.

" Some of them yes, some of them no."

Friml gulped his drink. " Could I borrow a cigarette ? " he asked. Novak tapped one out of his pack and held the match for the accountant. Friml got his cigarette wet, but didn't cough. From behind a cloud of smoke he asked: " Did any of the white fellows at the university go around with the coloured girls ? "

" Maybe some in Liberal Arts College. None that I remember in Engineering."

"I bet," Frim said broodingly, "I bet a fellow could really let himself go with a colored girl. But if a fellow's trying to build up a good solid record and get some place it wouldn't look good if it got out, would it?"

Novak let him have it. "It wouldn't make much difference if a fellow was just fooling away his time on one bush-league job after another."

Friml quivered and stubbed out his cigarette, bursting the paper. "I really ought to be getting out of here," he said. "One more and then let's beat it, okay?"

"Okay." He signaled and told the waiter: "Double shots." And inquiringly to Friml: "All right, isn't it?"

The secretary-treasurer nodded glumly. "Guess so. 'scuse me." He got to his feet and headed for the men's room. He was weaving. Novak thoughtfully poured his own double shot into Friml's ginger ale.

A sad little man, he thought, who didn't have any fun. Maybe a sad little man who had slunk out of the auditorium of Slovak Sokol Hall during the movie and put a bullet through Clifton's head for an obscure reason that had to do with the Stuarts.

Friml came drifting back across the floor and plopped into his chair. "Don't do this often," he said clearly and gulped his double shot, chasing it with the ginger ale. He put a half dollar on the table with a click and said: "Let's go. Been a very pleasant evening. I like that piano man."

The cool night air did it. He sagged foolishly against Novak and a cruising taxi instantly drew up. The engineer loaded him into it. "You can't go to the Y in this shape," he said. "How about some coffee some place? I have an invitation to Mrs. Clifton's. You can get some coffee there and take a nap."

Friml nodded vaguely and then his head slumped on his chest. Novak gave the cabby the Clifton address and rolled down the windows to let a breeze through.

Friml muttered during the ride, but nothing intelligible.

Novak and the cabby got Friml to the small front porch of the Clifton bungalow, and Novak and Lilly got him inside and onto a couch. The engineer noticed uncomfortably that she was wearing the strapless, almost topless, black dinner dress she'd had on the night Cliff died. He wondered, with a faint and surprising touch of anger, if she thought it would excite him because of that. The bungalow inside had been cleared of its crazy welter of junk, and proved to be ordinary without it. One lingering touch: on spread newspapers stood a sketch box and an easel with a half-finished oil portrait of Lilly, full face and somber with green.

She caught his glance. "I make that. Somet'ing to do." She looked down at Friml and asked cheerfully: "How you feeling, boy? You want a drink?"

Incredibly, he sat up and blinked. "Yeah," he said. "Hell with the job."

"The yob will keep," she said, and poured him two fingers from a tall bottle of cognac that stood on a coffee table. He tossed it down in one gulp.

"Don't do this often," he said sardonically. "Not good for the c'reer. The ol' man wouldn't like it."

Wilson Stuart. It had to be. Fighting a tremor in his voice, Novak said: "It's a shame to see a trained man like you tied up with a crackpot outfit like the Society."

"That so?" asked Friml belligerently. "'m doing a better job than anybody thinks. And they all call me a son of a bitch for it. So do you. But *I'm* the guy that sees he gets dollar for dollar. I mean dollar's value for a dollar spent." Friml looked cunning. "I got a c'reer, all right. You may not think so, but I'm gonna be com'troller of a certain big aircraft company one of these days. Not at liberty to tell you which. How's *that* for a c'reer? I'm only twenny-six, but I'm *steady*. 'at's what counts." He fell back on the couch, his eyes still open and glassy, with a little smile on his lips. "Where's 'at drink?" he muttered.

Lilly poured another and put it by his hand. "Here y'are, feller," she said. He didn't move or change expression. She jerked her head at Novak and he followed her to the bedroom.

"What you t'ink?" she asked in a whisper.

"Wilson Stuart and Western Air," he said flatly. "They are the famous 'industrial backers.' Friml is Stuart's man in the A.S.F.S.F. to watch Stuart's money. Stuart gives orders to MacIlheny and Friml's right there to see that they get carried out."

She raised her eyebrows. "Old Stuart don't hire such punks, Mike. Cliff told me."

"He seems to have been hired right out of his graduating class for the sake of secrecy," Novak said. "And he must look like a fireball on paper. Straight A's, no doubt. He's a screwed-up kid, but the pressure has to be right before you realize it." He told her about "Coffee Blues." "Maybe he should be factored by a biomat'ematicist," he said, straight-faced.

She flicked him on the jaw with her fingertips. "Don' tease me," she said crossly. "I'm t'rough vit' them. All they want is you' money. You so smart, tell me what old Stuart wants vit' a moon ship and where he got atomic fuel for it."

"There's no answer," he said. "It's got to be a government working through him. What countries does he sell big orders to? What small countries with atomic energy programmes and dense populations? I guess that narrows the field down a little. And it makes the thing harder than ever to swallow. Wilson Stuart of Western Air a foreign agent." He thought of what Anheier would say to that, and

almost laughed. The thing was now completely beyond the realm of credibility. And it was in their laps.

They went silently back into the living room. The brandy glass was empty again and Friml's eyes were closed at last. He was completely out.

"Mike," she said, "I guess you better leave him here."

"But what about——"

"You a sveet boy, but some other time. This yerk depresses me."

She gave him a cool good-night kiss, and he hiked down the road to a shopping street and taxi stand.

Novak saw, with a pang, that Lilly was not on the field. He asked casually around whether she had phoned or left word with anybody. She hadn't. After last night's fiasco with the drunken secretary-treasurer, he supposed, she felt shy . . .

Amy Stuart was there, reporting for assignment, and he savored the mild irony of the situation. Her father, board chairman of Western Air, was funneling money into the A.S.F.S.F. and dictating its policies. And his daughter was reporting for assignment to a hired hand of the Stuart funds. He toyed for a moment with the notion of assigning

her to make the lunch sandwiches and dismissed it as silly. She had training and keen intelligence that he needed for *Proto*, whatever *Proto's* destiny was to be.

" Help me in the refractories lab ? " he asked.

She said a little woodenly: " I thought that was Lilly's job."

" She didn't show up today. You're not afraid of hot stuff, are you ? "

" Hot-radioactive or hot-centigrade ? "

He laughed with an effort. She was very boldly playing dumb. " Hot-centigrade. Two thousand degrees of it and up. Tongs, gauntlets, masks, and aprons are furnished. But some people get trembly anyway and drop things."

" I won't," she said. " Not if Lilly didn't."

He taught her routine for an hour and then set her to compounding six more boron carbides by rote. " Call me if there's any doubt at all about a procedure," he said. " And I hope you have a conscience. If you make a mistake, start all over again. A cover-up of a mistake at this stage would introduce a hidden variable in my paper work and wreck everything I'm doing from now on."

" You don't have to impress me with a wild exaggeration like that, Mike. I know my way around a chemistry lab."

The arrogance of the amateur was suddenly too much for him. " *Get out*," he said. " Right now. I'll get by somehow without you."

She stared at him, openmouthed, and her face became very red. And she left without a word.

Novak strode to the compounding area. His hands deftly did their work with the great precision balance while his mind raged at her insolent assurance. He was letting the beam of the balance down onto the agate knife-edge fulcrum for the sixteenth time when she spoke behind him: " Mike."

His hand, slowly turning a knurled bronze knob, did not twitch. " Minute," he growled, and continued to turn the knob until he felt the contact and the long pointer began to oscillate on the scale. He turned and asked her: " What is it ? "

" What the devil do you think it is ? " she flared. " I'm sorry I got you sore and in the future I'll keep my mouth shut. Is that satisfactory ? "

He studied her indignant face. " Do you still think I was trying to impress you with a wild exaggeration ? "

She set her mouth grimly and was silent for a long moment. Then she stubbornly said: " Yes."

Novak sighed. " Come with me," he said, and took her into the small private office. He pulled out yesterday's work sheets and asked: " Know any maths ? "

" Up to differential calculus," she said cautiously.

That was a little better than he expected. If she could follow him

all the way it would be better for her work—far better than her taking him on faith.

In a concentrated one-hour session he told her about the method of least squares and how it would predictably cut his research time in half, about matrix equations and how they would pin down the properties of the boron carbides, about n-dimensional geometry and how it would help him build a theory of boron carbides, about the virtues of convergent series and the vices of divergent series, and about the way sloppy work at this stage would riddle the theory end of it with divergent series.

" Also," he concluded, " you made me mad as hell."

Laughter broke suddenly through her solemn absorption. " I'm convinced," she said. " Will you trust me to carry on ? "

" With all my heart," he grinned. " Call me when the batches are ready for solution."

Cheerfully he tackled yesterday's data and speedily set up the equations that had defied him yesterday.

Amy Stuart called him and he guided her through the rest of the programme on the six new carbides. She was a neat, fast worker who inked her notes in engineer's lettering. She wasn't jittery about

handling " hot-centigrade " material. A spy? A handy one to have around. Lilly didn't have her cool sureness of touch.

They worked through the morning, finishing the batch, had sandwiches, and ran another batch in the afternoon. She left at five with the machine-shop gang and Novak put a third batch through himself. He wrote his weekly cumulative report during the four hours it sat aging. The report included a request for Friml to reserve sufficient time with I.B.M.'s EBIC in New York to integrate 132 partial differential equations, sample enclosed, and to post bond on their estimate at $100 per hour, the commercial rate. With this out of the way he ran tests on the third batch and phoned Barstow for a cab. The gate guard's farewell was awed. Night hitches were unusual.

Novak had dinner in the desert town while waiting for the Los Angeles bus. He asked at his hotel's desk whether there had been any calls. There had been no calls. Phone her? No, by God ! He wanted to be alone tonight and think through his math.

In ten days of dawn-to-dusk labour, he had his 132 partial differential equations. The acceleration couches got finished and installed. He ordered the enigmatic " fuel tanks " and left the fabrication to the vendor, a big Buena Vista machine shop. He was no aero-engineer; all he felt competent to do was give them the drawings and specify that the tanks must arrive sufficiently disassembled to pass through *Proto's* open end for final assembly in place.

Amy Stuart continued to be his right bower; Lilly did not reappear at the field. She phoned him once and he phoned her. Astonishingly, they were on a we-must-get-together-some-time-basis. He asked about Friml and Lilly said vaguely: " He's not such a bad kid, Mike. I t'ink you don't do him justice." Novak wondered fleetingly whether Friml was wearing a belt or suspenders these days, and realized that he didn't care a great deal. Amy Stuart asked after Lilly regularly, and he never had anything to tell her.

On a Friday afternoon he zipped a leather brief case around twenty-two ledger sheets on which were lettered in Amy's best engineer style the 132 equations that EBIC would chew into.

" Drive me to town ? " he said to her. " I'd like to get to the office before they close up."

" With—the Papers," she said melodramatically, and they laughed. It came to him with a faint shock that it should be no laughing matter, but for the moment he couldn't persuade himself that there was anything sinister about this pretty girl with the sure, cool hands. The shared research, a common drain on them in progress and a mutual triumph at its end, was too big a thing to be spoiled by suspicion—for the moment. But depression stole over him on the desert road to Los Angeles, as he rode by Amy's side in the little English sportster.

She dropped him in front of the run-down building at 4.30.

He hadn't seen Friml since the secretary-treasurer's brannigan had broken up his plans for an evening. Without a blush, Friml laced into him. He seemed to be trying out a new manner for size: bullying instead of nagging; Friml the Perfect Master instead of Friml the Perfect Servant. " I'm *very* glad to see you again, Dr. Novak. I've tried several times to advise you that you should report regularly, at least once a week, in person, or by telephone if unavoidable."

Nuts. Let him have his fun. " Been pretty busy." He tossed the brief case on Friml's desk. " This is the stuff to send I.B.M. When's our reservation ? "

" That's just what I wanted to see you about. Your request—it was fantastic. Who—*who*—is this Mr. Ebic whom you wish to call in as a consultant at *one hundred dollars an hour* ? " His voice was a sort of low, horrified shriek.

Novak stared at him in amazement. " Didn't you check to see what it was if you had doubts ? "

" Certainly not. It's insane on the face of it. Just what do you think you're up to ? "

To be continued

From : TAKEOFF

Science fiction books appear to fall neatly into three categories, before any consideration of quality of appearance or content. Mostly the reviewer is faced with a novel which has been reprinted from a magazine serial or is an expanded magazine short novel. On the reasonable assumption that the publisher has resurrected a worthwhile story, one looks forward to the second reading with enjoyable anticipation, and the first book on this month's list is no disappointment. *Fahrenheit* 451 by Ray Bradbury (Rupert Hart-Davis, 9/6), appeared originally in a shorter version as " The Fireman " in *Galaxy Science Fiction*, achieving the controversial distinction habitual with this brilliant iconoclastic author. Here he is occupied with a favourite theme—a society in which books are forbidden—and while the brittle beauty of Bradbury's prose is not to everyone's taste this powerful study of the conflicting emotions in Montag, the fireman whose job it is not to put out fires but to burn the banned books, is an unforgettable experience. The title, by the way, refers to the temperature at which book-paper is supposed to ignite, and this English edition economises on such inflammable material by leaving out the two novelettes, " And the Rock Cried Out " and " Playground " which padded out the American hard-cover edition.

Mr. Bradbury's first novel appears at a time when he is paying a fleeting visit to London, albeit on his way from Northern Ireland to Sicily where he will spend a short vacation with his family. His European trip is a working one—he has been writing the script for a new version of the film " Moby Dick." More important to fantasy readers, however, is the rumour that Mr. Bradbury may shortly script his own *Martian Chronicles* for a film. This magazine hopes to bring you further news on this and the fabulous Bradbury in the very near future.

Another reprint novel is Eric Frank Russell's *Sentinels from Space* (Museum Press, 9/6), which is good sound science-fiction of the fast-action, interplanetary warfare type, suitably complicated with a super-human hero and heroine pitting themselves against other mutant opposition. In complete and refreshing contrast, Judith Merril's *Shadow on the Hearth*, although published last year (Sidgwick & Jackson, 9/6),

must be mentioned if only for its present topicality. But, in addition, this novel about the impact of atom-bomb warfare on one American family is recommended for its sincerity of style and conviction of characterisation.

In the second category, the spate of anthologies continues undiminished (although surely the knell of these prolific collections must soon be sounded as the bottom of the thirty-year barrel is scraped clean, and frustrated anthologisers vie for the current year's crop—whether good, bad or indifferent). Here the many pearls are gleaned from the magazine field. If occasionally a few spurious pieces of jewellery slip by the craftman's eyepiece just remember that sparsely-filled barrel and get your value from the really first-class stories that deserve revival. So to pass from bad mixed metaphors to good mixed science fiction, *Invaders of Earth* edited by Groff Conklin (Weidenfeld & Nicolson, 10/6), shows the hand of an expert who has made his reputation by anthologies. The extra-terrestrial invasion theme is well-built around such worthy foundations as Van Vogt's " Not Only Dead Men " and Murray Leinster's " This Star Shall Be Free," and includes Howard Koch's " Invasion from Mars," a radio script which pannicked America when broadcast by Orson Welles in 1938.

Mr. Conklin also contributes *Strange Travels in Science Fiction* (Grayson & Grayson, 9/6), a just but unwieldy title presenting the first selection of stories from the original USA volume " Omnibus of Science-Fiction." Included among the pleasant variety of its thirteen stories are Bradbury's " Kaleidoscope " and Tony Boucher's memorable " Star Dummy," and even two old-timers, " Colour Out of Space" by the late H. P. Lovecraft, and Jack London's " The Scarlet Plague." My sympathies lie with the unfortunate whose task it is to find substitute titles for the aptly-named " Omnibus," and if it is not too late may I suggest " A Streetcar Named S-F " for the second volume ? He could not conceivably do worse. With the condensed version of Martin Greenberg's " Five Science Fiction Novels," the easy way out is taken and *Crucible of Power* (Bodley Head, 8/6), takes its title from Jack Williamson's novelette of Earthmen's intrigues among the reptilian descendents of the ancient Martian civilisation. The other two short novels making up this volume are Norman L. Knight's " Crisis in Utopia," and the equally undistinguished dime-novel thriller—unaccountably from the pages of the old, revered *Unknown Worlds*—Norvell W. Page's " But Without Horns " concerning an evil, power-mad mutant whose plan to enthrall America is nearly thwarted by the determined hero. The surprise ending redeems this one.

Not all anthologies are reprints, and the exceptions to the rule are exceptionable, referring of course to the quality of the hitherto unpublished contents. Raymond J. Healy proved this with his specially commissioned " New Tales of Space and Time " (reviewed in *New*

Worlds No. 18), and noted author and erstwhile literary agent Frederick Pohl rang the bell again with a superlative collection of brand-new short stories called *Star Science Fiction*, the English edition of which is announced for publication in the autumn by Boardman. Watch out for this book.

The third, and numerically least, category offers original science-fiction novels, always an attractive but not necessarily rewarding task for the reviewer. The recently published *Hole in Heaven* by a new author, F. Dubrez Fawcett (Sidgwick & Jackson, 9/6), is the first of a new series of British Science Fiction Novels edited by Angus Wilson. With the best of intentions, the editor states that the major fault in modern science-fiction is the lack of realism in characterisation. In this novel of possession by an entity from another dimension the author leans too far to preserve this supposed realism, and the average science-fiction reader will not, I fear, take kindly to the resultant banality of dialogue and stupidity of characterisation. The story concerns an explosion in a chemical works killing two men and leaving a third barely living and unrecognisable. The survivor is taken to a local hospital, and miraculously pulls through although weird manifestations take place in the emaciated and skin-grafted body, as the personalities of the three victims each in turn try to repossess the body. During this spirit world struggle an extra-dimensional entity takes the opportunity to break through, and by an obscure process of matter-control transforms the near corpse into a healthy new body with a mind empty of former knowledge but with an amazing aptitude for learning. Appropriately named " Nemo " this being is the subject of conflict between rival doctors, a distraught nurse, anguished parents, and an opportunist newspaper editor. " Nemo " appears to lack all human emotions, but has a super-human capacity for absorbing knowledge and finally the menace to Earth is revealed as the entity makes preparations for the mass invasion from this other ' place,' plans which are luckily thwarted in time.

Leslie Flood