STARTLING stories

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A Complete Full-Length Novel

Featured Novelet

Short Stories

Features

N. L. PINES, *Publisher*; ED ROFHEART, *Art Director*; SAMUEL MINES, *Editor*

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While the frantic rescue mission went on, the alien spaceships watched . . . and waited . . . ready to pounce!

Illustrated by VIRGIL FINLAY

SPACEMEN LOST

A Novel by GEORGE O. SMITH

I

OVER the hubbub and chatter came the brief warning wail of a small siren. The noise died as the people in the vast waiting room stopped talking.

"Your attention, please!" boomed the loud-speaker. "Passengers for Spaceflight Seventy-nine, departing for Castor Three and Pollux Four, will proceed to Gate Seven for ground transportation to the take-off block. Spaceflight Seventy-nine, waiting for passengers at Gateway Seven!"

There was a moment of silence, then a loud racket burst out as everybody started talking at once. There was only a small flow of people toward Gate Seven, almost negligible, because Flight Seventy-nine was essentially a cargo hop. In fact, this morning less

than a half-dozen headed for the gateway.

Among these was a tall man, impressive in his blue-black uniform. A space commodore, no less. He carried the light bag of the woman who was beside him, proud and happy and eager-looking. But traces of some internal storm clouded the man's features, and as they approached Gateway Seven, the man's perturbation worked closer and closer to the surface until finally it broke through.

"You could still back out," he said.

"No, I couldn't," she said. Her own face clouded a bit.

"Yes, you could," he snapped.

She stopped ten or fifteen feet from Gateway Seven and turned to face him. She was pert and pretty in a traveling suit of gray; brand-new for this occasion. Her name was Alice Hemingway, but she would have swapped it in a minute to become Mrs. Theodore Wilson, even on a commodore's salary.

"Look, Ted," she said slowly. "We've been back and forth over this argument for a couple of months now. Can't you forget it?"

"No, I can't," replied Ted Wilson. "I don't like the idea of you taking to space."

"I do," she said simply. "I want to see these places you are always telling me about. I want to see 'em before I'm sixty. It's no fun listening to your stories, then having you trot off for three or four months on another jaunt while I sit home alone and wonder where you are and what's doing."

"But we—" He paused, thinking. "Alice," he said suddenly, "will you marry me?"

A welling of tears came then, but Alice blinked them back. "If you'd asked me that a month ago I would have said 'Yes,' with no stipulations, but right now I'll say 'Yes, as soon as I come back, if you still want me.' Understand?"

"Not quite."

"I want you to be dead certain that the reason you want to marry me is not to keep me from taking this spaceflight."

Ted looked down at her. "I'd really like to know if you accepted this trip just to force me into asking you," he said slowly.

"You'll never know," she said with a bright smile.

He swore under his breath. "I still don't like the idea of you trotting off to Castor Three with that old goat."

"Mr. Andrews? Old goat? Why Ted! You're jealous."

"I am."

"Good. Stay jealous. But don't be an imbecile. Mr. Andrews is merely my boss, not my lover. He has never so much as watched me walk, let alone made a pass at me. I couldn't think of him as anything but a boss."

"But up there—"

Alice shook her head. "Forget it, Ted. I'm still your girl, and I intend to stay that way. Even though it's smart for a girl to have a lover or two before she marries, I'm the old-fashioned one-man type. Virgin. No hits, no runs, no errors, and no one left on first base."

"Okay," he said sullenly.

She smiled up at him again. "Ted," she said seriously, "don't you see I have to go a-space? You've ducked marriage because you can't see two people living on a commodore's salary, and also with you flitting off and leaving me home alone. So you want to wait until you get your next boost. But that will get you stationed on some planetary post. I'll get one flight to Base, then be set down for years. Well, until that time I'm going to travel and see the interstellar sights. I want to see the Dark Column on Procyon Five, I want to visit the Golden Rainbow on Castor Three, and toss a penny into the Bottomless Pit on Pollux four, and . Well, I can do these things so long as Mr. Andrews wants me to travel."

"But—"

"Oh, Ted—please!" she cried.

She clutched at him and buried her face in his shoulder. He held her, then put a hand under her chin and lifted her face. He kissed her, not tenderly, but with more of a frantic striving for some-

thing beyond reach.

The siren wail lifted again and the loud-speaker boomed:

"Last call for Spaceflight Seventy-nine at Gateway Seven. Will Miss Alice Hemingway please proceed to Gateway Seven!"

Reluctantly she withdrew herself from her sweetheart's arms and turned to the gateway. Ted picked up her small bag and followed her.

As they reached the gate a smallish, nervous, wiry man with a clipped gray mustache eyed Alice crisply.

As Commodore Wilson turned away, the bus drove off along the road to the waiting spacecraft.

COMMODORE WILSON entered the base commander's office and smiled glumly. The commander, Space Admiral Leonard F. Stone, a man of about forty-five and as lithe and as hard as a man of that age could be, looked expectant. His command was exacting and just, but he was also human.

He said, "What's troubling you, Wilson?"

Thimble, Thimble

THE problem of locating something lost is a problem in two dimensions today—even a lost airplane. For a lost airplane is presumed to be down. And even in two dimensions, a search for something missing is a tremendous task, covering huge areas of the earth which must be combed in a definite pattern.

Picture this search expanded to three dimensions in space. Picture all distances extended from miles to light years. Picture the smallest degree of error and how great it becomes when run out to a distance of several light years. And try to imagine the difficulties of a search for a tiny ship lost in space. Or—read it here in this gripping, different story.

—The Editor

"Ah, Miss Hemingway, you're just in time," he said. He smiled thinly as he looked at Ted Wilson. "However, I presume the delay was justified. Commodore, I think the use of your handkerchief is essential."

Before Ted could reply, Mr. Andrews had walked through the gateway to the waiting spaceport bus. Alice turned back to Ted and held up her face. This time their kiss was less frantic, but also less personal. It was chaste, and brief, and proper. It promised for the future, but it did not give any part of that future warmth or passion as a down payment.

Then Alice came out of his arms and went through the gateway to climb into the bus beside her boss.

"Admiral," Ted Wilson said. "I know it is against the unwritten rules to discuss the matter of increase in rank, but I wonder if we mightn't break them for a minute or two."

"We might if there were proper justification. Why?"

"A commodore's salary is just a bit meager for marriage," said Wilson unhappily.

Stone's face clouded a bit and he nodded seriously. "I know," he said. "But there's a reason, Ted. We do prefer to keep our commodores single so long as they're in active flight service. So long as you are well fed, well clothed, and well housed yourself, the monetary payment is sufficient to take care of your personal

needs. I know it is not enough to provide for a wife on top of that. Of course, some men do. And others manage to marry well-to-do women."

"Idine is not well-to-do, but I don't want to make her do with less."

"Naturally."

"Then how about this rank business? I'm afraid that—"

"You are."

"Then when can I expect it?" asked Wilson.

Admiral Stone looked at him determinedly. "You can hasten that process yourself, Wilson. By acting a bit more for the benefit of the Service than you have in the past."

"Why, what do you mean?"

"There's more to rank than merely following orders to the letter. Now, you've never disobeyed orders, and it has been obvious that when orders coincide with your personal ideas, you act eagerly and swiftly. But when orders are opposed to your pleasure you act at the last moment and follow them reluctantly along the thin outer edge."

"For instance?"

"For instance last November. You had front line tickets to the finish post of the Armstrong Classic, but you were ordered on a training flight around and through the Centaurus System, to last no less than ten days and no more than thirty, at your discretion. You returned in ten days and four hours, even though you couldn't see the end of the Armstrong affair. Then, last May you were ordered to Eridanus Seven, which is a remarkably interesting place as I recall from my early days. You got home barely under the wire. Twenty-nine days, twenty-three hours, forty minutes, and a few seconds. Follow?"

Ted nodded slowly. "I felt that my crew would appreciate my attitude," he said.

"Certainly. They did. Both times. They also appreciate your stalling in a stuck-circle, waiting for that last half-hour to expire so they'd draw overtime flight pay. But you've got to remember, Wilson, that we are running the Space Service for the public weal, not for the benefit of the spacemen. A parent does not bring up a child knowing only the pleasant things of life. A balanced program of work and play is essential. I know that the Centaurian run is no picnic, but it is a fine training for spacemen. Now, that'll be all. I'm not criticizing you Wilson. I recall doing similar things myself years ago. It does draw a crew closer to their commander when he gives them consideration. But making them work makes them efficient, and they will also love a commander who mixes well his periods of pleasure with hours of hard work. Agree?"

"Yes. Of course."

"Fine," said Admiral Stone. "So now that you know, we'll watch you for a bit. If you come through, you'll get your increase in rank—and your girl." He smiled. "You're a good commodore, Wilson. But with a little work and application you could be brilliant. We need brilliant men. Remember that. Good-by and good luck, Commodore Wilson . . ."

HIS name translated from his native tongue, was Viggon Sarri. In medieval times he might have been called "Sarri the Conqueror" for his exploits, his conquests. But of course then it was the king, emperor, or caesar who led his own troops.

In these days the ruler sends out men of military might to fight his battles, and Viggon Sarri was not a ruler. His position was the equivalent of space admiral in the Interstellar Service, and though devoted to his own service he was only a paid hand.

His home was far across the galaxy from Sol and the sprinkling of stellar systems colonized by human beings. Viggon Sarri had never met a human, he did not know that this section of the universe had any trace of sentient life. He was just out looking for new worlds to exploit, perhaps to conquer. A new district to colonize, perhaps, or a world of beings advanced at least to the point where the produce and manufacture of his homeland could be sold for metal.

Naturally, Viggon Sarri explored space at the head of several hundred ultra-fast and ultra-hard-boiled fighting spacecraft—fourteen big battle wagons, two fighter carriers each providing a hundred one-man space attack craft, and one hunter, a detecting craft. It was loaded to the astrodome with every device for locating evidences of anything from advanced races to enemy spacecraft.

Sarrie rode in his flagship, one position ahead of the hunter. And so, when the detecting equipment in the hunter registered that some race in this sector of the galaxy was advanced enough to be using the power of the atomic nucleus, Viggon Sarri gave orders for his fleet to spread out in a big, flat dishlike formation, flatwise toward this section of the sky.

It came to as near a halt as anything can approach in deep space, and Viggon Sarri called a conference.

He sat at the head of the table, his two second officers at his left and right. They were equal in rank, Regin Nayle and Faren Twill. This irked them both, and for a long time they had been striving to rise above one another. But only Viggon Sarri knew which was listed in the sealed orders, to be opened only in the case of the death of the supreme commander.

At the far end of the table sat Linus Brein, commander-mathematician of the hunter spacecraft.

Viggon said, "Linus, what do we know about these people?"

Brein thought, then said, "Very little, actually. They use atomic power. They have discovered interstellar flight. They seem to have some interstellar commerce. They use the infrawave bands for communication across space. I would say, off-hand, that they may have colonized no more than a dozen planets, and are exploring perhaps a dozen more. I would also guess that their exploration is done by sheer go-out-and-look techniques."

"Why do you suggest that?" asked Viggon.

"Analogy. Their use of the infrawave is not highly developed. I doubt that they have planet-finding equipment. I have not noticed any attempt to use the infrawave as a detecting and locating means. Only for communication is the infrawave employed by them."

"I see. Any more?"

"Not at present," said Linus Brein. "We will collect more as our men pick up information and our analyzers compile data."

"Keep me posted," ordered Viggon Sarri.

He sat there in silence, a tall man with a thin face that looked wolfish. His ears were flat and distorted, to the human point of view. His eyes were glittery bright, having that shiny cornea characteristic of the nocturnal animal of Terra. He had six stubby strong fingers on each hand and a long double-jointed thumb. Each hand had two palms, fore and back so that the fingers could curl either inward or outward. His elbows were double, one bent in or locked straight, the other bent out or locked straight, as he moved.

VIGGON stared at the ceiling, lost in thought. His eyes, roaming independently gave his features a bizarre look which his own race thought quite natural.

Finally he said, "Has anybody any suggestions?"

Regin Nayle said, "I say we attack as soon as we know more about them."

He felt confident. He believed that his admiral enjoyed swift and decisive action, and by suggesting it he hoped to show that his thoughts ran in the same channels as those of his commander.

Faren Twill said, "It might be better to make allies of them, rather than enemies."

Twill held the notion that Viggon Sarri's main motivation was to build and expand in the easiest, and most profitable manner. And he felt that careful negotiations might pay off better than invasion and strong conquest.

But in truth Viggon Sarri himself did not know which course to take. He was

not above the use of force, if force were needed. Nor was he against the idea of peaceful negotiation, even the formation of an alliance. Which course he would take depended entirely upon what sort of culture this was, how the people reacted, and what they favored. For such knowledge he would rely on data collected by Limus Brein and analyzed by the mathematician's vast bank of computers.

Regin Naylo grunted in a superior tone. "They sound like an inferior race. Inept and primitive. Let's not waste time."

Faren Twill shook his head. "You want to barge in there with the projectors flaming and conquer them by force. That would be easy, but would it leave enough to make the conquest economically sound?"

"Can you sell anything to mice?"

Faren Twill grinned. "Cheese," he suggested. "Besides, an angry gang of rats can do in an elephant, you know."

"Chicken," sneered Regin Naylo.

Of course none of them had ever seen a mouse, a rat, an elephant, or a chicken. But on their homeland, a planet called "Brade," there were myriad life forms, just as on any inhabitable planet. The forms of animal life mentioned were similar enough to permit a free transliteration. "Chicken" also existed in its completely alien form.

But until the native tongue of Brade becomes common to Earthmen, this loose transliteration of their speech characteristics suffices to convey their meaning. Since their grammar bears no relation to any Solarian tongue, it must be converted rather than translated, or even transliterated. So if they sound like people of Earth instead of extra-solar aliens, that is the only way to convey their meaning.

"Twill is right," said Viggon Sarri. "We must be wary. This may be a communal culture, like that of the insect, ant, in which the individual is expendable so long as the nucleus is undamaged. In such a case suicide fighters would swarm over us, and against such we could not stand. If, on the other hand, this is a completely individualistic, or anarchic culture, we must call Brade for help. We would need a horde of space fighters to control the entire group." He looked at Limus Brein. "You will, of course, have their language analyzed?"

"We are working on it now. It is not difficult to connect the sound forms with the meaning, under known conditions and situations. But it is extremely difficult to make such analysis when we have not the foggiest notion of what situation is being described by the sounds. I—"

A WINKING light on the wall called his attention. Limus Brein touched a stud on an armlet. The tiny communicator said, in a thin, tinny voice:

"Commander Brein? Analyst Hogar speaking. The space-strain detectors have just picked up a violent response. The computer-analyzer hands report the following probability to at least three nines: That a space craft has foundered due to the failure of the warp-generator. Have you any orders as to our next moves?"

"Yes, Hogar. Record everything. Analyze everything!" He let the stud snap back into place, then said to Viggon Sarri:

"An ill wind blows, Admiral Sarri. Their misfortune may be our gain."

"It might indeed." Viggon nodded.

"I suggest that we send a fleeter out to seek survivors," said Regin Naylo.

"No," said Faren Twill. "We will learn more by listening to their communications and watching how they face this problem."

"What's better than a being able to interpret his own sounds?" snapped Naylo.

"Taking a little longer by doing it ourselves, and not giving them any warning that there stands another intelligent race not far offside. Why forearm them?"

"Right," interposed Viggon Sarri. "We watch from a distance."

Linus Brein stood up. "I'd best be going back," he said. "This language analysis may get deeply involved. I'd feel better if I could supervise it myself. May I leave, Admiral Sarri?"

"We'll all leave. This conference is over until more detailed information is at hand. My orders are: Take no action, but observe closely and critically. Dismissed, gentlemen. We'll all drink to success!"

Viggon Sarri pressed the stud on his armlet and ordered a tray of refreshments. Linus Brein did not stay for his share.

II

SPACEFLIGHT Seventy-nine took off, lifted on schedule by Pilot Jock Norton. Norton was a big man, rather on the lazy side, but a good pilot. If he had had any ambition at all, he would have owned his spacecraft, maybe a string of several, instead of being a paid space jockey.

But Jock Norton lacked the drive, or perhaps had never seen anything he actually wanted. He was a love-em-and-leave-em kind of guy who spent everything he earned on good times and luxuries. He spent no time seeking out the better pay loads as other pilots did, and so did not collect any of the fancy commissions for being a good businessman. He had gravitated to a standard contract type of job and with this he was satisfied.

His cargoes were invariably bid-basis job lots, instead of valuable merchandise with a delivery factor. He ran mail loads mostly—mail that could not, for legal reasons, be micro-microfilmed, transmitted by farsi-wave, or recomposed by infrawave at the receiving end. Legal contracts, documents, and the like, the one-and-only original of which must bear the *bona fide* signature of both parties.

Norton took the spacecraft up, fired the warp-generator, and headed for Castor Three at about forty parsecs per hour. Then, with the control room on the full automatic, he went down to the salon, because it had been a couple of months or Sundays since he had been pilot host to anyone as young and attractive as Miss Alice Hemingway. Most of his passengers had been businessmen. The few women had been wives of such businessmen, a bit on the dowager side, and therefore more boring than interesting.

But Miss Alice Hemingway was interesting. Not that Jock Norton favored her ash-blond and dark-eyed attractiveness more than he would have admired a redhead or an olive-skinned brunette. He favored all women under thirty who were properly rounded here and there—especially there—and who had clear-skinned faces with regular features.

That Alice Hemingway, secretary, was traveling with her boss made her even more interesting. Norton had cased Mr. Charles Andrews carefully and put him down as a Napoleon type, peppery and active, and probably well-to-do, but not personally attractive to the opposite sex. It was money, decided Norton, that bought a reasonable facsimile of affection to Mr. Charles Andrews.

It would be masculine virility, thought Jock Norton, that would offset the money of Charles Andrews and really bring a proper emotional response from the girl.

"Good morning," he greeted them from the last step of the ladder that led down from the control room.

"How do you do, Pilot Norton," responded Andrews.

"My goodness!" exclaimed Alice. "Isn't that dangerous?"

"Isn't what dangerous?" asked Norton, with a wide, lazy smile.

"Your leaving the ship to run itself."

"Not at all." Norton showed his superior knowledge. "Our auto-pilot is the best that money can buy and maintain. And after all, Miss Hemingway, there is little a pilot can do while we are in transit. The auto-pilot does the job from after take-off to before landing. In between, the human pilot relaxes and enjoys his space travel. So—may I

build you a cocktail? Or maybe you'd prefer a highball."

"At this hour in the morning?"

Norton laughed and inspected his watch, "I admit that it is ten o'clock by Chicago time. But it is past midnight on Polaris Two at Minervatown. It's three A.M. in Lygport, Procyon Five. It's even three o'clock in London, Terra."

"Besides," said Charles Andrews curtly, "we're hard at work."

"Work?" exploded Norton loftily. "You're hard at work in deep space?"

"Certainly. Deep space or hard planet, work must go on. I did not get where I am by goofing off, Pilot Norton."

Jock Norton grinned. "All work and no play, you know."

"All play and no work is worse."

"It's more fun," said Jock, with a feeling that he was coming off second-best in this fool argument. "Look," he said, "everybody relaxes in deep space. It's customary. It's holiday."

"It's damn foolish." Andrews turned to Alice. "Miss Hemingway, what do you think?"

"I'm half inclined to agree with you, Mr. Andrews. But you must know I'm thrilled to be a space. I've never been off Earth before."

"Oh. Then I capitulate. Pilot Norton, will you give Miss Hemingway a space tourist's run of the ship, please?"

"Be happy to." Norton nodded.

HE LOOKED around the salon, from face to face. There were four others there, all of them watching with a blank sort of interest. Norton took a deep breath of inner cheer for his luck. All the rest looked as though nothing could be as boring as a tourist's run of a spacecraft. He made the gesture of asking, but all shook their heads.

Norton opened the small bar and set everyone up to cocktails. Then he said to Alice, "Now, let's start at the bottom and work our way up."

"Any way you say," she told him.

Andrews got to his feet. "I think I'll tag along."

Norton swore below his breath.

Alice walked between them as Norton explained the workings of the spacecraft. She found Norton a good talker, and his lazy manner of speech somehow managed to convey a lot of information that a more intense man would have flubbed, because of a greater preoccupation with facts.

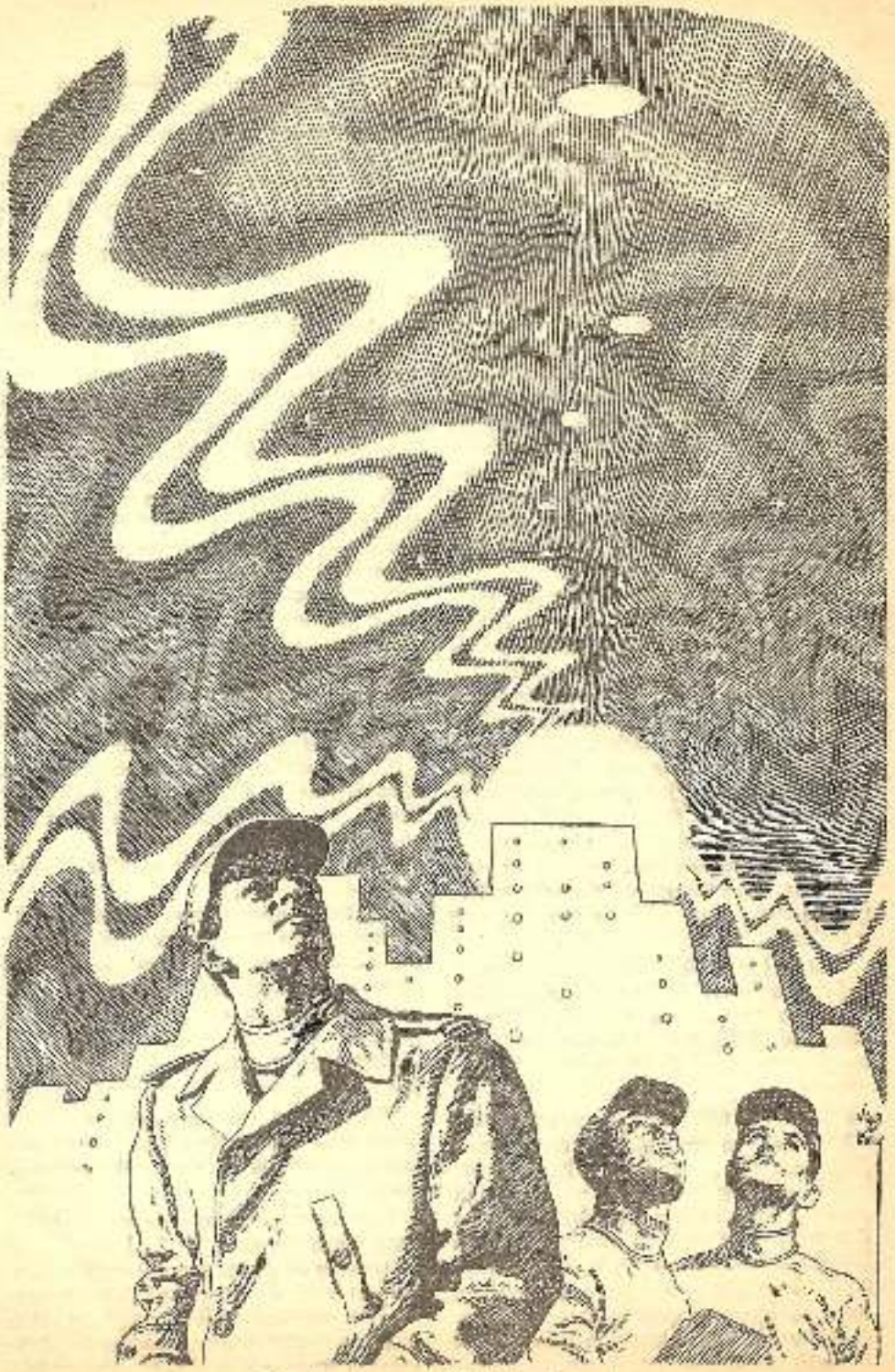
Even Mr. Andrews seemed interested, although he had been in space many times before, as a matter of business.

Norton explained the workings of the power pile in a much oversimplified way, showed them the various rooms of machinery for maintaining air and water and electrical circuits throughout the ship. As he had suggested, they started at the bottom, looking out through the below-hatch at the hull of the ship, where the misty blue corona flared down and back from the eight tubular drivers that thrust their blunt cylindrical noses down in a large circle, surrounding the after viewport.

Then Norton worked them aloft slowly, up through the room filled with water for the reaction mass, and hurled out from the throat of the driver tubes as a molecular-atomic gas so highly energized that it was not water, but nascent hydrogen and oxygen, completely ionized. The coronal flare below, he explained, was the recombination of the nuclei with their electrons in shells, and the partial recompositions of the gases into water.

He showed them the warp-generator that created the extra space field around the ship, nullifying every physical attribute of matter. Neither mass nor inertia remained, so that the thrust of the flare had no resistance against which to exert its force, resulting in a drive that violated the Einstein equations. Forward velocity reached terminal when the interstellar matter provided a tenuous medium against which the velocity of the ship found resistance.

He showed them the magnetic-mass detector that protected them against meteors, and explained that while the thing was primitive, it was the best that Mankind had. The infrawave was hope-



The dome became a riot of flaming green

less because it had an instantaneous velocity of propagation and was also nondirectional, and therefore neither direction-finding nor ranging could be accomplished with the infrawave.

But the magnetic-mass detector was not as hopeless as it looked.

He said casually, "There were a lot of tall stories back in the Early Twentieth Century about spacecraft filled with course-computing gear that measured the course of meteorites, then directed the spacecraft. A more practical study of any such device shows that any extraneous object that does not change its aspect angle is necessarily on a collision course. Ergo, any target that does not move causes the alarm to ring, and the autopilot to swerve aside." He grinned and added in a low voice, "We're as safe as if we were all in bed."

As his arm touched Alice's she realized that Jock Norton had been entertaining the idea of bed ever since this tourist's run had started. She smiled because it amused her. Jock Norton had made a snap judgment, probably because he had seen a lot of such shenanegins as man and woman playing employer and secretary before. She almost laughed at Norton, realizing that he was displaying all of his knowledge and his virility in the hope of convincing her that he was probably more fun in bed than the elderly Napoleon type with whom she was traveling.

She stole a look at Andrews, comparing the two men. She wondered whether Andrews had cottoned onto Norton's play and if he had, whether her boss found it funny or irritating.

AS THEY walked along a curved corridor, she saw with some surprise that twice Mr. Andrews had lagged back a bit, then had come forward behind them to walk by her side instead of on the far side of Jock Norton. And both times Norton had quietly lagged back to circle her and step forward between them, explaining quietly that Mr. Andrews could hear his explanation better if he, Norton, walked between.

Alice was still wondering whether Charles Andrews actually held any off-trail notions about his traveling secretary when all hell broke loose.

First came the wild clangor of an alarm, and the automatic cry of a recorded order:

"Your undivided attention, please! This is urgent! You have eleven minutes from the end of this announcement to follow these directions. There has been a partial failure of the warp-generator. If this failure becomes complete, and the space field collapses, the effect will be that of precipitating intrinsic mass into the real Universe while traveling at some high multiple of the velocity of light. The spacecraft then will drop instantly below the speed of light but in doing so will radiate all the energy-mass equivalent to those multi-light speeds, according to the Einstein equation of mass and energy. It is therefore expedient that you repair to the lifeship locks and prepare to debark. The partial failure may or may not continue. If not, there will be no more danger. But in case of continued breakdown—"

The recorded announcement stopped abruptly as a louder alarm bell rang briefly. Then another voice from the squawk-box shouted:

"The warp-generator is failing! You have—

"A third voice came in automatically saying, "Eleven minutes," after which the second voice continued neatly, "to make your way to a lifeship and debark. Please do not panic. You have plenty of time."

"It's this way," Norton said anxiously.

"We'll find it," said Andrews. "I know this spacecraft type. Hadn't you better take care of your other passengers?"

Norton wanted to swear. It would have been so neat if Andrews hadn't insisted upon coming along on this tourist's run of the spacecraft. As it was, Norton couldn't quite bring himself to suggest that Andrews take care of the other customers while Norton himself

took care of the girl. On the other hand, Norton had no intention of rushing off to take care of the others when they were probably being taken care of right now by the engineer-technician. He said that, and repeated it to give it force.

"This way," he said.

The announcer bawled, "You now have ten minutes!"

"Couldn't I get my bag?" pleaded Alice.

"Anything of real value in it?" asked Norton.

"Not really."

"Then we'd best leave it." Norton breathed a sigh of relief. Now she wouldn't find it more expedient to travel with the bunch upstairs.

He led them up a flight of curved stairs and around another curved corridor as the announcement howled:

"Nine minutes!"

The squawk-box said, in a more natural voice, "Jock? Look, I've got this section under control. How're you doing?"

"I'm doing fine, Limey. We're almost at the below-station lock."

"Be seein' you. Luck."

The announcement yelled:

"Eight minutes! You all have plenty of time. Remember, safety is more important that blind speed! Listen!"

The tremolo of an organ filled the spacecraft—vibrant, thrilling, brilliant music rising over the *throb, throb, throb* of heavy bass, beating time just fast enough to keep feet moving briskly, but nowhere fast enough to cause panic or fumbled steps.

"Seven minutes!" came the cry.

NORTON'S hands closed on the space lock and he twisted the emergency handles. The inner door swung open ponderously and they walked past the portal. The lock swung behind them and the dogs went home.

"Six minutes!" came a less resonant call from a smaller loud-speaker in the lock.

Jock Norton handed Alice through the small space lock of the lifeship, boosted Andrews in after her, then climbed in himself.

"Five minutes!" was almost cut off as the lifeship space lock swung shut.

"Four minutes!" came as the big outer space lock was cracked.

Norton's hands on the lifeship controls moved and the little spacer leaped out of the doorway.

On the infrawave they heard the call of "Three minutes!" then "Two!" and finally the announcement, "You are now all debarked and are in places of safety. The distress call has been sent constantly from the moment of danger. Sit tight and make no foolish moves until help comes. Do not look to the rear, as the explosion of a collapsed field generator is brilliant enough to scar the eyes—"

The voice stopped abruptly as there came a wave of sheer heat. The ports on the side of the lifeship faced blue-white, and the spacecraft bucked as though it were being driven into a heavy gas cloud.

"What was that?" blurted Andrews, picking himself up off the heaving deck.

Norton shrugged. "That was Spaceflight Seventy-nine going to hell in a wicker basket," he said.

"But why? We weren't hit by anything."

"You can bet not," Norton said cheerfully. "Don't you know about spaceflight factors? The Einstein equation?"

Andrews eyed the pilot coldly. For several hours the younger man had been explaining all sorts of things in a condescending manner, showing off his knowledge in a field that he knew far better than any one else present. This was galling to the financier, who was used to paying mathematicians and physicists small change.

"I don't have time to clutter up my mind with equations," he told Norton coldly. "I usually pay people to have them explain these things to me. So go right ahead."

Norton's thick hide sloughed off the insult because he was still the bright one.

He said, "The original Einstein equation of mass and energy shows that as

the speed of light is reached, the mass reaches infinite mass. This is an obvious impossibility, since ever the total mass of the Universe is not an infinite mass. So when a body traveling at faster-than-light is hurled into the real Universe by the collapse of the warp-generator, for the barest instant it is actually traveling beyond light. This causes it to assume some unknown factor of mass that no physicist has been able to theorize yet, but must be the impossible infinity-plus. At any rate, the fabric of space is twisted, as if by a gravitational field so powerful that the field wraps up around itself and forces the mass into a Universe of its own."

"You're talking gibberish."

"Sure I am. But you find me someone who can explain this effect without talking like an imbecile and I'll buy you a good cigar."

"All right—go on. What is supposed to happen?"

Norton shrugged. "If a volume of space is removed from the structure of space—this is more gibberish, Andrews, believe me—then there must be an instantaneous flow of space back to fill the gap. Now, for God's sake don't ask me why empty space has got to flow into a place where some empty space has been removed. I've always been taught that nothing from nothing leaves nothing. Maybe nothing from nothing leaves less nothing than before, but that sounds as silly as the rest of the whole foul argument. At any rate, every time a warp-generator collapses, the same twist occurs in the structure of space. There have been billions of bucks' worth of equipment shot into nothingness by the White Sands Space Academy in the last hundred years, just to see if someone can come up with a logical answer."

ANDREWS said coldly, "All right. So now what do we do?"

"We sit it out," Norton said cheerfully.

"Doing what?"

"Decelerating to a velocity below light. We still have our ship's intrinsic to get rid of, you know."

"Why don't we keep on?"

"Because this is a liteship and not a spacecraft. We have only enough space power to pull ourselves down safely, with some reserve, and then we use the reserve to emit our distress call. Cheer up. We got off safely. This will be a breeze."

"It will? And why are you so happy about it?"

Jock Norton smiled, then said the one thing that removed all and any chance of Alice Hemingway ever looking upon him as a desirable character, virile or not.

"Spaceman's insurance," he said. "For spacewreck, one thousand cold clams. For debarking with every passenger within a reasonable distance of my position at the time of distress, an award of one thousand more frogskins each. This is not so much an insurance award as it is a reward incentive for a spaceman to do the right and proper thing. Then, for every lonely hour adrift in deep space, from the time of distress until we are collected safely, one hundred fish. This should add up to a neat sum by the time we are picked up. Tommy Walton and Joe Lake drifted for eight hours and collected. Sure, we're sitting pretty and we'll be rescued in due time. So let's settle down and take it easy."

Andrews said, "I suppose you've spent half of your time a-space hoping for some disaster so you could collect a neat pile."

"Not quite that bad. This is likely to be sure rough before we're collected. But it does pay off. So let's relax, huh?"

Alice was breathing a silent prayer to Commodore Wilson that he make it a quick run. She was sick and tired of spacing already.

Admiral Stone said, "These are your orders, Wilson. You are to take your squadron out to Cube X-Z-Fifty-nineteen, District Forty-seven. You'll have to comb it inch by inch."

"I'll comb it millimeter by millimeter," asserted Wilson. "Miss Hemingway was on that spacer."

"Don't do anything foolish," warned the space admiral. "Just remember that you're a flight commodore and not a full squadron commander yet. You have your orders."

"I have. And I'll bring them back. Both lifeship loads."

"Then get going. Remember that every hour decreases their chances of a safe rescue. Luck, Wilson. Spaceman's luck!"

"Correct, Admiral Stone."

Less than a quarter-hour later, Ted Wilson's flight of twenty-five swift light spacecraft went barreling up out of Chicago Spaceport and into that region of the sky called Gemini. . . .

Viggon Sarri sat in the main control cabin of the hunter spacecraft, quietly waiting for Linus Brein to finish some involved equations in logic symbols. When the long string of symbols had come to what looked like a satisfactory conclusion, Brein looked up.

"Any success?"

"Oh, yes indeed." Brein nodded. "Of course our interpretations of their speech is only symbolic at this point. But this much we know. This series of sounds—" he snapped a switch on the side of his desk and a wall speaker delivered a series of what sounded to them like sheer gibberish. "connotates as follows: Voice A has called for contact with any receiving station. Voice B has responded, informing A that he is ready to receive. Voice A then delivers a running account of the disaster, delivering his computed position, vector of travel, and space coordinates. I've untangled some of their tongue." Brein replayed the recording and stopped it after the first passage. He parroted the gibberish, "'Spaceflight Seventy-nine calling Distress.' That, Viggon, is interpreted in our tongue as 'Identification Number So-and-so calling to announce disaster.'"

HE LET the recording run a bit then said, again parroting the gibberish, "'Chicago Spaceport, Interstellar Service to Spaceflight Seventy-nine. We read you five by five, go ahead. What is your distress?' We interpret the reply as, 'Base of Operations has received your distress call. Please elucidate.' What follows defies identification, Admiral Sarri. Until we can meet one of these people and learn more of their physiognomy, we cannot hope to unravel their numerical system. Damn it, we don't even know how many fingers they have."

"Or," suggested Sarri drily, "whether they might have stopped counting on their hands."

"Indeed." Linus Brein nodded thoughtfully. "However, not long after the reception of this distress signal, the entire intrawave band seemed to fill up with all sorts of signals, all of them repeating the sounds that we assume are the space coordinates of this foundered spacecraft."

"Indicating that this is not a completely anarchistic or communal, insect-type culture. The individual is important."

"I would say so."

Regin Naylo smiled. It would have been an odd-looking facial grimace to an Earthman, for it turned the corners of his pencil-thin lips down and furrowed the skin of his head between the gleaming eyes and the low, ragged hairline.

Viggor Sarri said, "What do you find so amusing?"

Regin replied. "If they are individually important, then the culture finds the individual important, as opposed to the insect-type which wouldn't mind losing a few billions so long as the inner hive is intact, or the anarchistic culture where the loss of a unit is not even noticed, because every one of them is so preoccupied with his own affairs that he can take no time to consider the next man."

"Right. So what?"

"I say let's hit 'em while they're all occupied in trucking down the survivors of this wreck."

Faren Twill grunted sourly. "Ever try to interfere with a dog and her pups? You get bitten whether you mean good or ill. If you care for my opinion you'll . . . Or do you give a damn?"

"Go ahead."

"I say we just slide in there quietly

and collect the lifeships. Then, later, we can go in boldly and establish our superior position."

Regin Naylo shook his head superciliously. "I say we should hit 'em with all we've got and establish our physical superiority. Look, Faren, either way this gang of subhumans is going to end up in some form of servitude to us. Let's make it the quick and dirty way and save manpower. Besides, what can they possibly have that we want?"

Twill shrugged. "Any subject race is a good market."

Naylo laughed. "I'd rather shove it down their throats by taxation. Then we'd collect without having to give them a string of uranium beads for exchange."

Faren Twill asked Viggon Sarri for his opinion.

Viggon said, without changing expression, "There are races that will not abide the idea of collaboration, and there are races that either revolt or die under any superior government. It has been my lifework to expand the Brudian culture, one way and another, across the galaxy. When we finish with this problem here, another world—in this case another series of colonized worlds—will enter one of the forms of economic relationships with Brade. Whether we blast in and smash them, or ooze in and coerce them quietly; take them over, or hail them as an ally."

"Ally?" roared Regin Naylo scornfully. "This bunch of primitives who haven't even got an infrawave detector?"

"Ally?" snarled Faren Twill disgustedly. "This people who cannot protect their spacecraft from warp failure?"

Viggon Sarri held up his doubly-prehensile hand. "Either of you may be right," he said. "But remember that we do have time. So we'll wait until we know more about their basic character before we take any course. Go consult Linus Brein. Watch his computations and his evalutations. Come back when you have more complete data for your own evaluation."

Naylo and Twill left together.

Viggon Sarri called Brein on the ultra-infrawave.

"Linus? My headstrong youths are coming over to look at your data. Like any other kids they know everything, but dammit, like a lot of kids one of them may be right. Maybe I'm overcautious. So give them all the data you have, and let them evaluate it. I'll happily pin a medal on one of them if he's right and I'm wrong. Okay?"

Linus Brein agreed.

III

UNDER the temporary command of Commodore Theodore Wilson the space squadron sped out into the uncharted wastes of the sky on the true line toward Castor. Slowly, as the squadron flew, its component spacecraft diverged in a narrow cone so that the volume of space to be covered would fall within the scope of the detection equipment aboard each ship. Computers flicked complex functions in variables of the laws of probability, and came up with a long series of "and or-if" results.

Toby Manning, Master Computer for the squadron, sympathized when Wilson showed the latest sheaf.

Wilson grunted, "This is no damn good at all. It sort of says that the lifeships will be wherever we find them."

Manning nodded. "Like the problem of catching a lion on the Sahara Desert. You get a lion cage with an open door, electronically triggered to close at the press of a distant button. Then the laws of probability state that at any instant there exists a mathematical probability the lion is in the region of the cage. At this instant you shut the door. The lion lies within the cage, trapped."

"Stop goofing off. This is no picnic. Have you any idea of how many square light years we have to comb?"

"Cubic light-years, Commodore Wilson."

"Cubic. So I'm sloppy in my speech, too? Look, Manning, all we really want from you is the overall cubic volume in which the lifeships must be. You know

the course of Flight Seventy-nine. You know the standard take-off velocity of a lifeship. The forward motion plus the sidewise, escape velocity, produces a vector angle which falls in the volume of a cone because we don't know which escape angle they may have used. We can pinpoint the place of escape fairly close."

"Yeah, within a light year. Maybe two."

"And we know that the lifeship will reduce its velocity below light as soon as possible."

"Naturally."

"So somewhere on that vector cone, or within it, is a lifeship—two lifeships—traveling on some unknown course at some velocity considerably lower than the speed of light."

"We've located 'em before. We'll locate 'em again."

Wilson shook his head worriedly. "That's a lot of vacant space out there. Even admitting that we have the place pinpointed, the pinpoint is a couple of light years in diameter, and will grow larger as time and the lifeship course continues. Or," he added crisply, "shall we take a certain volume of space and assert that a definite mathematical probability exists that the survivors lie within that volume?"

"Sorry, Commodore. I didn't mean to be scornful."

"Well, then, you'd better set up your space grid in the coordinate tank and we'll start combing it cube by cube."

"Correct," said Toby Manning.

The "tank" was not really a tank. It was a stereo projection against a flat glass wall at one end of the big Information Center. Room below the bridge section of the flagship. Wilson went there some time later to watch the bustle as the tank was set up to cover the segment of space they intended to comb.

Even looking at the thing required some training. The plotters and watchers wore polaroid glasses to provide the stereo effect. Through the special glasses, the tank looked like a small scale model of this section of the sky. Castor and Pollux and other nearby stars were no longer pinpoints on a flat black surface, but tiny points of light that seemed to hang in space, some in front of and some behind the position of the screen itself.

Behind the glass screen, a technician was carefully laying a curve down on a drawing table with a pantagraph instrument. As he moved the pencil point along the curve, a thin green line appeared in stereo, starting close by and abruptly, and leading towards the dot labeled Castor.

The loudspeaker said, "This green line is the computed course of Space-flight Seventy-nine."

A RED KNOT was placed on the line. "This is the approximate point of explosion."

Wilson asked, "Is that nominal or is that placed on the minus side?"

"The spot is placed to give the maximum factor of safety."

"Good."

"Now, after considering the probable velocity of escape from Seventy-nine, which would be a lifeship leaving the mother vessel at a ninety-degree relative course at full lifeship speed, we find a vector combination of velocities and courses that diverge from the main course."

From the red knot another line went out at a small angle to the original course, thin and red.

"But because we have no way of knowing what the axial attitude of Seventy-nine was at the moment of escape, the volume of probability now becomes a cone."

The angled red line revolved about a green course line describing a thin cone, its base pointed toward the star, Castor. As the line revolved about the axis of the cone, it left a faint residue behind it, which became a thin, transparent cone.

Manning said, "Our field of operations lies within this cone."

Someone running the projector went to work. The scene expanded until the thin red cone filled the screen and seemed to project deep into the room, its apex

almost at the eyes of the watchers. Then a polar pattern appeared across the cone near the apex, a circular grid marked off in thin white lines, each line numbered, each area or segment, marked with a letter.

Down the room where the cone was larger, another grid appeared similarly marked.

Manning went on, "We cannot tell, of course, at what point in the collapse the survivors made their escape. We know that the automatic circuits begin deceleration as soon as the warp-generator shows signs of failure, the hope being that the spacecraft will fall to a safe velocity before the field collapses completely. Therefore escape could be made at any velocity between forty parsecs per hour, if they escaped before the deceleration began, or at normal under-light velocity, which might take place if the spacecraft had succeeded in dropping to safety before the field collapsed. However, in that case, there would have been no explosion and our space wreck victims would have remained in the spacecraft, or returned to it as soon as they saw it was safe. Therefore, integrating the probabilities outlines here, the survivors must lie between the planes of maxima and minima, representing escape at maximum forward velocity and minimum forward velocity. Here, gentlemen, is your search grid."

The rest of the stereo field went out, leaving the white lines of the grids. Lateral lines now appeared to connect intersections of the fore grip with the corresponding intersection of the aft grid.

"We are here."

Tiny discs of purple dotted space before the small end grid. The discs were flat-on to the grid and represented the maximum distance for space detection of matter.

Wilson felt something touch him on the arm. He turned. A tech-operator standing there had a bewildered look on his face.

"Yes?" said Wilson.

"I'm puzzled, Commodore. Suppose we don't find them in a long time. Won't that far grid have to be pushed back?"

"No," Wilson explained wearily. "The function of a lifeship is to get its occupants down below the velocity of light and then coast. Since that grid represents a total distance of about ten light years, they'd have to be floating for ten years at the velocity of light to make it. Any normal speed, over a period of weeks, would hardly appear long enough to cover the thickness of one of the grid lines."

"Ten light years!"

Wilson nodded and repeated. "This is no picnic." He turned from the tech-operator to the planning table. "Unless someone has a better suggestion, we'll set up a hexagonal flight pattern with a safe detector overlap and start by cutting a hole down through this grid volume along the prime axis. Anybody got any other suggestions?"

Space Captain Frank Edwards shook his head. "Not unless someone has improved on the *Manual of Flight Procedures*," he said.

"Okay then. Here we go."

COMMODORE WILSON leaned back and watched the grid as Edwards got on the ship-to-ship and gave the operational orders. The little discs rearranged themselves slowly into a hexagonal lattice with their edges overlapping, then the flight began to move forward into the grid, running down the line of axis.

Somewhere inside of the cage made by the white lines a lifeship was drifting, a sub-sub-microscopic mote alone in a volume of space so large that light would take ten years to traverse the volume from top to bottom.

Wilson shook his head and took off his polaroids to brush his eyes. The stereo-field collapsed flat against the glass screen and became a meaningless jumble of lines. Wilson put his glasses back on hastily.

Captain Edwards said softly, "Take it easy, Ted. We'll find her."

Wilson nodded, "I know. But I can't

help thinking how rough it must be."

"Why?"

"To take her first space flight and get involved in a blowup."

"It will be an experience she'll never forget, but it shouldn't be too hard on her. It isn't as though she were completely alone, you know."

"No, I suppose not. She probably got out with anywhere from two to eight others. A lot of those were—well, not real spacemen, but at least they were regular space trippers. I—"

A detector alarm rang and everybody jumped to the alert. Edwards barked an order and one of the flight techs darted off toward the launching deck. There was no point in stopping the whole flight, for any detection of matter would be investigated by one-man scooters. If a lifeship should be found, an infrawave call would bring the search flight hurrying back.

This was not it. The flight tech reported a small clutter of pebbles and frozen gas. Probably a comet on its long, cold, dead swing near aphelion.

And the search went on. . .

Charles Andrews snorted angrily and growled, "It's damned inefficient, that's all I have to say."

Pilot Jock Norton shrugged. "We're alive."

"But why can't we pack on some power and get going somewhere?"

"Because this is a lifeship and not an interstellar spacecraft. I told you that before. D'ye expect a lifeship to be as big as the carrier?"

"Don't be an imbecile."

Norton towered over Andrews. "Don't be too bright, Andrews. Ships don't founder once in a green-striped moon. The function of a lifeship is to protect the customers until help can arrive. Our storage bank held enough quick-power to counteract the speed of the lifeship, with a safety factor. We've a small accumulator cell for temporary storage. It ain't pheasant under glass and brandy, but we'll neither starve nor die of asphyxiation. We're alive and healthy. So just wait it out. I told you that, too."

"I don't like it."

"Do I sound as though I did?"

"You seem to," Alice said reproachfully.

Norton gave her a bland smile. "I didn't intend to imply that I was in love with this clambake. Sure, it's a rough situation, but there's little point in looking at the black side."

"How long will this take?" she asked.

"Maybe a couple of days," he said easily. "Maybe as long as a week. Maybe even more. But we'll be all right."

"At a hundred dollars per hour," sneered Andrews.

"It ain't hay."

Andrews pulled a long pale cigar out and lit it with a flourish. "Norton, tell you what I think of a hundred dollars per hour. I'll take that week you mentioned as an outside limit and if you can do something to get us home before that

[Turn page]

date, I'll pay you one thousand dollars for every hour under that week."

"Nuts!"

ANDREWS said firmly, "Miss Hemingway, witness this, please. Do something brilliant, right this moment, Norton, and you'll collect seven times twenty-four times one thousand dollars. Now that's what I call not-hay."

Norton growled angrily, "If there was anything I could do, I'd take you up on that."

"There probably is, if you'd only try to think."

"I'm the space pilot," Norton pointed out. "And I'm telling you there is nothing we can do about it."

"All right. Forget it. Let's have something to eat."

"We don't eat for an hour, Andrews."

Charles Andrews puffed on his cigar. "Why not?" he asked softly.

"Because we've got to conserve. It's in the book of rules."

"Rules are made to be broken."

"Not space rules. And I'm still skipper, you know."

"No matter how—" Andrews was going to say "incompetent" but he stopped short as Norton got lazily up out of his chair and came forward. Andrews realized he could push Norton just so far, then the pilot would lose his laziness and began getting violent. Andrews could not stand up to violence. He was not big enough. He was not young enough.

Alice said calmly, "Stop it, both of you! You'll just make trouble for all of us."

Norton sat down again. Doggedly he said, "We'll eat in an hour."

Andrews turned to Alice. "Miss Hemingway, are you, perhaps, a bit hungry?"

She shook her head quickly. "Frankly, I couldn't get it down and keep it."

"Then perhaps in an hour," said Andrews. "I was only thinking of your comfort."

Alice squirmed. Both of them were, in their own way, fighting to control the situation. Andrews had just eased out of the indignity of having an order or request countermanded. Norton had just ignored an implied insult.

So long as they struggled, quietly, nothing would result but well-rubbed nerves. But if open conflict broke out it might get rough indeed.

IV

FAREN TWILL looked across the table at Regin Naylo. They were alone, and finally Twill voiced the thought uppermost in both of their minds:

"This waiting is ridiculous, Regin."

"I agree. In fact, the only point upon which we disagree is the method. I say hit them hard, and with finality. You want to make an equal-to-equal alliance with them."

Faren shook his head. "Not really," he said. "No real alliance can ever be possible between stellar races. The alliance I had in mind would be patterned on the relationship between mother state and protectorate. We supervise their laws, control their commerce, and apply a small but adequate taxation to pay us for our service to them. Tariffs and duties to be set up for a beneficial economy in our favor, and yet low enough so that they can continue operating, only mildly limited. That sound sensible to you?"

"I think it can be carried out more efficiently than that," Regin Naylo objected thoughtfully. "First we collect the lifeship nearest us, maybe both of them. We sweep down along the line of search and wait in battle pattern. Why, we can probably collect their entire fleet without firing more than a couple of batteries. Then we have the survivors broadcast on the blanketing infrawave that we are applying the rules of space salvage and that redemption of their fleet is to cost some nominal fee—er—say ten metric tons of uranium, nine-tenths pure. After which we take their captured fleet to the seat of their government and take over. Then we are in a real position to make demands. None of this simple taxation and commerce control. None of this

mother state and protectorate. This will be conqueror and vanquished."

"Suppose they fight back?"

"With what?" asked Naylo sarcastically. "Guided torpedoes and A-heads? Faugh!"

"They may have—"

"Bet you a hat. If they have been able to use the infrawave bands for space locating and detecting, they wouldn't get to first base discovering the magnus forces."

"You realize," said Twill, "that you're setting up a pattern of violence that may never be resolved?"

"No matter how you set up the meeting of cultures, you've started a pattern of violence that can never be resolved. I say make 'em realize right now that they are clobbered. And if they want fight, we'll give it to 'em."

Twill growled, "Not too long ago you were cautiously admitting that elephants can be beaten by a pack of determined rats."

"Until they put out more than that squadron of twenty-five spacecraft, they're no real pack, compared to our task force."

"You may be . . . Hush!"

The door opened. Viggon Sarri looking refreshed and alert, greeted, "Good morning. You've heard the latest?"

"What latest?"

"We've probably located the destination-star. From one of the large stars along the flight path of the original spacecraft there has formed a second search squadron of twenty-five spacecraft. The infrawaves are filled with calls back and forth, coordinating the search pattern."

"How are they doing?"

"Depends," replied Viggon Sarri, with a grin. "Poorly, if you mean that their success looks imminent. But excellently, if you mean their technique. They're really covering space like a blanket, slice by slice. But they started on the wrong slice."

Viggon's armlet buzzed timidly and he said, "Yes? Go ahead."

"This is Linus Brein. We have more of their language analogued."

"I'll be right over." To his second officers Viggon said, "Want to come along? This may be interesting."

Naylo shook his head. "We've a bit of a problem to haggle over. We'll be over to Brein's bailiwick later."

"You might be missing something, but it's your decision."

AS SOON as the door was closed behind Viggon, Naylo said, "I wonder if he is getting chicken."

"Don't let him hear you say that."

"I won't. But haven't you wondered?"

"Maybe," said Twill. "But it figures. Viggon Sarri has had a long and successful career. He has expanded our realm more than any other one man in history. He will go down in history as a valiant hero. He does not care to spoil a good record."

"Hah! You agree, then."

Twill nodded soberly. He sneered, "Valiant? Hero! Sarri, the Victorious! Eyewash. What's so glorious about conquering races that fight back with slings and spears? What's so heroic about mowing down a flight of airplanes or turning A-heads back on the senders? But now that we have come upon a race that really has space travel developed to a fine art—even though they have not exploited it much—Viggon wants to wait. He's been pushing over children. Now that he's come up against a half baked adolescent, he's afraid."

"What do you suggest?"

Twill eyed Naylo soberly. "One of us is due to succeed the great Viggon Sarri," he said flatly. "It may be you and it may be me. It will, however, be the one who decides properly how to handle this race."

"All right, then," Naylo grunted. "But it may be neither of us." He scowled. "Unless you or I can talk the venerable gentleman into action at once."

"Right. Let's get started."

Naylo grinned. "I hope you won't mind working as my second officer. Faren."

"You should see the day, Regin. I'll

have you reporting to me before we get home."

But beneath the banter was an undertone of dead seriousness. . . .

Commodore Ted Wilson eyed the search grid unhappily. Out of the center one thin hexagonal hole had been taken. It left such a lot of space to be combed.

The infrawave receiver in the Information Center was alive, and chattering with data and information and orders. Finally came a call for Wilson, from Flight Commander Hugh Weston from Castor.

"Weston here, Ted. How's it coming?"

"We've completed our first crossing. Nothing but a comet and a rather insignificant gas cloud."

"We're approaching you. Any suggestions?"

"Let's make contact and carry this out together instead of running at cross-purposes."

"Meaning?"

"No independent searching."

"I think you're wrong," said Weston. "But we can do a better job of coverage if we combine all forces into one big search."

"We could," replied Weston. "But do you realize that you'll probably leave huge holes in your search grid?"

"That's the point. I know we will. After about the fourth pass, we'll not be too sure of where we are. God, how I wish we had some method of pinpointing this absolute nothing! I wish the infrawave could be used as detecting and ranging."

"Make that double. But since we haven't got it, I suggest that we form behind you. There'll be a third quadron from Pollux as soon as Wally Wainright can get into space with his gang. I expect there'll be more, too. We'll need 'em all. Out in this featureless void, we don't really know where we are to any degree of accuracy. At least not the kind of accuracy needed to find a thing as small as a spacecraft."

"Life ring."

"Life ring, spacecraft, both God-awful!

minute when lost in a few cubic light years of space."

"I still say we should combine."

"I still think you should clean out one channel and let us take the next."

"Can't see it, Weston."

"Okay, Ted. You're running this exercise. You're the boss. We combine. We'll meet you where you are and reform before we make the return pass. Right?"

"Right, Hugh. I don't want to argue, but our master computer feels we've a better chance at the laws of probability if we all comb along the same line than if each takes a different course and we try to correlate our positions by sheer stellar astrogation."

POISED in space, Wilson and his squadron waited. While they waited, the astro-techs made star sightings and the computer mulled over their readings and delivered opinions of several probable enclosures of position. These volumes were horribly vast compared with the mote of a spacecraft. They were spherical, indicating the margin of error in precision-pinpointing their position in deep space. And as the astro-techs delivered more and more angle sightings on the known stars, the computer delivered smaller and smaller enclosures as their true position.

The problem was a matter of parallax, a matter of angular measurement against the more distant, or "fixed" stars. Now, it may seem an easy job to measure the angle of a star with respect to another star. But it must be remembered that the parallax of the nearer stars, as measured across the orbit of the earth, is a matter of seconds of arc.

Parallax is not measured directly with a protractor. It is measured by comparing the position of the star on a plate against a similar photograph taken six months ago, using the fixed stars as the frame of reference.

In deep space, position is pinpointed by solid triangulation. This can be represented by a pyramid suspended in space, the corners of which end at the

fixed stars. Take a pyramid of certain solid angles, depended by points in space, and the apex can be satisfied for only one special position. Repeat these solid-angle measurements and there are several pyramids pointing their apexes toward the true position.

But if the orbit of the Earth produces only a second or so of parallax-arc, any error in angular measurement of such magnitude produces an error of a thousand light seconds. And the greater the error in measurement, the larger is the volume of uncertain position.

This, then, was their problem. To cover, like a blanket, a volume of space so vast as completely to defy description. All that can be said of it is in comparison with a number of cubic light years. And who can grasp the fathomless distance of a light year? It is just a meaningless statement.

Eventually the second squadron came up and the ships milled around until a larger space pattern was formed. Then the two squadrons began to return along the search grid, on a line overlapping that area covered in the first pass along the computed line of flight. . . .

Alice Hemingway woke up from a fitful doze at the noise of the infrawave receiver. Charles Andrews was listening to the rapid chatter back and forth from one squadron to the next. He looked around, and when he caught her eyes, he said cheerfully, "They're really out looking for us."

"I heard," she murmured.

"Three squadrons, now. And a fourth is just heading out from Procyon. We'll be picked up—"

Jock Norton came awake with a cry. "Shut that damned thing off!" he roared.

"Why?" demanded Andrews belligerently.

"It's a waste of power."

"This thing?" sneered Andrews.

"That thing. It draws one point three kilowatts. That's plenty important for a lifeship."

"Look," suggested Andrews, "why don't we call back and have 'em pick us up?"

"Because nobody has ever found any directional quality about the infrawaves. That's why we can't use 'em for detecting, ranging, and locating. If they echoed, we might be able to use 'em somehow. But they're not even directional, let alone echoing. Not only that, but they are instantaneous in transmission, so even if they did echo they couldn't be used for ranging. So we'll not waste power howling for more help. We send a bit every hour, because we want to let 'em know we're still alive. But let's not waste any more than we have to."

Andrews shut off the infrawave receiver. "It was interesting," he said. "But I suppose we can always assume that they are on the search." He shivered. "Is it getting cold in here, or am I getting exhausted?"

NORTON smiled thinly. "Probably both. This space can isn't collecting any heat. We're too far from any sun. And there aren't enough people in it to keep it hot."

"Huh?"

"The average human puts out an average of about a thousand B.T.U. per hour over a twenty-four hour day. It rises in activity and falls with relaxing. But this can needs about five people to keep up the heat against the black body radiation from the hull."

"What do we do? Freeze?"

"One thing we can do. We can use the pedal generator."

"For what?"

"Two things. One is to charge up the energy cells. The other is that a human body in vigorous work can deliver as high as two thousand B.T.U. per hour. Although I doubt if any human body can keep up that kind of vigor for a full hour. If you're cold, you can easily warm up, Andrews."

"Why doesn't this tin can have a small pile?"

"Why doesn't a steamship lifeboat have a turbine?"

"I've seen some very small piles and generating gear."

Norton shook his head. "A lifeship is aimed at providing the maximum protection for a maximum number of people, under a minimum of luxury. Stop whining. We're still alive, I keep telling you."

"Ar," sneered Andrews, "a hundred bucks an hour."

"Are you going to argue, or do you want to try some vigor for that bad temper of yours?"

"We've got some power left over from the bank," suggested Andrews. "Let's use that."

"Not on your life. That's reserve. Sooner or later we're going to use it for radio pulses."

"Radio pulses?"

"For fine control direction-finding and locating."

Andrews snorted. "How are they going to pick up radio pulses when they're going thirty or forty parsecs an hour?"

"They use gravitic mass detectors. As soon as someone gets a register, they send one of the scouts out to drop below light and listen for radio pulses. If he hears any, then the whole search squadron stops and starts really to comb the neighborhood with radar."

Andrews shivered again. "I'll try that generator," he said. "Could we pedal enough juice to run the drivers?"

Norton laughed. "Sure. Like you could row a battleship with a rusty broom handle. Have you got the remotest idea of how far we are from anything?"

"No."

"Neither have I."

"All right. Where's your damned exercising machine?"

"Below. I'll show you. I want to cut the paragrav generator by half, anyway."

"Paragrav?"

"Pseudo gravity," said Norton crisply. "You've noticed there's still an up and down? That's it. But the damned thing radiates heat like mad, along with producing its gravitic field. I want to conserve all the heat we can. With a full complement of survivors, this space can stay more than comfortably warm. But with only three, it radiates more than is comfortable. Come on, Andrews. I'll show you this crate, too."

Alice felt the gravitic pull diminish, and then Norton was back in the main room of the lifeship. He came over and sat down beside her.

"Cold, kid?"

Alice shivered. "Just a little. Is this going to get worse?"

"Probably, but not too much. If we all exercise heavily, keep the pedal generator going, and eat heartily, we'll not fight too losing a battle against radiation."

She shivered again. Jock put a large but gentle hand on her shoulder. "Let me warm you a bit," he said softly.

ALICE looked at him cynically. "I'm not that cold," she told him. She did not move, but the tone of her voice made him remove his hand from her shoulder.

He smiled at her. "You're likely to be eventually."

"Maybe. But there are blankets, and I'm not above taking a turn on that pedal generator myself, you know."

"It's no job for a woman, Alice."

She sniffed contemptuously. "This is no place for woman or man," she said. "But I can pull my own weight, Mr. Norton."

"You're a solid character," he said.

"I've always thought so."

"This is going to get rougher, Alice. Can't we be a little more friendly?"

"Meaning what?" she snapped icily.

"Meaning only that you deserve better than that Napoleon type down there."

Alice laughed in a brittle tone. "And you're it?"

"I'll be a lot more fun."

"No doubt. And nothing but fun. What do you expect to do when the fun becomes hollow?"

"It hasn't yet."

"It will some day. You can't go on being a slightly irresponsible loafer all your life."

"Who is?"

"You are."

"Look," said Jock Norton angrily, "I'm still running this lifeship the way it's supposed to be run."

"At a hundred an hour."

"Maybe so. But let me ask you, which one of us would you rather have around right now? The trained spaceman or the captain of industry?"

"That's a fool question," said Alice. "Loaded to the gills. You know the answer to that. But once we get back home, then?"

"You're not hoping to marry that dried-up little—"

Alice laughed, almost hysterically.

"This will kill you, but until you assumed that I was sleeping with him as well as taking his dictation, I hadn't really looked upon Charles Andrews as anything but an employer. Sure, he's male. So is my Uncle Ned, my brother, and my nephew. Not to mention my father and grandfather. But Mr. Andrews is not my idea of a lover."

Jock Norton nodded soberly. He took a deep breath of satisfaction. Alice underwent a swift revision in his mental classification of her. She changed from a luxury-bought mistress to be seduced by the offer of real fun and passion into a woman with no emotional connections, to be seduced for the fun of it. Both, in Norton's mind, were fair game.

"What's wrong with me?" he asked.

"Nothing much, Jock Norton, except that you're essentially lazy."

"Lazy?"

"Lazy," she repeated. "Want it both barrels, or will you take it with sugar?"

"Hard. What's wrong with me?"

"You're educated. You know a lot. You've explained things that neither Mr. Andrews nor I had ever dreamed of, let alone understood. You know your way around spacecraft, know a lot of the basic sciences. Not that you'd ever be a scientist, but you're bright enough to grasp the idea and make it work. But what do you do about it? You jockey a spacer, instead of digging in and making it pay off. You look for the easy way out instead of working for it." Alice looked up at him sharply to see how he was taking it, and then she added, "You have the only brain present that has the mental right to stand up and direct operations. Instead, you argue and backstep."

Harshly he said. "What would you have me do—take a swing at Napoleon when he sits on those short hind legs of his and objects or demands?"

"I don't know. I'm not a spaceman, responsible for the lives of three people—at a hundred clams an hour."

"Some day I'm going to shove those humiliated fish down your throat."

"Do. And I'll spit 'em back at you!"

Norton roughly took her shoulders in his hands. He twisted her to face him, clamped down on her soft shoulders until she turned her face up to complain with welling eyes. He put his lips on hers and tried to force some warmth into them. She submitted calmly, and when he found no response and opened his eyes, she was staring at him vacantly.

Abruptly he let her go. She relaxed in the seat.

"I'm not afraid to work," he said in a hollow voice.

"Prove it," she replied flatly.

He got up, left her there, and went below.

V

WILSON sat in the Information Center and eyed the search grid glumly. It stretched stereoscopically out in the room, a lot of its vacant network of gleaming white lines frosted over with white shading, to mark where the search had covered.

There were a lot of untouched spaces—a horde, a myriad. On the side wall was a chart, showing that nine squadrons of twenty-five spacecraft each were patrolling back and forth through the uncharted wastes, seeking the space-wrecked lifeships.

The maddening part was the hourly report from both lifeships. It was like someone hiding in the dark and calling for aid, invisible and alone. And not

really calling for aid, but only making whimpering noises. For the signaling equipment on the lifeships was not equipped with the complicated infrawave phone, but only with the simple signal emitter, coded to transmit the identification call of the unit.

On the hour they came in, calling three times, "Lifeship Seventy-nine, Seventy-nine, Number Three." Number Two had not been heard from. Presumably it was not in use, or hadn't made the grade.

Wilson chewed his fingernails and fretted. Was Alice on Number One or Number Three, or was she on Number Two and it had foundered?

If she were still alive, what kind of fellow survivors were with her?

He hoped she was with a group. If she had blown out in a lifeship with only one other—well, Ted Wilson did not like the idea. Of course, it was more customary than not for a young woman to love lightly before she mated permanently. There was a lot less chance of wading into matrimony wide-eyed and ignorant of what it was all about.

But Wilson, if willing to face such transient loving at all, would have preferred that Alice have her chance to pick and choose, rather than have the matter thrust upon her in the middle of a threatening situation. The passion that comes with the shadow of death is only the instinct of racial preservation, and it mates men and women unsuited to one another during subsequent peace and quiet.

Above all, he did not want Alice to emerge from this moment of personal danger morally bound to some unsuitable mate because of a child conceived under the shadow of the sword!

Hourly, after the coded signals came in, Ted Wilson took the microphone himself and called out into space in the infrawave. He called messages of hope, and explained how many spacecraft were scouring the deep black void. He could only pray that he would be heard, that his voice would give Alice some firm foundation for hope.

He could not be sure the passengers from the wrecked spaceship, even had their receivers turned on, because infrawave receivers drink up a lot of power and lifeships are not equipped with any vast reserve. There just was not the room in a lifeship for anything more than the bare necessities of living.

The search grid was a truncated cone, and the whittled mass of finished search had finally filled the smaller end of the cone. There was the flared skirt of the cone yet to be combed, and this provided more volume than the cylinder taken out of the middle. It also provided a shorter search path as the searching spacecraft built out the volume, ring after ring around the first pass along the line of flight.

Far, far to one side a detector registered, and brought every man in the fleet to the alert. Then they relaxed unhappily again as the scooter returned with another report of a small gas cloud. Wilson thought glumly that they had discovered enough space meteors, gas clouds, and unawakened comets to make up a small star.

Then his attention was taken from his own personal troubles by the arrival of another squadron from Centaurt. He found himself busy readjusting the search pattern to accommodate this new contingent.

He eyed the pattern in the stereo and hoped it was good enough.

THERE was the basic aggregate of nine full squadrons spread out flat in a space lattice that ran back and forth from narrow end to wide end of the cone of probability. There was one full squadron of roving ships that went aimlessly back and forth across the pattern, just to cope with the happenstance factor.

One squadron was parked at either end of the search grid as space markers, with a computer ship at either end to maintain a constant check on their space coordinates. The big search pattern shuttled from one end to the other, and

if they came back to miss the marker ships, they retraced their path so that no space went uncombed.

The infrawave chattered and Space Admiral Stone was calling for Commodore Theodore Wilson.

"How're you coming?"

Wilson replied, "We're still at it, Admiral. So far we haven't seen her."

"Don't forget, Wilson, there's more lost out there than the woman you want."

Ted wanted to snap back angrily, but all he said was, "You don't mind if I take this search personally, do you, Admiral Stone? I'm not overlooking any bets, but I do admit that Miss Hemingway is a bit more important to me than any of the rest."

"No, I suppose no one could blame you for that. Just keep it up, Wilson."

"Sure," Ted said wearily. "After all, this is a black and white job I'm on. Either we'll be successful—or we won't."

"Luck."

"Spaceman's luck, Admiral."

Wilson went back to his brooding. . .

Charles Andrews came back into the salon with a brisk air. He flexed his arms, took a deep breath, and mopped his bald head with a handkerchief. He sat down beside Alice and smiled at her warmly.

"That thing is a wonder worker," he said, breathing deeply. "Nothing like exercise to make a man feel fine and fit."

Alice looked up at him with some amusement. "Mr. Andrews, tell me. Are you the kind of man who opens the window on a winter morning about six o'clock, and takes deep lungsful of icy air?"

"Not quite that bad, my dear. Not quite. But brisk living does keep a man sharp and hard. I daresay I acquitted myself well on that pedal generator despite my fifty years."

"No doubt."

Andrews chuckled. "I'll do better than our young pilot friend. The man is big, and should be muscular, but he is soft from lack of exercise. Yet he'll attempt to stay there longer than I did, I guess."

"No doubt."

He eyed her sharply, not missing her repetitious dry reply.

"Which, incidentally," he said, "gives me my first chance to speak with you alone since we took off from Earth."

"That's so. But—"

"Miss Hemingway, you are an exceedingly brisk young woman, attractive and intelligent. May I ask if you have ever taken a lover?"

"Why, no."

"Never considered it?"

She smiled ruefully. "Naturally. All women think about it. Most do. I—er—"

Alice let her voice trail away uncertainly. The direct, frontal attack had put her off balance, but she realized that this was Andrews' direct way.

He had smiled at her uncertainty, and said swiftly, "Then may I be the first—" when he noted the fading amusement in her face and glibly ad libbed—"to congratulate you on your choice of young men? The space commodore to whom you bade farewell in Chicago was an up and coming man, I'd assume."

"I rather imagine he's out here somewhere in the search group," she said.

"He may even be directing it," Andrews said carefully.

One thing he knew well—never run down a rival. It always brought on a defensive attitude. Build the rival up, and the return might be sympathetic. A clever course could be traveled between build-up and tear-down.

LOOKING at Alice thoughtfully, Andrews got up and began to rummage through a few lockers. Eventually he found a blanket and brought it to her.

"I'm not too familiar with these life cans," he told her, with a disarming smile. "I hope I remain in ignorance of them. But I found what I was after. Now, Miss Hemingway, if you'll stretch out, I'll tuck you in, and you can get

some shut-eye."

"That I can use," she said honestly.

The blanket felt good. So did his hands, smoothing out the blanket, but being carefully tender and proper. Andrews was a smooth operator of many years' experience.

Eventually she slept.

Andrews found another cigar, and smoked it languidly, his eyes roaming around the metal walls of the cabin. He was thinking that he disliked Jack Norton immensely, although he knew that chances of survival were better with Norton's boorish, interfering presence than without. He was bored, he was angry, he was above all resentful of the time wasted in this spacewreck business. . . .

An orderly tapped Commodore Wilson on the shoulder. "Message from Terra," he said.

Wilson groaned and reached for the telephone beside his bunk. "Wilson here," he said. "Go ahead!"

"Admiral Stone. Wilson, a new ship is on the way. I want you to get into this thing fully, so I'm briefing you now."

"New type of ship?"

"Well, not a new ship, but some new equipment. The Infrawave Section of the State Department Radiation Laboratory has some experimental gear they want to try in actual service."

"Experimental gear?"

"Sheer experiment, Wilson. It's supposed to be an infrawave detecting and ranging device. It's shown low grade response so far, and it may be entirely useless to you. But Radiation feels that even something incomplete and erratic may be better than going it blind."

Wilson sat up, interested. "How does it work?"

"Darned if I know. It took a whole cruiser class to carry the junk that makes it tick. It's piled in with twine and baling wire, and when the crate took off the advanced techs were still connecting cables and adjusting the guts. Er—how're you feeling?"

"Tired and frustrated."

"Mind a bad joke?"

"Well . . ."

"Go on and have a laugh, Wilson. This gizmo reminded me of the new machine that made shoes so fast that it put twelve shoemakers out of work—and it took only eighteen men to run it."

A silence ensued. Then Stone said: "Well, Wilson, I thought you'd like to know we're pouring the best we've got into space for you. Ship should be along in another hour or two."

"Yeah—thanks, Admiral Stone. And the joke was funny, at least the first time I heard it, it was. I'll get on the cubes and wait for the ship."

Wearily Commodore Ted Wilson climbed out of his bunk and began to dress. . . .

VIGGON SARRI said, "now we know more about this race. They definitely are of the class where the individual is of extreme importance to the whole. This belies both the communal, or insect type and the anarchistic, or individualistic type. The quantity of men and machinery they are pouring into this search is amazing."

"They aren't much closer to success," offered Regin Naylo. "And we're wasting time."

"You think so?"

"We both think so," Faren Twill said firmly.

"Oh?" Viggon Sarri looked at them in surprise. "Then maybe I have the wrong idea. Let me hear your suggestions."

Twill and Naylo looked at one another, fencing with their eyes. Finally Twill nodded and said. "You say it, Regin."

"It's already been said." Regin Naylo looked pointedly at Linus Brein. "A day or so ago you claimed that you'd picked up some primitive infrawave emission that looked as though someone might be trying to develop a detecting and ranging device."

"Yes."

"Then it is my contention that any

moves we make against this race should be made before anybody down there gets such a detector and ranger working."

"Why?" demanded Viggon Sarri.

Regin Naylo looked at his commander. "We're losing a technical advantage. Whether we go in with a benign and peaceful-looking air and show them how big and fast we are, or whether we plunge in and hit 'em with every battery we've got and reduce 'em to submission, we've got to do it before anybody succeeds in making an infraware space detector. Understand?"

Viggon Sarri looked from one to the other, grimly. "You believe I'm wasting time? Is that it?"

The two aides answered together, "Yes!" and "Absolutely!"

Viggon Sarri said, "I am still in command of this force. We'll continue to observe until I am satisfied. You two officers have one common idea—that of moving in fast. You have differing ideas of how we are to move in. Until you can settle your difference and provide me with a good logical basis for your decision—whichever way—then we'll follow my plan. And my plan is to move in just as soon as we have enough data on the character and strength of this race to provide us with the correct way to take them."

"Then you are going to continue stalling?" demanded Naylo.

"Yes, if you wish to call it stalling. Maybe another man might call it planning."

"We'll be just wasting time, as I've already said. We have enough stuff to take 'em right now."

Viggon Sarri shrugged. "Yes. We could swoop in and take them like mowing down a wheat field. Tell me, young men, what happens when you mow down a wheat field."

They looked at him blankly.

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Viggou smiled in a superior manner. "One of two things, depending upon how you operate. If you mow it down and let it lay, you drop seeds and next year it comes up thicker. If you mow it down, remove the seeds, sow it with salt and kill the field, you have a useless plot of land, a worthless territory. Then some day up comes weed and briar—which then must be removed root and branch before the land is plantable again. Just remember, we are after a profitable exchange of economy, not another stellar system to list as a conquest for the sake of history our children will read. I want my reward now, or next week. Having my name on a monument does not have much appeal."

He was half standing with his hands closed into fists, his knuckles on the table supporting him as he leaned forward to drive his facts home.

"Or," he added scathingly, "are you two firebrands so youthful that you don't know that a man has only one single lone chance at this business of living? And that your finest reward at eventide is knowing you have lived a full and eventful life without screwing it up somewhere along the line by making a lot of idiotic moves?"

Viggou Sarri turned on a heel and walked out.

NAYLO and Twill turned to Linus Brein.

"What do you think?" Twill asked.

Linus Brein shrugged. "He is undoubtedly right. Besides, we don't know all there is to know about the strange race out there yet."

"Oh, bugh! What else—"

Linus Brein smiled. He said slowly, "We don't even know whether or not they are oxygen-breathing."

"We can assume from the stellar type of their primaries that they are."

Linus nodded. "Probably, but not positively."

Regin Naylo said, "And what's second, Linus?"

"They may be contraterrene."

"Seetee?"

Linus Brein nodded. "In which case from both sides we must watch our steps. Get involved with a settee race the wrong way and you have two cultures with absolutely nothing in common but a life-factor, busy tossing chunks of their own kind of matter at one another in a fight to exterminate. So before either of you start making half-baked plans, you'd better get your heads together and plan something that sounds reasonable to the Big Boss. Right?"

VI

COMMODORE WILSON eyed the spacecraft full of hastily assembled instruments with a grimace. The slip was swarming with techs who were peering into oscilloscopes, watching meters, and tinkering with signal generators. A huge concave hemispherical dome above was a splatter of little flickering green pinpoints and dark patches.

"This idea is hopelessly haywire," Wilson said unhappily.

"It sure is," said Space-Tech Maury Allison. "But everything is, at first."

"You hope to make something out of it?"

"We hope," replied Allison. "We can't be sure."

"But surely this pile of junk has been tested before?"

Allison nodded.

"Any results?"

"Some. We've had as much as five minutes of constant operation out of it."

As he spoke, the hemisphere over their heads flashed a full bright green, then went black. A bell tinkled somewhere and a couple of techs dropped their tools and headed for the back room on the double. A couple of others stood up from their work and lit cigarettes because their instruments had gone dead. Some of the rest continued to nurse their particular circuits because that section was still running.

After scanning the operation to see which section had gone blooey, Allison went on. "We've never tested this outfit under anything but ideal conditions.

We've had spacecraft sent out to specified distances, fired up the gizmo and found fragments of response right where there should be a response."

"That's hardly fair, is it?" commented Wilson.

"It's a start. You have to start somewhere. Radio—know its start? The first message was sent across the ocean a few hundred years ago from one man to the other after they had made a complete plan as to time, date, location and frequency, and also the transmitted message. Sure enough, they got through. That, too, was under the ideal test conditions. So when we finally assembled the half-a-hundred separate circuits and devices that made it look as though we might have a space detector, we put up targets, aimed our equipment, and looked for a response where there should be one."

"We don't know where our target is," objected Wilson.

"And we haven't yet fired up this equipment to seek a target of unknown position and range," admitted Allison. "But this gear is better than nothing."

Again the green spots flickered in the dome over their heads.

"What do all those spots mean?" asked Wilson.

"Those are false targets, probably caused by background noise. Although the infrawave is noiseless, we still seem to be getting it. Dr. Friedrich disagrees. He claims this is not noise, but interferences. However, the good doctor is not at all certain that the so called interferences come from localized conditions within the equipment or from external sources."

Wilson shrugged. "I don't see how it's done with a radiation type that has neither a directional quality nor a velocity of propagation."

"Do you understand Accum?"

"I stopped shortly before Matrix. Accumulative Math is so much pothooks on a sheet of paper to me."

"Um. Then I'd find it hard to explain. The theory seems to be demonstrable, and the accumulative mathematics upholds the experimental evidence. But there hasn't yet been an acceptable verbal description of what happens."

"I've often wondered, leaving the nondirectional quality out of it, why we couldn't cut our emitting power and somehow compute range by observing the incoming power from a distant infra wave transmitter."

Allison shook his head. "Oddly enough, the matrix mathematics that deal with radiation shows that for any hypothetical radiation with an infinite velocity of propagation, there can be no attenuation with distance."

"Meaning that we should be able to transmit all the way from here to hell and back."

"Not exactly. Infrawave radiation comes in quanta, you know. A kilowatt covers two point one, seven nine three six plus parsecs. Two kilowatts covers twice that distance minus the ninth root of two point, seven nine three six plus. Three kilowatts covers three times two point et cetera, minus two times the ninth root." Allison shrugged and spread his hands.

"AND so on it goes," he said, "indicating that at some devilish distance—I've forgotten the figure but we had the master computer chew it out on the big machine at Radiation once—an additional kilowatt just shoves the signal coverage distance out by a micron. But if you don't put in your honest kilowatt, you don't excite the infraspace that carries infrawaves. And if you put in a kilowatt and a half, you have to dissipate the half."

Wilson grunted. "Nice to have things come out even. Who'd have dunk that the Creator wanted the Terran kilowatt to equal one quanta of infrawave distance?"

Allison laughed. "Poor argument, Commodore Wilson. Actually, the figure is point nine, eight three four plus. Close, but no cigar. We've just come to accept the figure as a kilowatt, just as for everyday calculation we accept the less refined figure of two point, one eight zer-

sees, or even two point two. At any rate—"

There was a puff of something, and a sound like the puncture of a tire. The green speckles on the dome merged with one another and became a riot of flaming green. There were shouts and cries and a lot of haphazard orders and several techs scrambled to snap toggle switches.

Down the room one of the techs went head-first into a rack with a pair of pliers and a soldering iron. He hooked one carrying a smoking little shapeless thing that had lost any character it once possessed. The tech picked up a nice, shiny new doodad from a small box and went into the rack again. When he came out this time he gave a hoarse cheer. Toggles were snapped back and the speckles reappeared.

One of the techs came up to Allison and said, "See that spot up there, sir? The one just this side of the eighty-one degree longitude circle, and a little below the forty-five latitude ring?"

"Yes."

It was a small round disc no more than an inch in diameter.

"We think that may be a response," Wilson said. "You mean a target? Possibly one of the lifeships?"

"Yes."

"I'll have a scooter go out and see. What's its special position?"

The tech took another look. "I'd say eighty one plus longitude and forty three latitude."

"From what?" demanded Wilson.

"From ship's axis, sir."

"Distance?"

"Oh, about half a parsec."

Wilson groaned. "Haven't you determined any special attitude?"

"Attitude, sir?"

"The angle of the ship's axis with respect to the stellar positions. So you've a blotch out there at half a parsec. It's an inch or so in diameter. Have one of your juniors run off some trig on the calculator and then tell me how much probable space volume that so-called response represents."

The tech thought a minute. "We've never run this gear anywhere but at Radiation, right at Mojave labs, on Earth. Our special coordinates—well, I'm afraid we—" His voice trailed away unhappily.

Wilson picked up the interphone and barked a call.

"Weston? Look, Hugh, can you get over here quick with a couple of your top astrogators? We've got a bunch of longhairs with a fancy infrawave detector and ranger, but the damned coordinates are set axially with the ship."

He listened to Hugh Weston's reply.

"Yeah," he said then. "We know where the target is with respect to the ship, but we don't know the special attitude of the ship with respect to the galactic check points. Right over? Good."

AS WILSON hung up the dome flickered, then went into a regular *flash-flash-flash* until something else came unglued and the dome went blank. There was shouting and rather heartfelt cussing, and some running around again before the dome light came back.

A tech—not the one that had come up before—moved into place alongside the commodore.

"Mr. Wilson, sir," he said, "I wonder if—er— That is, sir—er—"

"Take it easy," said Wilson, half-smiling.

"Well, sir, we've been getting a lot of interference."

Wilson looked up at the flickering dome. He merely nodded.

"Well, sir—er—I was wondering if you could issue some—er—order to have the other ships move away? I'm sure we could find those lifeships if the rest of space were clear. But you've got three hundred—"

Wilson stared the youngster down coldly. "Somewhere out there," he said sourly, "are two lifeships in which men, and a woman, are waiting for us to come and collect 'em. I'm combing space almost inch by inch. I can hardly give up my squadron for a half-finished flash in the dome like this, can I?"

"No sir—ah—I suppose not."

"Then you live with the responses tossed back by my squadron. It'll be good training for you. Er—get the hell out of my way!"

The junior tech melted out of sight and went back to his control panel.

Weston came over within the hour. Ted Wilson explained the situation and told Hugh to set up and measure the coordinates with respect to the stellar centers. Then he told him to send a space scooter out to investigate that spot.

Wilson went back to his own flagship wondering whether that fancy infrawave detector would turn out to be anything. An untried doodad. But now and then—

Wearily again, Commodore Wilson called Commander Hatch, who skippered one of the scout carriers. He told Hatch to make himself available either to Hugh Weston or Maury Allison, to investigate infrawave response targets as they saw fit.

Then Wilson hit the sack to finish his off-duty.

He dozed fitfully, but he did not sleep worth a damn. He would have been better off if he could have taken the controls of one of the spacers and gone out himself. Then, at least, he would have something to fill his mind and idle hands. . . .

Alice Hemingway awoke from a rather pleasant dream that had something to do with either ice skating or skiing, or it might have been tobogganing—the dream had faded so fast she could not be sure—to face the fact that she was feeling on the chill side.

Her blanket had slipped. She caught it around her, and in minutes felt fairly warm again. It was not so much, she thought, the actual temperature in the lifeship, but the whole damned attitude of people, and everything else that was so chilling.

The lights were running all right, and from deep below she could hear the ragged throb of the pedal generator. She wondered which of the two men was pumping it this time.

When Jock Norton came in, she knew. He was mopping his face with a towel. He looked clean and bright, freshly shaved.

She looked at him and wished she could have a hot shower herself, and a change of clothing. She wanted a ten-hour sleep in a nice soft bed with clean sheets, too, and wearing a silk-soft nightgown.

"Awake, Alice?" Norton asked brightly.

"Awake again," she said unhappily. "For . . . What is it? The ninth day?"

"Eighth," he said. "Can't go on much longer."

"I hope not."

"You look all in," he said softly. He sat down on the edge of the divan, beside her, and put a gentle hand on her shoulder. "Take it easy, m'lady. They're really scouring space for us. We'll be all right. You'll see."

UNEXPECTEDLY he bent and kissed her chastely on the forehead. Alice tensed at first, but relaxed almost immediately because the warmth of that honest affection made her feel less alone and cold, in the depths of uncharted space. Some of the worry and concern was erased, at least. She stretched warmly as he rubbed her forehead with his cheek.

Then he sat up and looked down at her. He put his hand on her cheek gently and said, "We'll be all right, kid."

"Eight days," she said in a hoarse whisper.

He nodded solemnly. "Every hour means they must be coming closer and closer. Every lonely hour means that it can't be many more, because they've covered all the places where we weren't. Follow me, Alice?"

She shook her head unhappily.

Doggedly he tried to explain. "They know that we must lie within a certain truncated conical volume of space. They comb this space bit by bit and chart it. Since the volume is known, and since it takes so many hours of work to comb a given volume, that means that at the

end of a given time all the predicted volume of space has been covered. Since we must lie within that, we are bound to be picked up before they cover the last cubic mile."

"But how long?" she breathed.

"I wouldn't know," he told her honestly. "I have no possible way of computing it. They've got the best of computers and plotters, and they've got the law of probabilities on their side. But it's dead certain we'll be found."

"I hope."

"I know," he said.

"You've changed, Jack Norton."

"Changed?"

"You looked on this as a lark, before."

"Not exactly," he objected.

"But you did."

Slowly he shook his head. "Not exactly," he repeated. "I don't think I've changed at all. I still think that when you're faced with something inevitable you might as well look at it from the more cheerful side. After all, there was the chance that we might not have made it this far, you know. Now, tell me honestly, does it make sense getting all worried-up by thinking of how horrible it would have been if we'd been caught back there when Seventy-nine blew up?"

"I suppose not."

"Well, then," he said in a semi-cheerful tone, "since we did make it out safely, and are still waiting after eight days, we might as well expect to be collected soon."

Charles Andrews said, from behind him, "At a hundred dollars an hour, Norton?"

Norton turned around angrily. "So it's six hundred clams per," he snapped back. "That's damned poor payment for having to live with the likes of you in a space can this cramped."

Andrews eyed the pilot with distaste. "Tell me," he said smoothly, "did my last effort on the pedal generator go for power storage, or for a couple of gallons of hot water for that shave and shower you've enjoyed?"

Norton stretched and stood up. "I figured that having a clean face might help morale," he said pointedly.

"You're a cheap, chiseling—"

"Easy, Andrews! Easy. There's a lady present. Besides, I might forget my easy-going nature and take a swing at you."

Andrews said sorrowfully, "Without a doubt, a man of your age and build could wipe up the lifeship with me."

Norton chuckled. "Don't count on your age being good protection, Andrews. You may push me far enough to make me forget that you're a decrepit old man who has to buy what your physique can't get you."

"Now see here!" roared Andrews.

HE WAS stopped short by Norton who took one long step forward to grasp him by the coat lapels. Andrews' face went white, because he was looking into the face of dark anger. Norton's other hand was clenched in a large, tight fist. He eyed the older man sternly for a minute, then shoved him backward to collapse in a chair.

"What are you trying to do?" sneered Norton. "Make me mad enough to clip you so you can yell 'Foul'? I know as well as you do that the law doesn't even recognize taunts and tongue-lashings as contributory to assault."

Alice got up from her couch and stood between them. "Stop it, both of you!" she cried. "Stop it!"

Norton's anger subsided. "All right," he said to Andrews. "Now that we've all had our lungs exercised, I'll go below and pedal that generator. Alice, you can have the bathroom first. Andrews, you take it with what she leaves. Is that okay?"

"Aren't you the hard-working little Boy Scout?"

"Sure." Norton grinned. "I am that." He disappeared down the ladder towards the generator room.

Andrews turned to Alice. "You're not going to go for that fancy routine, are you?" he demanded crossly.

"What routine?"

"First he uses power for hot water,

power that I was storing up. Now he's going to pedal that thing to waste more power."

Alice shrugged. "He's the spaceman," she said simply. "If he thinks we can spare the power for a bath, I could certainly use one."

"How can you trust the likes of him?"

"We've got to," she said. "We've got to."

"I wouldn't," said Andrews. "I can't."

She looked at her employer seriously. "We've both got to trust him," she said quietly. "Because, right or wrong, he is the only one who knows anything about space and what's likely to happen next."

"At a hundred an hour," Andrews said for the ninetieth time or so, scathingly.

Alice nodded soberly. "But you mustn't forget that isn't going to do him any good unless he gets us all home so that he can use it."

Reluctantly, Andrews nodded. "I suppose you're right."

Then Alice added, "And even if it weren't for the hundred per, he isn't the kind to kill himself."

Andrews granted, "No, he isn't. But Alice, I'm not at all sure that Norton knows whether he's doing the right thing or not."

She shook her head. There was no answer to that argument. Furthermore, it was the kind of unresolvable argument that could go on and on until the answer was supplied from the outside. There could be no end to it until they were either picked up safely or died in lonely space.

She decided to drop the discussion as pointless, so headed for the bathroom. A hot shower and a quick rubbing of her underclothing were on her mind. Her garments, of course, would dry instantly. She had to smile a little. To think that a hundred years ago women thought something they called nylon was wonderful because it was fairly quick-drying! Not instantaneous, of course, as was the material of which her lingerie was made.

Anyhow, getting it clean now, and having a bath herself would make her feel better. And she would be better equipped to face the nerve-grueling business of just sitting there watching the clock go around and around, with nothing to do but wait.

VII

REGIN NAYLO faced his superior with a scowl. "That rips it wide open," he said.

Viggon Sarri smiled confidently. He glanced at Linus Brein and asked, "Just how competent do you think this new thing is?"

Linus shrugged. "We've analyzed the infrawave pattern they've developed. It is obvious that this is their first prototype of an infrawave space detector. The pattern is of the primitive absorptive type, which is both inefficient as a detector and is also inclined to produce spurious responses. From our observations, their equipment must be extremely complex too. It must be loaded to the scuppers with fragile circuits and components, because the search pattern keeps breaking down, or becoming irregular. An efficient detector cannot be made of the infrawave bands until the third order of reflective response is discovered. I doubt that any research team, no matter how big, can start with the primitive absorption phase of the infrawaves and leap to the higher orders of infrawave radiation in less than a lifetime of study."

"So, gentlemen?" asked Viggon of his two sides. "Can you predict whether or not their new detector will deliver the goods?"

All looked expectantly at Linus Brein.

"We've been recalculating our probabilities at the introduction of each new phase of their behaviour," Linus Brein said seriously. "From their actions, I would say that they do not know, grasp, or perhaps even guess that space has flaws and warps in the continuum. They have been going at their search in a pat-

tern of solid geometrical precision, but have been paying no attention to those rifts, small as they are, that actually make a straight course bend aside for a distance. So due to the fact that their search pattern has already passed over one of these rifts in which the one lifeship lies, and passed beyond in their line of search, we have produced a nine-tenths probability that they will not locate this lifeship."

"And the other?" prompted Viggon Sarri, with interest.

"I'm not done with the first yet," Linus Brein said quietly. "There remains the random search group. Therein lies the eight-oughts-one positive probability."

Viggon snorted. "I call ten to the minus ten chances rather hopeless. But go on, Linus."

"The other has a sixty-forty chance," he said. "If the infrawave detector locates the space rift that lies along our coordinate three seventy-six, when the ship is near seven sixty-seven, then the scout craft will pass within magnetic detection range of the lifeship. That's a lot of 'ifs', I know, but they add up to a sixty-forty chance. I say this because space rifts tend to produce strong responses in any of the primitive detecting gear. They've certainly been busy running down space warps, which indicates that they've been getting a lot of spurious responses." He smiled. "If space were entirely clear of foreign matter and space rifts, they'd find their new detector vaguely inefficient. I—"

Viggon waved a hand to indicate he had heard enough.

"Gentlemen," he said quietly, "I've been criticized for waiting, but what one man calls study the other man calls timidity. We'll continue to wait for the final factor. Then we'll know. . . ."

THE stereo pattern in the Information Center of Commodore Ted Wilson's flagship was slowly being filled with the hazy white that indicated that these volumes had been combed carefully. As he watched, he could see how the search was progressing, and it was painfully obvious that the search was not going good at all.

The flights of spacecraft in set patterns back and forth through the stereo had covered nearly all of the truncated space cone. The random search ships were slowly cutting secondary lines through the regions already covered. There was a green sphere combing the stereo pattern now, indicating the new infrawave detector ship and its expected volume of detector coverage.

Space was filled to overflowing with the fast patter of the communications officers, using infrawave for talks between flights, and ordinary radio for talks between ships of the same flight.

Wilson had appointed Chief Communications Officer Haggerty to police the bands. Haggerty had done a fine job, removing the howling confusion and interference caused from too many calls on the same channel. But the result was still a high degree of constant call and reply and cross talk. Most of the chatter came from the infrawave detector ship, sending the scout craft flitting hither and thither on the trail of spurious responses.

It was almost impossible to grasp the extent of the operation. Only in the stereo pattern could anybody begin to follow the complex operation, and those who watched the stereo knew that their pattern was only an idealized space map of what they hoped was going on.

It was worse than combing the area of an ocean from maps that contained a neat grid of cross rules. Much worse. For the uncharted ocean is gridded with radio location finders so accurate that the position of two ships a hundred yards apart shows a hundred yards of difference in absolute position in the loran.

Some day in the distant future space would be solid-gridded with infrawave navigation signals. Then the space coordinates of any spacecraft could be found to a fine degree of precision. But now all that Wilson and his nav-techs

could do was to keep sighting the fixed stars, and from them compute their position.

This sort of space navigation was good enough to keep a ship on course, but far from precise enough to pinprick a true position. But, after all, a crude positioning in the middle of interstellar space is good enough. One literally has cubic light years to float around in. Once the spacecraft begins to approach a destination, the space positioning can be made.

Again, few spacecraft pause in midflight between stars long enough to care about their interstellar position. After all, space flight does provide a mode of travel where the destination lies within eyesight. Or rather, it has lain within eyesight ever since it became commonly accepted that these ultimate destinations were places, instead of holes poked in an inverted ceramic bowl.

Then, in the middle of the communications confusion, came a call from one of Commander Hatch's scout flights.

"Pilot Logan, Flight Eighteen, to Commander Hatch. Report."

"Hatch to Logan. Go ahead. Find something, Will?"

Will Logan said, "Solid target detected on radar, Commander. Approached and found. I am now within five thousand yards of what appears to be Lifeship One."

The entire fleet went silent, except for the detector ship, the scout craft, and Wilson's flagship.

Allison asked, "Was that our target, Logan?"

Logan replied laconically, "Nope. I was on my way back from a gas cloud—I think—when the radar got a blip."

In the background, they could hear Allison saying, "There's a real target out there where Logan went. Haven't you got an infrawave response out there somewhere—" The mike clicked off. Allison probably had remembered that he had his thumb on the "Talk" button and removed it.

CAPTAIN WARREN said to Wilson, "That's a hell of a fine space detector, isn't it?"

Wilson nodded absently, picked up his own handset and called, "Logan from Wilson. How close are you now?"

"Thousand yards, Commodore. And no doubt about it. Lifeship Number One."

"You stay on, Logan, and give us a rundown."

"Yes, sir. Not much to tell, you know. But I'm closing in."

The scout craft pilot went on and on, mostly filling in with inconsequential details of how he was closing in, jockeying to parallel the lifeship's course and speed, and finally making a space approach.

At last he said, "They're on radio, Commodore Wilson. I'll relay as I get it. Too bad those crates aren't fixed to patch cord the short range radio to the infrawave. I—" Pilot Logan went on to rattle off the names of the men aboard the lifeship, stopping once to reconfirm a pronunciation.

"Where's the pilot, and the other two? Miss Hemingway and Mr. Andrews?"

"They must be in Lifeship Three," said Logan. "That's a guess. Er—Commodore Wilson, I'm within a couple of hundred yards of them now and they're waving out through the astrodome at me. I'm about to toss out a light bomb. Or has anybody got a radar fix on me?"

"Better toss out the light-bomb. Also radiate radio on the finding frequency. Hatch!"

"Hatch here."

"Hatch, send out a cruiser class chataway and pick 'em up."

Hatch laughed in a brittle tone. "It's been on its way for six minutes, Commodore. Half of our job is done!"

Wilson said, "Good!" and closed his mike. Half of the job was done, but it was, as far as Ted Wilson was concerned, the lesser half. He wanted the lifeship that sheltered Alice Hemingway.

Three hundred ships combing the spaceways with magnetic detectors and radar and eyesight. One ship combing God-knows-what with a half-cooked interweave gizmo in which nobody had any confidence. One half of the job done on what was as much a fluke of luck as good management.

And out there in the awful dark Alice was trapped in a space can with a happy-go-lucky hulk of a pilot who lacked the drive and ambition to buck for his own command, no matter how deeply mortgaged, and a small, wiry ruler of industry who bought what he could not command, and knew no more about spacing than Aunt Agatha's pet Siamese tomcat.

Wilson laughed bitterly. A-spacing she had wanted. Now she had it.

Pictures went through Wilson's mind. A picture of Charles Andrews comforting Alice by the force of his personal drive, confident that money could buy anything, including rescue from space. Andrews calming her fears and—it must be chill in the lifeship by now—bringing her the animal comfort of warmth, and offering to take care of her. His wispy arms about her, his fumy hands caressing her as he held her head on his shoulder, his—

This picture was replaced by the vision of big indolent collar-ad Pilot Jock Norton. He would be taking over because he alone in that lifeship knew what spacing was all about. Mentally, Wilson could see Andrews a little hysterical because the financier was out of his element, and Norton taking over completely. Maybe Andrews had succumbed to some nervous affliction because of the strain.

Norton would be rubbing Alice's feats and confidently predicting rescue, and preparing that they combine the interrelated factors of the conservation of heat and the passage of time by indulging in exploratory dalliance. Wilson could even envision Alice, not entirely convinced that they would ever be rescued, agreeing because she would be unwilling to die without having reached the pinnacle of emotion.

That picture was even more distasteful, but it was replaced by another in which Charles Andrews was making the gesture. Where Norton had youth and masculine appeal, Andrews had the suave manner and the smooth experience of his years. Some fast talk and a few vague promises, to say nothing of some well-calculated suggestions, and Alice would—

WILSON tried to shut that notion out of his mind, but it went on and on and on.

And on.

Only one thing made this series of pictures bearable at all. Thank God Alice was aboard that lifeship with two men instead of one. Especially two men who could not help but find one another deficient in something or other.

Then the third or fourth vision came. Norton and Andrews might possibly, due to their precarious position, settle their differences in basic nature and come to an agreement.

They might be taking turns!

Ted Wilson gritted his teeth and tried to get deeply interested in the search grid.

It was nine days old. . . .

Alice looked up with a startled expression as Jock Norton came through the ladder hatch into the central cabin of the lifeship.

"But isn't—ah—aren't you—" She let her voice trail away because she didn't quite know how to finish.

He laughed. "I put enough reserve in the tank to take care of the elderly Napoleon. Look, Alice, I want to talk to you without his gulf on the side."

"About what?" she asked. "Or shouldn't I ask?" The recent shower and rubbing of her underclothing had given the girl a feeling of confidence.

"About me. You. You and I. Us, you know."

"What can I say?"

He blurted, "What the hell's wrong with me?"

"Why, I—"

"Nuts," he snapped. "I'm not asking you for an explanation."

"Then why put it that way?"

"That's the point," he said. "I don't know. Something's all wrong inside."

"How?"

"Napoleon. Andrews. Frankly, I hate his damn guts. I've always hated the guts of that kind of moneybags. He walks all over everybody, buying what he can't control. Damned near theft, if you ask me."

"So?"

"Aw, hell! The little character has got something. I want to know what."

"Now it's him?"

Norton nodded. "Something about Andrews. I don't know. I don't know how or what or why, but there's something about him."

Alice eyed the pilot strangely. "Good or bad?" she asked cautiously.

"Both."

"Jock Norton," she asked quietly, "you've never had to work hard to get what you wanted, have you?"

He stared down at his fingernails. "Maybe that's because I never wanted anything of real value."

"Maybe," she agreed. "But what have you wanted?"

"Damned little out of life," he answered her truthfully. "Fun and games, mostly."

"And I suppose they came easy?"

He nodded. "Being a space pilot has, well, a certain egoboo. You find yourself invited here and there by people who have never been any farther out of new York than Hackensack, or maybe no farther out of Chicago than Evanston." He looked down at his fingernails again. "There's always women happy to claim they've slept with a man who has been to Castor, or Pollux, or Polaris, or even Centauri. A man gets his bed and breakfast and his fun. But—" Abashed, he let it trail off.

"So what about Mr. Andrews?" she prompted.

"He's been there, too. But his—well, somehow I think—"

Alice smiled quietly. "In other words, Mr. Andrews' spacing is only a means to his own advantage instead of being the end itself?"

"I guess that's what I mean. Andrews doesn't use spacing as his business. He uses it to get to his business."

"That's right."

"So where do I go from here?"

"That's your decision."

"I know. And I wish I knew how to make it."

SHE smiled at him sympathetically. "I wish I could help."

"Maybe you could."

She looked at him cryptically. "Not Alice Hemingway. I've got me a man out there who is combing space for all three of us. You'll have to make your own life and find your own girl."

"Suppose he doesn't find us?" he asked bluntly.

"Then," said Alice soberly, "we have no future to concern us, no decision to make, and no failure to measure up to or to account for to anybody."

"And we'll have died without having really lived?"

"Most everybody does. Few are content to lie down and get it over with. One lifetime is not long enough to content one's self. No alert, willing, intelligent human being can be content with *Thanatopsis*."

"I don't know it."

"I don't know it too well, either. Something about, 'When thy summons comes to join the innumerable caravan that moves, et cetera, like one who wraps the draperies of his couch about him and lies down to pleasant dreams.' Or something like that."

Bluntly he said, "It's nine days."

From the top of the ladder, Charles Andrews repeated his familiar refrain, "Nine days at a hundred per hour."

Norton turned swiftly. "Yeah," he drawled. "But we'll have that argument later, Andrews. Right now it's time to blast out with a distress signal again. They've got to know we're still alive, no matter what else."

"Okay—okay."

"So you fire up the infrawave transmitter and I'll pedal the generator, as before."

Norton disappeared below. Andrews went to the small panel and sat there watching the one meter, his hand resting on the one switch.

"Hell of a note," he grumbled.

Alice asked, "Why?"

"Can't send a damned message on this. Only make an identification call."

Considering the size of this lifeship, and the fact that an identification call is all that is really necessary, I can't complain too much," she told him seriously. "What could you tell them that they don't know already? Could you urge them to greater haste by the power of your voice?"

Andrews actually had been thinking exactly that. Between the checkbook in his wallet and the pen in his pocket, Andrews had always been able to wield a lot of power. Men had jumped when he spoke, corporations had stopped their own programs at his signature.

His personal account would have covered the purchase of a spacecraft of the type in which they had cracked up. That he did not own his own interstellar runabout was a matter of a different economy. It was cheaper to buy passage as he needed it than it was to own his private spacer and keep it parked at some space port for his convenience.

But as Alice taunted him, Andrews could not say, aloud, that he believed his personal demand would bring help faster than the mere knowledge that human beings were adrift in space. It would sound as though he thought himself more important to the Universe than Alice or Jock Norton. He did think so, of course. But this was no time to insult his lifeship companions by saying so.

He eyed the switch distastefully. The meter was climbing up to the red line that meant that the infrawave transmitter was about ready to be turned on. Then it would hurl out its coded message.

In the back of his mind was a hazy recollection of radio code. He remembered that 'a' was a dot-dash, and that 'n' was a dash-dot. He did not recall whether 'd' was a dash-dot-dot or a dash-dash-dot. 'r' was dot-dash-dot and everybody knew that 'e' was a single dot. The letter 'w' baffled him completely but he was sure that 's' was dot-dot-dot. So the worst he could do would be to flub two of the letters in his name, making it come out A-N-D?-R-E- something-S

THAT, he felt, would let the Universe know that he was still out there, drifting. The ragged codes might even cause them to hasten because they might believe him to be alone, or without the help of the pilot who probably knew code well.

The meter hit the red line.

Charles Andrews snapped the goggle switch up and down, then up-pause-down. He waited a second, then made it up-pause-down, then up-down. He started the 'D' but his faltering hand flipped the second dot in a jittery fashion.

Down in the guts of the infrawave transmitter was a code wheel, supposed to turn completely around for one revolution. Along the periphery of the wheel was a series of serrations, which in passing a fast-action switch keyed the output of the simple transmitter, sending the stylized code. The jittery flipping of the main switch coincided with one of the serrations on the code wheel so that Andrews turned off the whole gear just as the transmitter was keyed on. The power normally used for the energizing section, stored in local capacitor banks, discharged through the output section.

It was not spectacular. The meter just flopped back to zero, a fuse blew, and the cabin was filled with the pungent odor of burned insulation.

Below, in the pedal generator saddle, Jock Norton felt the load bucking, then it went off completely and reflex almost threw the pilot out of his seat. The

pedals pumped with no resistance. He went aloft.

"What happened?" he asked.

He sniffed at the air as Andrews pointed to the meter.

"It shouldn't happen," said Norton. "What made the thing buck, Andrews?"

Andrews was not the kind of man who hides his errors, at least. He faced Norton and said, "I was keying the transmitter."

Norton growled, "Did it ever occur to you that if this gizmo could be keyed, it would have been made that way in the first place?"

"No. I assumed that the thing was made to be handled by people not familiar with code, and that if one knew code one could key it."

Norton growled again, "Ever think that I know code, and that if it could have been keyed, I'd have done it before this?"

"Now that you say it, I suppose you would have. But what do we do now?"

"We try to repair it," snapped Norton. "Do you want to try it all by yourself, or will you permit me to help?"

Alice got between them once more. "Get it fixed first," she said sensibly. "Then argue about it afterwards."

Norton nodded, but he was not happy about it.

VIII

IT WAS finished.

Commodore Theodore Wilson eyed the stereo grid with distaste. The filmy white haze, marking off the volumes already combed, filled the grid completely and overlapped the enclosing lines.

The pattern search had been most thorough. The random search teams had cut curlicues and looping curves back and forth through the grid. Their coverage had not been perfect, by far, but it was good enough for a random search. The volume covered by the infrawave detector spacer was sporty, but adequate.

The equipment was still breaking down every five or ten minutes, still delivering a horde of spurious responses. Scoutships still were being sent scurrying back and forth to investigate.

He faced the grid unhappily. He was gaunt from lack of sleep, from hastily snatched meals, or meals missed completely, from chain smoking, from watching what had started as a chance to make a good mark turn into drab failure. Worse, a failure that in no man's mind could be blamed upon Ted Wilson. For he had found one lifeship, and the finke would be forgotten.

So would his failure. By every man but Wilson.

Somewhere back in that vast black volume of nothing, outlined by imperfect mathematical concepts in a larger field of nothing, was a lifeship, lost. A tiny cold mote of iron twenty-odd feet tall and nine feet in diameter across its widest point.

Wilson tried to draw his mind from it, but could not. Hysteria crept in but was quickly subdued.

In his mind he saw her as he had last seen her, pert and happy, with her light spacebag on the floor of the waiting room beside her slender ankles. He saw her before him, taut with thrill and excitement, vibrant and alive. He remembered her parting kiss, and the warmth of her body pressed against him.

Alice had been filled with anticipation, wanting to share her excitement with him, but unable to share what was a brand-new experience to her of going to space with a man who had been spacing for years. A man who knew all too well how space could be boring, lonely, and incredibly monotonous.

Not like travel across land, where there is scenery to watch, and although a tree is a tree, no two trees are are ever alike, just as no one mountain ever looks the same at two o'clock in the morning as it had four hours earlier at ten in the evening.

Not even like travel on water, across the broad ocean where the scenery is

water, whipped into waves of some similarity. For no two waves are ever the same exactly, and there is always the chance of a whitecap or a surfacing fish. The motion of the waves is incessant, at some times as soothing to the nerves as a lullaby.

But space was always the same. Across the galactic reaches covered by Man so far, there is little change in the aspect of the sky. A nearby star here or there is misplaced, but by and large the sky looks the same from Terra as it does from any planet or any star within fifty light years.

Move a man from Sol to Sirius, and Canis Major loses a bright star and changes shape to a degree not noticed by any but a trained stenographer. Ophiuchus gains another unimportant star that no one would care much about.

But then, Alice had been thrilled from the center of her heart to the flush on her skin with the idea of taking to space at last, so that she could at least begin to grasp the immensity and the mystery that he had failed to bring to her through talk.

Well, Alice Hemingway was getting her young tummy full of space!

He was still swearing under his breath when the men came in to ask him what they should do next.

He eyed them sourly. Manning, Edwards and Wainwright of his own ship. Hatch, Weston, Allison; then others Wilson knew only by reputation and name — Morganstern, Cunningham, Wilkes, Thordarson, Moore, Sillowski, Themes, and Calcaterra.

THEY watched him quietly, knowing what he must be feeling. They wanted orders, either to continue this fruitless search or to abandon it. But not one of them wanted to be the first to speak.

Finally Wilson singled out Toby Manning, the computer.

"Well?" he snapped.

Manning shrugged. "Tell me what to do next and I'll do it," he said defensively.

Wilson exploded. "You know your job! Suppose you tell us all how three hundred ships could comb space and miss anything bigger than a hard-boiled egg."

Toby Manning started to open his mouth to say something. He was not at all sure what he should say, not at all sure what was wise to say, but he knew he was expected to say something. It was as well for Manning that he felt indecision, for if he had uttered a syllable it would have been blasted back down his throat.

"Space search!" roared Wilson angrily. "Integrated maneuvers! We might as well be a bunch of crying children, lost, and scrambling all over a department store trying to get ourselves located. Sure I know there are indeterminates. I know there's always trouble with space coordinates. Sure, it ain't like plowing a farm where you can follow the edge of where you've been last. But you, Manning, are supposed to be a computer, capable of plowing with the Law of Probabilities which, my math prof once told me, should include the probability that human beings will make errors and be generally sloppy. You set up the search grid and proposed the search pattern with what you called a factor of overlap safety."

Wilson turned on Hugh Weston. "And you are supposed to have a bunch of the finest astrogators in the Universe! You and your collection of schoolboys, confidently walking behind the stereo and drawing pinpoints and hairlines to show where we've been! Nuts. You should have used a ten-inch kalsomine brush."

He paused for breath as he scorned them with his eyes, then picked Allison.

"That fancy doodad of yours, Allison —the famous infrawave detector and ranger! Did you ever get more than ten minutes of constant operation out of it?"

"Once," Allison snapped angrily, his face red and his hands opening and closing.

"Fine," sneered Wilson. "Oh, fine. Oh, hell!"

He looked at them all again. He saw them, this time.

"All right," he said contritely. "I've been off base. I'm wrong. Manning, what are the probabilities for error in the grid itself?"

"Commodore, nothing can be perfect. We had to approximate their position, we had to guess their speed. But we did put our search area out beyond the region where their chances ended. If they do lie outside of the volume of space searched, their position lies under a nine-nines figure against the computation. I may sound like I'm talking gibberish, but that's it. No man can make a perfect sampling cross section unless he samples every item. I would stake my uniform on the probability that the lifeship lies within the volume outlined on our grid."

"Yes." Wilson nodded. "Weston, can you add anything? I chewed you out, too, and now I want to back down and ask your honest opinion."

Hugh Weston shrugged. "We're far from perfect ourselves," he said quietly. "I'll put it this way. I gave strict orders to the men in the marker ships that if there was any remote chance they might drift, they were to overcompensate. In other words, running a channel through space back and forth leaves a man lost himself, as to his exact position. I had men marking the courses. Each run through the grid covered a cylindrical volume. If there were a chance for any cylindrical coverage to miss its neighbor, leaving a hole in the grid, my men were to move in and see to it that these errors were closed. But I repeat, we're not perfect."

WILSON said contritely, "Allison, I owe you the most. You snapped me out of it. Maybe I owe you the least for bringing that damned gizmo out here and tying up Hatch's entire fleet of scout craft? But Hatch would have been sitting quiet anyway, as it turned out. Anything to add?"

"Nope," said Allison, with a shake of his head. "We know the infrawave detector is no polished instrument. We're fumbling in the dark. But there was that possible chance that the detector might have worked in deep space where it hadn't worked in the interference field of a planetary system. We hardly know what makes the infrawaves radiate, let alone how they propagate. But we tried. Just as you tried. We failed."

"Just as I failed," said Wilson bitterly.

"Not completely," said Commander Hatch. "We did catch one of them."

"Batting fifty per cent. One hit and one miss."

"Stop beating yourself, Wilson."

"Beating myself? I—" He stopped, then spoke to Manning. "What are their chances of being in the same general region as that other lifeship?"

Manning said to Weston, "You answer that."

Weston shook his head. "We have no way of knowing whether the rescued ship left the murdered spacecraft before or after the last one. Nor at what celestial angle. Nor at what speed. Okay?"

Manning nodded, then added to Wilson. "The answer to that, Commodore, is that the position of the rescued lifeship has no bearing on the lost one. Just as the turn of heads in a toss has any effect upon the turn of the next toss."

Wilson nodded unhappily. "And so we sit here and talk it to death."

"What more can we do?"

"We can start over again."

"Is that an order?" asked Hatch.

Manning shook his head almost imperceptably. Wilson caught the faint objection and said. "Wait a moment. Toby, what have you got in mind?"

"If we start over again," Manning said soberly, "I'll have to reconstruct the grid. Because by the time we've covered the grid, they'll have had time to pass outside of the present realm."

Wilson thought this over. "Why," he asked generally, "don't we start on the outside and close in?"

Manning answered, "Because in starting on the inside we have the best mathematical chance of finding them

By starting on the outside, we must cover a vast cylinder, element by element, working in the direction opposite to theirs. No, that's not the right way to do it, Commodore."

"All right. Reconstruct your new grid, Toby. Hugh, get your gang together and compute the center line of the pattern within a half inch. Morgunstern, you've got a good crew of advanced techs. Turn 'em all over to Allison. Allison, pack enough men aboard that cranky crate of yours so that any part that blows can be replaced within ten seconds. I want uninterrupted operation, even though the thing only hands us spurious responses.

"Hatch, put half of your gang in with the random search team. No use using all of you to run down gas clouds and meteorites and places where there should be something the size of a planet but isn't. Yes, we'll start all over. And this time, Hugh, give us fifty per cent overlap, and get busy with Toby to compute the new grid on that basis. Can we do it?"

They looked at him. Some wearily, who saw him more weary than they. Some angrily, but Wilson was beyond honest anger himself. Some anxiously, who knew that Ted Wilson had lost more out in that black nothingness than a reputation, or a mark on his record. Some looked at him willingly. They were all with him, tired, angry, expectant, but all willing.

Weston growled, "We'll find 'em, damn it."

THE room rumbled with growls. They were not schoolboys, thrilled with the adventure or given to demonstration, nor youths driven to the job of combing the unknown for their commodore's lost love. But they felt it inside and stifled it in low-voiced growls because they were not much given to bragging, either.

And Ted Wilson knew that if the lost liveship was to be found, his command would find it.

Wilson's communications officer came in quietly. He caught his commodore's eye and motioned Wilson aside.

"Commodore," he said, "something I'm not quite sure about."

"Yes?"

"The hourly infrawave distress call?"

"Yes, of course. It's time for it." Wilson looked at the man's face and knew that something was wrong. "It came in, didn't it?" When the communications officer didn't speak, Wilson cried hoarsely, "It came in?"

The com-tech nodded slowly. "It started, but it was sputtering badly. Then it conked out cold, Commodore. Nothing like I've ever heard before."

"Like what?"

"Well, you know the code wheel runs in standard communications code, giving the spacecraft license, the liveship number, and the general distress call, repeated over and over for three minutes. Well, sir, the license identification came through all right, but after that the code got awful garbled and spotty, and then the whole damned transmission just crapped out, sir. After about a half-minute."

"Fade?" asked Wilson in a strained voice.

"Went out like a blown fuse. Bit blast, then silence. Nothing."

Wilson thought for a moment, then looked around. "Anybody have an idea?"

Allison scratched his head. "You say the code was all right, but then got spotty?"

"Yes, sir."

Allison looked at Manning. Both were involved in science to a high degree. Allison as an infrawave researcher; Manning as a computer. Both had studied the mathematics of communication. Manning nodded soberly.

"You don't suppose they foolishly tried to key the automatic transmitter?" he asked. "Superimposing a code upon another code would result in a spotty transmission, since the intermingled transmission bits would obtain only where both codings delivered a positive configuration. It might—"

The communications tech broke in scornfully, "The pilot of the Seventy-nine was aboard. He'd know. Nobody but a complete imbecile would try to key an automatic distress transmitter."

Allison nodded positively. "Can't be it."

Commander Hatch looked down at his feet. "I was in a space can once," he said. "They don't last forever. I—" He let his voice trail away.

Wilson looked into their faces. The cold, bleak fact was so clear in their faces that he could not ignore it. He was forced to recognize the fact that a lifeship is no spacecraft. A lifeship is a flimsy tin can, as spaceworthy as an open raft on the broad ocean, as spaceworthy as an umbrella in a windstorm. A lifeship was not intended for comfort, or for travel, or for use. It was aimed at a hope and a prayer that if the mother spacecraft came a cropper that human lives could be protected for a time, long enough to give hope of rescue.

In the faces of the men had been determination. Now the determination had faded. Left was only sorrow and resignation.

Wilson had lost.

Doggedly he said, "We'll loaf it out for the next hour. We'll go on as though this hadn't happened. We'll prepare for a recoverage of the grid."

They all nodded and left, but the step of each had lost its spring, and voices had lowered to funeral rumbles. Some even whispered.

COMMODORE WILSON swore at the closed door.

The hour passed with the slow interminable drag of eternity itself. It was the complete uncertainty of the result, the angering fact that not a single thing could be done until that hour had passed, and even then there was a high possibility that nothing could be done at all. So long as the hourly signal came in, there had been solid knowledge of the survival of the lost party.

This had been a sort of haphazard thing. There had been times before when a lifeship party had missed sending the signal because of fatigue, and had finally sent their signal late. Suggestions were always cropping up that the signal be entirely automatic, clock-timed. These ideas were claimed to be impractical since a timed, automatic signal only meant that the lifeship itself was still lost in space, and not that any aboard it were alive.

A full, two-way infrawave system would have been the answer; if a full two-way system could have been installed in a lifeship, still leaving room in the little space can for things essential to the sustenance of human life.

Ocean lifecraft are equipped with hooks and lines for catching fish, with gizmos for making water from the salt ocean drinkable. Air is free. Waste products are cast overboard.

In space there are no fish to catch, no salt ocean to purify, no air but that within the tiny can and its high-pressure air flasks. There is a supply of water and a small refining plant to distill waste products, not at all efficient, but adequate for a few days. But the bulk of the food and water and all of the air necessary to maintain life filled up a large percentage of the small volume of a lifeship.

Slowly, that nerve-grinding hour passed, and then it became an hour and a half. Then it was two hours, then two and a half. Then three hours.

No signal . . .

Andrews looked askance at Norton. "Nothing we can do?" he asked quietly.

Norton shook his head. "Nothing I can do," he said helplessly.

"But there must be something."

"There probably is," Norton said simply. "If I were a trained com-tech, I could probably fake something together and make some fudged-up repair that would at least radiate. But I'm a pilot, so I don't know all the angles of infrawave equipment. Not even basic theory. I know enough with the aid of this repair manual to replace any part that might have failed. But beyond that—"

Andrews shook his head and scratched his nose. "I can't see it," he said.

"See what?"

"I can't see how a man can claim the ability to make a repair on a complicated thing like this without knowing more than you say you know."

Norton smiled thinly. "I can replace the plumbing under a sink, too," he said flatly, "without knowing enough to make me a licensed plumber. This manual gives full directions, but no reasons. If the voltage at this terminal is less than thirty-six hundred, then check the voltages on terminals so-and-so, measure the resistance between terminals this and that with the equipment off, connect terminal A to terminal B, and check the alternating voltage across Component Two-nineteen. Depending upon what we find that does not follow the book, we locate the busted doodad and replace it. But the damned book doesn't bother to tell you why the voltage across such-and-such terminals should be thirty-six hundred, or what happens when it isn't. The book was not written for infrawave engineers. It was written for guys like me who care more to get a signal on the infrawave bands than we care for the theory of operation."

"All right, then. So we blew something. Can't we run it down?"

"Trouble is that we blew too many things at the same time."

"Don't understand."

"Naturally," snapped the pilot. "You know less about this stuff than I do. This is supposed to be more than thirty-six hundred, providing that is functioning. But the voltage will go above seven thousand if the other has even misfired. If you blow both items together, the voltage downed by one and upped by the other comes out to about four thousand. The reading may be all right, but when everything in the damned set reads wrong, I have to give up."

"So what do we do now?"

Norton shrugged. "We hope they don't give up. We keep on working on this thing. We—Hell, we might as well turn on the receiver and listen."

"Can we spare the power?"

Norton looked at the fuse-box. "Might as well," he said. "We might as well. If they abandon this search because we aren't transmitting, we might as well waste the power anyway. . . ."

VIGGON SARRI faced his lieutenants. "From Brein's report" he announced, "they finished their grid search some three hours ago, and have been milling around in stacked pattern ever since. Linus predicts that they have been waiting for a recurrence of the regularly transmitted signal that should have kept coming but which blew out from some sort of overload. Within the half-hour, they have reformed their search pattern and seem inclined to continue, even though it should appear obvious to them that their friends have lost their ability to transmit."

Regin Naylo looked puzzled. "Could it be that they've discovered how to tell when an infrawave receiver is being used?"

Faren Twill shook his head. "If they knew that they'd have developed a more efficient infrawave detector."

Linus Brein agreed vigorously.

Viggon Sarri seated himself self-confidently. "Gentlemen, you have before you a race with dogged determination, the grit and will to go on, even though they have tasted failure."

"Right," said Faren Twill.

"So now I know," said Viggon. "And now we go in!"

Regin Naylo looked hopeful. "To let 'em have it?" His face fell. "Or to make friends of them?"

Faren Twill started to speak, but Viggon silenced him with a wave of his multi-flexed hand as he went on. "We go in prepared for anything. Naylo, you will, as usual, set up our forces for battle. That means an all-man alert at all stations. Complete alert, Naylo."

Naylo nodded.

"With one exception. No attempt to clear the store charge in the projectors with a preliminary blast."

"But look, sir—"

"You'll issue instructions to your beam officers to set their beams for the

trial blast, but not to clear them."

"Might'n't that be dangerous?"

"It might. But the clearing blast can come before we strike—if we have to strike. I doubt that the wait will be disastrous, Regin. After all, they seem to have no armaments worthy of the name. And firing a few thousand megnoid beams, even at test power, cuts up some awful didoes in space."

"So?" sneered Naylo.

"Aside from scaring the armor off of them, it also kills a certain element I demand. At any rate, those are your orders. You, Faren Twill, will take charge of the maneuvers, setting up the fleet in battle formation and instructing each ship captain to be prepared for any maneuver, however unorthodox. Both of you are to maintain constant personal contact with me, for my orders may change by the minute. Linus, you had better clear your logic computer of all problems, but retain the information we have stored regarding this race. Be prepared to accept any information that may come from our next act. Understand?"

They all nodded.

"All right. Then as soon as each of you is ready for further orders, report. At that time we are going in!"

X

EYES on the speaker grille as if they could force it into life by the power of their minds and attention, they sat in the little lifeship cabin in deathly silence. Their utter helplessness was apparent to all three of them, but their grasp of that fact took different trends.

Charles Andrews was angry and frightened. Had he been able to transmit his blocked-off communication he would have roared in anger, rajoled, threatened, accused the rest of the Universe of incompetency, then offered large rewards. But perhaps for the first time in his life Charles Andrews was in the awkard position of having no channel of communication with those who might do his bidding. Therefore he was as frightened as a musician who is told he must lose his hands, the use of which give him his only opportunity to pour out his inner feelings.

Jock Norton was stunned. Because he had looked upon this affair as a sort of lark. Others had come through space-wreck safely and he should, too. Because now he had been forced to realize that this incredible thing was happening to him. Juggernaut was about to roll over him, and there was nothing he could do about it.

A couple of the others who had come through safely had gained some fame and fortune by writing their memoirs, and taking their short strut upon the stage of Public Curiosity. But the game had turned bitter, and now Jock Norton was wondering if it might not be better to get it over with as quickly and painlessly as possible—except that Jock Norton was afraid to face death with the same calm, casual attitude with which he had always faced life. But life had been fun, while death . . . Who knew?

Alice Hemingway was frightened almost into shock. She was holding fast to a blind hope, the same hope on which many a shipwrecked and space-wrecked victim has clung when the searching party passes at a distance and goes on, and the mind keeps crying that surely someone will turn and see. And screams become hoarse because all reason and logic have fled, and there is no way for the mind to realize that no voice could be heard across the thunder of waves or across the gulf of space.

Alice also had blind faith in her lover. He could not fail; he would not permit himself to fail. She would not face the possibility that though Ted Wilson would do his best, that his fine crew, and the equally fine crews of the other commanders would do their best, that best was not enough.

So far, no one had mentioned the fact that Charles Andrews had wrecked their code transmitter. One does not kick a dog for ignorance, nor lay blame for technical incompetence upon a financier. An error is an error, and the other two victims knew that Andrews felt the

weight of the error he had made as heavily as they did. But there it was, and sooner or later it would probably break through, and come out stark and vital.

Then the infrawave receiver chattered into life.

"All right," said the voice of Commodore Wilson. "We have our plans. We'll assume that they've had a technical breakdown and cannot transmit. But until we find that lost lifeship, and the three of them in it, dead or alive, we'll keep on combing space! Are you with me?"

The infrawave yammered with a chorus of affirmatives.

Andrews took a deep breath.

Norton relaxed and lit a cigarette.

Alice looked around the cabin wildly and cried, "Ted! Ted! You can't fail us now!"

They sat there in their little lifeship cabin, cold and frightened, and they listened to the chatter going on across space from ship to ship and an occasional call to Base. Hope waxed and waned: they were as lost as any human being has ever been lost.

Yet somewhere out there men were searching for them. They could be light years distant; they might even be going in the other direction. But it could be just the minute after the next when a wild happy yell would burst from the infrawave receiver to inform the known Universe that the lost had been found!

And so they waited—and hoped. . . .

COMMANDER HATCH, tired of inactivity, was loafing along out deep in space on the trail of a clustered group of the infrawave detector's improbable findings. But this time it was not a spurious response he got.

He flicked past Viggon Sarri's flagship at no more than a half-mile distance and blinked at what he saw, hoping to scan it more closely on the image that his eye retained. The big flagship had come out of the black in a flash, and a fluid line of sparkling lights, had blasted into size, and had been behind him in another flick. It left only that flowing image on Hatch's retina, but that was enough.

"That," he said aloud in his one-man ship, "was a spacecraft! And *big*!"

Hatch flipped his flitter end for end and set the blast. It brought him to a slowdown by the time he came abreast of the second wave of Viggon Sarri's space force.

To one side was a monster, sleek and dangerous-looking, its turrets flat and ugly-snouted. Above him was another, more distant, but no less angry-looking. Before him was a fighter carrier, its skeleton deckworks crammed with fleet hornets of space; their stingers fixed forward, looking out of the carrier at every angle.

Small, ineffective drive flares indicated that their crews were alert, though idling, and that their working guts were hot and ready to arrow into space. Before was another of the vast battle wagons, its projector snouts uncovered. One of the turrets made a swift turn, a lift of the projectors, a lowering and complete swivel. Then another started the warm-up maneuver.

Hatch's scouteraft passed on. On through the front line of ultra-heavies to the lighter, faster classes of spacecraft behind the front array. Jaw slack, he pressed his eyes against the binocular scope, straining to see the flat-extent of each formation. But they faded off into the depths of space and he could not see the end of them.

He passed another carrier and watched the first flight of fighters whip out from the skeleton deck in a flat circle, to turn upward along the axis of the carrier and disappear forward toward the spearhead of the force. They looped around after awhile and came back to the carrier after their test flight.

Everywhere Hatch saw the ugly snouts of projectors lifting and turning in their turrets.

He broke out in a cold sweat. Hatch was as frightened a man as ever existed.

He was a commander in the Space Force, a body trained for combat. But

the Space Force, for obvious reasons, was not trained in combat. Aside from having to contend with an attempt at space piracy, some more frequent attempts at barratry, theft, and other forms of skullduggery, and very frequent smuggling, the Space Force was not armed against opposition.

They had their arms, and their ships were efficient. But for the lack of an active enemy, the Space Force was not a pampered service, handed money for the development of heavy space ordnance. There had always been the unexpected "Maybe, some day," but to date no one had ever come up with any proof that Humankind did not represent the only sentient animal in the aggregation of Galaxies.

So Hatch, trained to run down fragmentary piracies and an occasional run-in with some spaceman whose operations exuded an odor into space, was no more trained to space combat than any of his fellows. He had exercises, but had never heard a shot fired in wartime anger.

So Hatch sweated it out.

He flipped off his drive so that he would not be seen. His hand trembled, halfway to the microphone of his infrawave. He stopped it, lest he be heard.

Flipping off his drive was good for another reason too, he told his quaking mind. It also kept up his speed instead of decelerating to a dead stop in the middle of this incomprehensible, magnificent, dangerous-looking fleet of space battlecraft.

Personal safety, and the hope of—

HATCH laughed at himself sourly. He was in space, not hiding behind a tree on a battlefield-to-be. He was floating out there in the openest open that had ever been opened, where it was definitely true that if he could see them, they could see him. Trying to hide in the mid-

[Turn page]

dle of that task force was like a man as masculine as he was, trying to troll unnoticed through a mass meeting of the Gamma Upsilon Mu—better known as the "Get Your Man" sorority.

Besides, other men were back there in space that must be warned. Probably he had already been noticed, and zeroed-in from a few of the smaller projectors in that task force. They would hardly let him pass through the fleet and go free. They might not blow him out of space until the last moment, to preserve their element of surprise. But the men back there—

He reached for the microphone, took a deep breath, and offered up a brief prayer to get his lines through before the blast came. And that the blast be a quick and merciful blackout instead of a slow and painful matter of dying all alone, deep in space. . . .

Wilson was striding up and down the stereo room when the loud-speaker on the wall bellowed into a strained roar:

"Commander Hatch to Commodore Wilson on emergency priority!"

The entire personnel of the plotting room froze solid.

"Wilson! I've just contacted a fleet of warcraft, big ships with nasty-looking projector sort of things looking out of mobile turrets. There are big ones! Bigger than anything we've ever built, and skeletonlike things that have open decks loaded with one-man fighters. They're—" . . . .

Viggon Sarri said crisply, "Get him! Alive!"

Regin Naylo barked crisp orders, and some of the ships took off to surround the small Earth scout craft. One of the big cruiser class swerved over and hurled out a blanketing infrawave that quietly clamped down on space and shut off Hatch's transmission as abruptly as cutting the wires on a telephone line. Except that there was not even a click. . . .

Wilson grabbed a phone and barked, "Froman! You're Hatch's second. Scout that! And report constantly!"

"Affirm, Commodore!"

Wilson called Admiral Stone. "Trouble, Admiral." he snapped curtly. "We've contacted what appears to be a war fleet in space."

Admiral Stone was dumbfounded. Like many others, he realized that the mathematical probabilities of there being another sentient race in the Galaxy was almost a certainty, that considering the billions of stars, the figures read to the tune of probably some twenty thousand such planetary races, even taking the probabilities in a pessimistic quantity.

But twenty thousand sentient races sprinkled across a volume of space with the infinity of the Galaxy gave each and every one of them a lot of room. Their making contact with one another was slightly less probable than the close passage of two stars.

Then the men of Earth waited again.

They realized that nothing is ever done right in a hurry. Light leagues of space separated the human forces from the alien. Light years had to be crossed. As time passed, everybody sat tense, each with his own personal thoughts.

An alien race? Certainly everybody expected that Humankind would some day meet up with some stellar race distant and remote and probably as exotic-looking as anything that the most lurid magazines had ever used on their covers. Or possibly they would be human-looking. Each man had his own ideas, and no two were exactly alike. The aliens would come as friends. They would be met as friends. They would come as superiors to help them to reach Utopia, or come as masters to make them slaves. They were humaniverous—or they were good to eat themselves. And what might happen to an intelligent filet mignon?

And so the time passed slowly until Hatch's second, Major Spaceman Froman, and his scouts made contact.

THEY were wide spread as they came against that space lattice of Viggon Sarri's first wave. Their reports were sketchy and incomplete, because they had been ordered to make contact, to observe, and to sweep back. In snatches they described the fleet:

"Thousand feet long—"
"Five hundred in diameter—"
"Twelve turrets—"
"With four projectors each."
"Two forward and—"
"Two at spread behind."
"Carriers—"
"Why haven't we got carriers?"
"Fighters with fixed—"
"Hundreds of them!"

Stone heard, and digested the ramble of information. He heard things described that he could not believe, and things that he had to accept.

"Wilson!" he barked. "Retreat! Retire."

"But look, Admiral—"

Admiral Stone took a deep breath and fought his dazzled mind into a semblance of order.

"Commodore Wilson," he snapped crisply, "official orders. You are to abandon this search. At once."

"But do you realize—"

"Stop it, Commodore Wilson!! I am well aware of the fact that there are three human lives at stake. But under these circumstances I cannot permit three thousand lives to remain in jeopardy on the scant chance that three may be saved. You are ordered to abandon the search and return to base."

"Admiral, I—"

"I sit here arguing with you, Wilson, because I don't want to take punitive measures. But please understand that you are facing a battle fleet of unknown strength and unknown fire power, both factors of which must certainly be greater than any power or number we can put in the field. You cannot face them, Wilson! Your space rifles are stowed and your ammunition holds are empty. Your torpedo bays are stocked with a few scattered practice missiles with smoke-flare warheads. Your fire-control equipment needs overhaul and adjustment, and your lockers are not checked out for battle maneuver. For the safety of your men, Wilson, and for the safety of your home, you must stop this senseless argument and obey your orders!"

"Sorry, Admiral, I—"

"This is mutiny!"

"I guess it is, but I am going to find—"

"You will transfer your command to Mr. Manning, who will take the temporary rank of Commodore Executive. You will consider yourself under arrest without confinement to quarters, and you will present yourself to my office upon your return."

"I will do nothing of the sort!"

"Then I must take punitive measures . . . Attention, all squadron commanders and officers above the technical grade! Commodore Theodore Wilson is relieved of command, and you are to proceed on your own flight plans to your individual bases. This is by order of my office. I am Admiral Stone."

Toby Manning came in, and behind him were Edwards and Wainright. Wilson faced them angrily. "Well?" he snapped.

Manning looked uncomfortable; but said nothing.

"By Regs," said Wilson slowly, "I am still in the command of this squadron."

Toby Manning nodded slowly.

"I am refusing to obey orders. I am not placing my squadron in your command, Mr. Manning. Understand?"

Toby smiled crookedly. "I understand. You are accepting all responsibility, and you are telling me that if I do not follow your orders, I am disobeying a senior officer."

"Precisely."

Wainright said, "But look here, Ted, isn't that—"

Wilson's laugh was brittle. In it was no humor at all. "That is precisely right. Even though I am disobeying my senior officer, Mr. Manning will be disobeying his senior officer if he does not follow my orders."

"But isn't Admiral Stone senior to all of us?"

"Yes. But he is a distant senior to you. I am your immediate superior. And now, damn it, stop making like a space lawyer and let's start hunting!"

Wainright nodded, but as he turned

to leave he was muttering:

"Wish we had more than the steak knives in the wardroom to fight with!"

X

VACANTLY the three survivors of spacewreck, in the lost lifeship, stared at the grille of the infrawave receiver in the deadly silence that followed Admiral Stone's last transmission. This was the end of message, end of hope, end of them.

Jock Norton' toneless voice gritted, "That dumb rips it wide, doesn't it?"

Alice Hemingway's voice came out, weak and thin. "Ted- you tried. Now you'll—"

Andrews stood up quickly, and strode across the floor shakily. He faced the infrawave receiver with a mad glitter in his eye, and he roared:

"Damn you, come back! Damn you, come back!"

Over and over he roared the inane words, and as he roared, his anger and madness increased until he was beating a fist on the cabinet in a violent rage.

The infrawave said crisply, "Flight Squadron Nineteen in flight pattern for Procyon Four."

"No!" screamed Andrews.

"— time." continued the infrawave.

"No!" screamed Andrews again, beating the cabinet with both fists now.

"Ten!" said the infrawave, and Andrews came down on the cabinet with all of his wiry strength.

"Nine!" The beat became a rhythm with the call.

"Eight!" Another hard slam left blood marks on the metal.

"Seven!" The cabinet bent inward. A shower of glass fell from the tuning indicator.

"Six!" Almost lost in a solid thunk.

"Five!" And after the blow something sputtered to the speaker's throat.

"Four!" Knobs bent, and Andrews' blood drooled along the cabinet front toward the deck.

"Three—" With a fizzling sound the infrawave died, and said no more.

Insanely the man beat upon the bent cabinet in the same rhythm although the sound had died. He beat and he beat until the stun and shock had been wiped out of Jock Norton's face. He came over and hauled Andrews from the cabinet. The financier struggled, but it was futile against Jock's size and strength and youth and stamina.

The pilot trapped Andrews flailing arms and held him immobile until rage, madness and hysteria had passed. Andrews lay silent, his face blank, his breathing shallow.

Norton looked at Alice. "Stroke?" he asked worriedly. "Has he got a bad heart?"

Alice looked up, the semi-blankness fading from her face. "I—don't know. Is he—"

"He's passed out or burned out, or worked himself into a faint."

Alice brought a blanket as Norton lifted Andrews to one of the bunks. "Jock?" she asked.

"Yes?"

"What does this mean? Enemy ships and all that?"

"It ain't good, baby. From somewhere has come the inevitable transgalactic culture, only with guns instead of gifts."

"But it isn't like us to run."

He nodded soberly. "Yes, it is," he told her positively. "The first man lived to start the human race by knowing when to run like hell. He ran until he could pick up a handy rock to throw. That's what our men have done. Run home to get our rocks."

Alice looked wistful. "And Ted?"

Jock shrugged. "I wouldn't know," he said. "He'll probably get busted a few grades for insubordination. They took his command away. That's one way of preventing full insubordination from an officer who might have a lot of public sentiment on his side, or good high-rank material in him. They take away his command *before* he disobeys, slap him down a few steps for trying, and let him sweat it out."

"I'm glad," she said simply and her voice was calm.

NORTON looked at her strangely. She caught his look and smiled, almost serenely.

"It would be a shame," she said, "for Ted to have to lose his rank and his prestige and his honor, and maybe his life and the lives of all his men, by doggedly staying out here in the face of an enemy fleet, against orders."

Norton nodded dubiously. "I suppose so," he said. "But do you know where that leaves us?"

"Yes," she said. "I know."

Tears welled up in her eyes, and she leaned forward to find strength in his arms, and a rest for her weary head on his shoulder. He held her, gently stroking her hair with one hand and pressing her against him.

She stopped sobbing after awhile, and looked up at him. Murmuring softly, he leaned down and kissed her eyes. She clutched at him and swayed in his arms. He found her lips then, but there was no fire in them.

Nor was he surprised. For there was no fire in his own, either. . . .

Viggon Sarri gloated, "Ver-ry interesting. Ver-ry."

Faren Twill shrugged. "Just what else did you expect?"

Regir Naylo snarled. "We had 'em in your lap," he complained. "And nobody gave the order to fire. We could have chased 'em inch by inch, but all we did was to hang here in space and scare the hull plates off of them and let 'em run like rabbits."

Viggon smiled. "Exactly. I expected one of two things. They could have swarmed into us senselessly, suicidially, to take whatever toll they could take before they lost. That's why we had the projectors alerted and the fighters hot. I don't even open an air hill without protection, gentlemen. So they did the other thing."

"Sure," growled Regir Naylo. "They could either stay or run. Since they didn't stay, they—"

"Stop being smart," snapped Viggon Sarri. "Or weren't you listening?"

"Yes, I was."

"Then you should realize that what they were doing was behaving sensibly. Just what would you do, Naylo, if you were wandering through a woods unarmed and a large, unknown, and completely unexpected beast leaped out on your path?"

Naylo sneered. "I'd run."

"Then what?"

Naylo's eyes widened. He said at last, "I'd run until I got where I could get armed, then I'd probably go back hunting the beast."

"Exactly. But not too good an analogy, which is my fault. They did not run in abject terror. They sent scouts to spy us and report our strength as best they could. Then they retreated. There's a difference. They *reported* home, but *retreated* to their base or bases, because they knew that they could do no good by hurling themselves on us."

"They want to arm themselves?"

"Precisely."

"And what do we do now?"

"I think we had best question the one we picked up."

Linus Breu shook his head. "Not that one," he said.

"Why not?"

"When we pried open his scoutcraft, he came out a-fighting and he fought until we had to take him over. He clipped several of our boys, and I'm afraid we got a little rough. Our fighting men can get hard, you know."

"Dead?" demanded Viggon.

"No. But he'll be in no condition for an extensive questioning for some time."

"Damn! Well, the next best thing to do is to collect the lifeship. We know what we wanted to know about their mass reaction. Now we must learn about their individual reaction to an awkward and dangerous situation."

Faren Twill picked up the microphone and ordered a flight of light destroyers into action. . . .

WILSON sat in the demo room of the detector ship and cursed. The lights flickering were still across the presentation surface, flecks and streaks

of spurious response. But with space cleared of the horde of searching spacecraft, the flickings and the streakings had diminished, although that cluster of spots still held its position.

Wilson said to Allison, "Seems to me we could have volunteered to stay out here and keep watch."

Allison was shaking his head when the dome went black again. "They wouldn't believe you," he said.

One of the techs readjusted something and the presentation returned.

"It's a damned funny business, this Space Service," said Wilson. "Any service, I guess."

"How so?" asked Manning.

"If I give a wrong order and you disobey, to keep from piling up, you get clipped for it. If you don't refuse to carry out the order and we pile up, I get busted—if any of us come back whole."

"I wonder if they have that trouble, too," Wainright said musingly, looking up at the cluster of dots that represented the enemy fleet.

"Probably. I hope so."

Edwards shook his head. "I'd rather fight an enemy that had no iron-bound discipline. Let 'em run wild, taking their own ideas as they come. Let 'em argue with the skipper. Let 'em quit if their commander doesn't play their way. That's the difference between a mob and a service, Ted."

Wilson grinned. "Call it confusion then!" he said, with a wave at the dome. "And I hope they have it!"

As they watched, a group of dots moved from the group and started away, slowly, at an angle. They watched until the dots had progressed a few feet from the main cluster.

Ted Wilson eyed them intently. "There must be some reason . . . Allison!"

"Yes?"

"See if you can project an imaginary line across that damn dome! I'll bet that our lifecraft lies somewhere along the course!"

Allison yelled, "Jones! Halligan!"

The dome blacked out with a puff of smoke from one bay. A tech groped deep in one of the open panels and went to work with long-handled tools. Someone called above the hubbub that they'd have it back in shape in a minute.

Wilson mumbled, "Sixteen thousand delicate infrawave parts, and a half-million electronics components, all balanced on the pinpoint of a page of equations rolled into a dunce's cap! And I have to live with it!"

Allison grumbled, "Hell, nothing is perfect the first time."

"All right, forget it." Wilson shrugged, as the dome flickered on again.

It made a flowing, over-and-over turn. Then the presentation spun around some one of its personal axes of no particular coordinate, like a planetarium being operated by a patterer who wants to see what happens when he pushes any button at random.

It settled down.

Jones and Halligan set up their sighting devices in the center of the big floor and began to project their line across the dome.

One of the techs came running up to Allison. "If we change the driver response threshold by seven ultrachronic levels—"

"Go away, Magill. Maybe tomorrow."

"But look—"

"You look. I said—"

A white-yellow circle appeared on the dome with a red line cross on it like a telescope reticule. Halligan was aiming a flashlight pointer at the dome and talking into the floor mike at the same time.

"Hey, Allison! Maybe that's it?"

IN THE circle was a pinpoint that came and went. It danced now and then, and it sloughed into flowing shapes as it merged with the rest of the flickering on the dome. It would have been lost in the ever changing light pattern of the dome if there had been no reason to suspect it. The spot lay on a dead line

across the dome from the course of the other spots.

"All right," Wilson said grimly. "We've got no more scouts to go look. Turn this crate head-on for that trace and we'll barrel!"

Slowly the presentation in the dome shifted. The almost lost spot rose until it was dead above.

"Pour on the coal!" yelled Wilson. "We've got to get there first!" He grabbed for the infrawave phone and cried, "Hello, out there! Lifeship Three, we've sighted you! We'll be with you in—" He glanced at Allison. "How far are they?"

Allison shook his head. "That's one of the limitations. We can detect, and display in solid angle azimuth, but we haven't got to the ranging yet."

Wilson said a few words that should never have gone out over the infrawave. Then he said into the phone, "Well, we've sighted you, anyway, and we'll be with you soon." And to Manning he said, "I hope to God they've got their receiver on. . . ."

Linus Brein said, "I didn't catch part of that. New words for the files, I guess."

Viggon Sarri said, "Probably a few words of condemnation over the fact that their detector doesn't range."

"I'll catalogue them so."

"Do that. Maybe we can ask their specific meaning at some later date. But I'd not be inclined to bark those words at one of them to see what happens. It might happen. Linus, how do we stand with them?"

Linus consulted a chart. "They're a little closer to the live ship than we are. But we're faster."

"Faren, can't we get any more speed?"

Faren Twill shrugged. "We've a destroyer escort," he said. "If we don't mind leaving the destroyers behind."

"Pour it on," said Viggon Sarri sharply. "Then have the destroyers fan out in an intercept pattern just in case. . . ."

"Cold," said Alice in a thin voice.

But it was not really cold; it was the giving up of all hope, the turning off of all will to live, that made her cold.

Norton cradled her in his arms and thought of how this would have been if they had been snug and warm a planet, instead of lost and alone in space. Her slender body against him did not bring passion, but compassion. He stroked her head and tried to warm her shivering body.

Andrews still lay in a coma.

Jock Norton looked over Alice's shoulder at a wall cabinet. In that cabinet were some capsules that would bring a merciful end before the real suffering began. Andrews probably wouldn't need one. But maybe—maybe—

Slowly, as if doing something against his will, Norton disentangled Alice's arms. Gently, lest she stir and cry out in fear, he broke her hold on him and stroked her arms for a moment. He slipped his own arm out from beneath her neck and held her with his other arm for a second or two.

She was moaning faintly, staring at the ceiling and not really aware of what he was doing. He slipped off the bunk and walked across the room unsteadily.

Slowly he went, for the idea in his mind was against his determination. He cursed the ruined transmitter, and snarled under his breath at the broken receiver. Then he fiddled with the catch of the cabinet, his fingers obeying his subconscious, instead of his not too firm will.

HE TOOK two capsules from the bottle and went back to Alice with them in his hand. He had reached, was standing beside her, when he looked at his closed fist and decided to wait it out one more minute before he popped one into her mouth and took the other one himself.

For life, as poor and precarious as it was at this moment, and as likely as it was to get worse, was still better than taking that long, unknown and unpredictable step into the Long Dark.

His minute passed all too quickly.

Alice shuddered and pressed against him. "Ted," she pleaded weakly. "Ted—hold me."

"Yes, darling," he said softly. There was no point in hurting her any more. Let her think he was Ted, if that was the way she wanted it.

Andrews stirred, and groaned.

Norton looked at him, frowning thoughtfully. Maybe Andrews should have his easy out, too. It would be tough on the guy to come to, and find himself the only live one in the ship, and of course not know where to find the remedy.

The pilot decided to stall for another minute. He'd get another capsule and slip it to Andrews. Then he would hold Alice once more and keep her happy, thinking he was Ted.

"One moment more, honey," he breathed into her ear, then kissed it gently. "I've got to get you something."

"Hurry," she murmured.

Hurry? Yeah! Get it over with!

The trip across to the cabinet was longer this time, for the idea was still rubbing him the wrong way.

"Aw, hell!" he grunted, as he reached for the bottle again.

XI

AS COMMODORE THEODORE Wilson eyed the infrawave detector presentation on the dome of the detector ship, he groaned. The presentation of targets was stronger now. At the apex of the dome was the lifeship, its response waxing and waning, but always strong enough to stay visible even at its lowest ebb.

Some forty or fifty degrees down the hemisphere was the stronger response of the enemy warcraft, hanging motionless in the dome. The group of space craft that had come with it were dispersed in some complicated pattern. Most of these were lost in the tricky shift of the spurious lighting of the dome. Others had disappeared completely because they were out of range.

"Pilot!" cried Wilson. "Can't we pour on more power?"

The pilot rapped his levers with the heel of his hand and shook his head slowly. "Sorry, sir. We've been at the top of the military emergency range all along." Occasionally he looked back over his shoulder at the motionless enemy response in the dome.

No man in the detector room needed a fancy ranging detector and a computer to know the worst. The infrawave would not range, but it was good enough for this. The inefficient detector and knowledge of one of the simpler facts of navigation told the whole unhappy story.

When the angular position of a distant object remains constant to the observer in a moving vehicle, they are on collision course. And so long as that observed angle does not change, they will remain on that collision course, right up to the bump. Distance, or angle of attack does not contribute or detract. The fact remains.

The object may be stationary, or the observer may be stationary and the object moving, or both may be moving, but so long as that angle remains constant, they will collide. One may be curving and the other in acceleration or deceleration, but if the observed angle does not change, it's still collision.

In fact, there are only a couple of exceptions to this. One is when the subject object is astern and moving dead away *from* a collision, or what might have been one before either ship moved onto the course. The other is when a circle is cut with the object at dead center. Make it a spiral and you have your course of danger.

Put it in space, or on the sea, or in the air, or across the land, and the same holds true.

So the fact that the enemy warcraft hung at some forty or fifty degrees and did not change its position meant that the detector ship and the enemy warcraft were going to meet! And undoubtedly at the point where the lifeship would be in the middle because the enemy was obviously heading for that spot. When they hit, the enemy warcraft

would come through the detector dome exactly where its response now registered.

"Can't we stretch something?" demanded Wilson.

Manning thought about it. "We'll bust something if we—"

"Then bust something!" barked Wilson.

Manning and Wainright took off below, while Ted watched the spot over his head. He tried to guess whether he was closer to the lifeship than the enemy, or whether it was the other way around. Not that it made any difference to the chase, but it did mean that he or the enemy was the faster of the two.

Wilson put his chips on the enemy. But until he had two sides of range to his included angle of forty-odd degees, no one could tell.

Then the spot moved down a hare pride, faltered, and continued to flow slowly back toward the rim of the dome.

Wilson gave a howl of victory just as the infrawave detector conked out again. The crew scurried madly to repair the fault. He was still looking glumly at the blank dome when the infrawave phone rang beside him.

"Wilson!" he barked in it angrily.

"Wilson, I'm pleading with you to use some common sense."

"Admiral Stone, I've located them! We're on our way to get them and nothing anybody says will—"

"Still disobeying orders? Still mutiny?"

"My Good God, Admiral Stone! You wouldn't want me to abandon this search now that we've located them?"

"Wilson, you're out there with a crew of our top-flight infrawave engineers, physicists, and theorists, along with about eight billion dollars' worth of experimental gear. You're flying that responsibility into the teeth of an enemy."

"Admiral, I'm taking a calculated risk."

"If you manage to get back," snapped the admiral angrily, "you'll . . . Oh, hell! It'll be better for you if you don't, that's all."

The detector dome came on again, and at the same time came the first faint failing whimper of a response from the reliable magnetic mass detectors. Wilson eyed the small celestial globe, saw that its angle-attack was that of the lifeship, and shouted into the phone:

"Admiral, we've got 'em on the magnetics! I'll be seein' you later."

He hung up the telephone on the admiral's shout of dismay. . . .

VIGGON SARRI snarled something to Regin Naylo and the second officer went below to snarl something at the engineering crew. They went to work shorting out the safeties and cutting out paths of attenuation.

Viggon Sarri read the detector with a set face and said, "Linus, we're barely keeping pace. Losing, if anything."

Linus Brein said, "You've got a half dozen one-man fighters aboard."

"They're no faster than . . . Wait a minute! We can blow 'em out the forward catapult and add the catapult speed to the ship's speed."

The flagship became a flurry of action. Men hauled the fighters aloft and one by one they were hurled out of the launching tube. They kept their added velocity and slowly, yard by creeping yard, the fighters drew away from the mother space craft. But yard by crawling yard would be enough by the time the whole distance was covered. . . .

Wilson said to Maury Allison, "You've got a fender ready?"

"Yes."

"All right, then. Let's plan this operation carefully. As I see it, we're going to have a split-second advantage, and we've got to make good use of it."

Allison eyed the dials on the magnetic-mass detector, and made some calibrating adjustments.

"From what I can tell," he said, "the lifeship is in free flight along a course not more than ten to fifteen degrees angle from our own free flight course. We've been in a slight-vector thrust, you know."

Wilson nodded. "That's all to our ad-

vantage. Now unless I've miscalculated, I think I can be belted out of here in your tender. I'll make contact, then continue on until you catch up with me. Right?"

"Sounds reasonable."

Allison gave some orders to one of his techs. The tech punched his keys for a half-minute and waited another ten seconds for a strip of paper to come out of the machine in jerky sequences. He tore the paper off when it had stopped, and handed it to Wilson.

"Here," he explained, "are a group of possible time-versus-velocity courses. Follow 'em exactly and we'll make space contact on the other side."

Wilson looked at Allison. "Wish me luck," he said.

Allison nodded. "You've got it," he said quietly. "You know we're for you, or we'd not be here."

"If I don't come back—"

Allison's face drew taut. "If you flop out there," he said solemnly, "Toby Manning is next in command, and he'll be forced to follow orders from Base. So don't flop, Ted."

"I won't," promised Wilson.

He fired up the tender, waited until everything was running hot and ready, and blasted himself out of the exit port forward. He set his magnetic detector and patch-corded it to the drive so that the warp-generator would close down and the drive would cease at the proper instant for deceleration in close proximity of the lifeship.

Although the long-range search radar was completely useless at velocities even approaching the speed of light, Wilson turned it on and checked it out in readiness. He patch-ordered it also to the basic space drive, to take over after the velocity of his ship fell below the speed at which radar became useful.

Then he waited, with one eye on the timer. The detector ship faded behind him and was lost as his lighter spacecraft responded to the drive.

He wished helplessly for an autotimer drive, because he knew that his hand and eye were not accurate enough to do the job as smoothly as he'd have liked. He wanted a bigger ship with a monster-sized drive. One of those spaceport huggers that can bump spacers from berth to berth would have been fine, even though they carried insufficient storage power for anything more than close to Base operations. He wondered whether such a ship would be too massive for fast maneuverability, and decided to ask about that, some day.

THE hundredth-second sweep hand of his watch came around and up, and he began matching its motion with a rythmic beat of his hand on the reversal lever as the hand crossed the tenth-second marks. By the time the hand was swinging close to the zero-second, his beat was close to perfect.

The hand crossed the top and Wilson beat down on the lever hard!

The ship swung around in space and the drive flared out on the forecourse as the tender began to beat its terrific velocity down. Wilson felt that peculiar prickling of the skin that comes with a swiftly closing warp generator, but he knew that it was deliberate, and not a failure.

He tried to force it down faster; tried to make the driver harder. His hand rapped the power lever again and again, ramming it against its hard stop as if he could force the setting higher than maximum.

There would be particular hell to pay when he got back home, but he would have the personal satisfaction of having accomplished his mission. He put the future out of his mind because he had no idea of what kind of special hell would be given to a man who was successful, because of disobeying orders.

He watched the meter crawl down to the red mark and below. Then the warp-generator collapsed with a jar. It was a little too soon. The speed of the tender was still high—not above light, of course, but high enough so that its Einstein Mass created quite a warp in space.

He felt the heat leap high and knew

that the tender had slowed with the same sort of deceleration as a bullet hitting a patch of thin wool. He did not lurch in the ship for he, himself, had the same Einstein Mass effect. He felt a hot-sweat fever fill him as the excess mass reconverted into energy.

He shook it off, but knew that eventually he would pay for that sudden fever, with its biological effects. Then the long-range search radar produced a distant response and Ted Wilson put everything out of his mind except the problem of matching velocities with the free flying lifeship.

He called on the close-range radio, frantically pleading for those in the lifeship to alert and be ready. He got no answer, which made him break out in a cold sweat.

The radar picked up the flight of Viggia Sarri's one-man fighters, and Wilson looked out of the dome to see if they were within sight.

They were, of course, too distant to be visible, but in the radar they were closing fast, converging upon the lifeship from a fairly tight solid angle. He clenched his fists and made a fast calculation. So far, he was ahead.

One of the course plots gave him a full twenty seconds at the lifeship. Anxiously Wilson tried to urge his ship on, even though he knew very well that the equations of time and velocity and distance provided only a single solution that could be considered at all practical.

When he caught visual sight of the lifeship, he estimated it to be no more than three or four miles ahead. His radar confirmed that. It was nerve-killing to wait as he closed down the separation, knowing that the enemy fighter craft were also closing down.

The infrawave chattered, "Wilson? How are we doing?"

Wilson told him what was going on, and Allison urged Wilson to brace himself. Allison talked steadily in a calm voice, knowing just how hard it was for Wilson to sit there, a helpless victim of a pre-set, mechanical program that promised a pre-calculated victory of time and space and velocity.

Wilson's human mind would not really be trusting calculations and split-time electronic measurements. It would demand that he leave his ship and run, that he take the levers and drive, that he do something—anything—except sit there calmly and dog it through.

Wilson saw the drive flares of the enemy, bright and dangerous, closing in from a distance of a good many miles. It was mere miles, out here in deep space where a mile was a meaningless, insignificant quantity. He could almost feel the immensity of space around him in comparison to the awful closeness of danger.

WILSON had expected that at least those aboard the lifeship would be peering out of the observation port. He put himself in their place and knew he would have been scanning the dead and merciless sky for the first sight of a flare. But as his tender crept up alongside the lifeship with maddening slowness, there was no sign of life aboard.

It took whole seconds to match the final few yards per second per second of declaration against the free-flight velocity of the lifeship. Then it took more dragging seconds to urge the tender in an alongside course that brought lifeship and tender port to port.

They matched, and Wilson hit the lever that powered the annular magnet that snapped the two space locks together hard enough to compress the bellows into an air-seal.

He was at the space-lock before the two ships had really settled together. He was spinning the hand wheel, then clutching at the fast-escape lever of the lifeship.

"Hike!" he bellowed, as the lifeship lock opened. "Hike! We've got twenty seconds before—"

His voice stopped dead, his heart faltered a beat, and his mind rebelled at the shock of what he saw.

Charles Andrews was lying on one bunk, his bleeding hands staining the blanket. His breath was shallow and

regular, but he was wheezing with every breath. It was the sound made by someone who has lain far too long in a semi-coma, until nervous system and automatic reactions have become so dulled that phlegm in the throat does not produce a cough.

Jock Norton lay on his back with his eyes not quite closed, but all that was visible was the whites below the iris because his eyes were turned up. His right hand dangled to the floor beside the bunk, his left arm lay limply around the shoulders of the girl.

Alice's face was buried on Norton's shoulder, her left arm flopped loose across Norton's chest. Her right was trapped beneath her.

As Wilson looked, Norton's shallow breath clogged and he began what would have been a wallop of a cough, but his breath did not waver. His clogged windpipe kept making little soggy noises as the wind-stream changed in and out and in and out.

On the floor a few inches away from Jock Norton's hands was a bottle of capsules.

"Hadamite!" breathed Ted Wilson helplessly.

Hadamite, the synthetic drug, at once a curse and a blessing. A blessing to a sufferer, but a curse to one who finds the false world of self-satisfaction more pleasant than the work and worry and alternate periods of happiness and grief of reality.

Under hadamite, the slightest ambition becomes pleasantly real, desire becomes accomplishment, doubts disappear, and fears are overcome. And under hadamite life becomes so desirable that the mind refuses to return to reality. With an overdose, the mind accomplishes its aims, finds full satisfaction, then lies down to that final sleep with the complete knowledge that everything has been done, and that there are no more worlds to conquer.

Wilson rushed to the cabinet and scrabbled among the bottles and boxes there until he found the antidote. He filled the dropper on his way across the cabin and pushed the end into Norton's mouth with one hand while he levered Alice over on her back with the other. He discharged the contents of the dropper into Jock Norton's mouth, refilled it, and squirted another load between Alice's slack lips.

Brutally he pushed down and up, down and up on their chests until he heard the sogginess slurp down their throats.

Then he slugged Charles Andrews in the same way.

"Twenty damned seconds!" he snarled, in bitter realization that it would take him longer than that to carry one of them into his tender, let alone all three.

HE WAS standing there in the middle of the cabin, his mouth set hard and his mind whirling with the futility of it, when Viggon Sarri's one-man fighter group closed down and clamped onto the hull. Wilson was cursing fervently when he felt those forces close down.

The cabin floor surged gently as a sideward vector of acceleration of Viggon Sarri's task force was applied.

Ted Wilson picked up the fallen bottle of hadamite capsules and contemplated them sourly. He might have done better by not bothering with the anti-dote.

He had failed completely.

He had come aboard, only to find his girl in the arms of the pilot, all of them doped and heading for a painless death. He had prevented them from dying, but had kept them alive only to meet some unknown future at the hands of an unknown enemy.

Wilson hurled the bottle of hadamite capsules against the wall where the first searing circle of a cutter was beginning to come through.

He was shaking his fist defiantly at the wall when Viggon Sarri and his two lieutenants came through to meet their first Earthman face to face. . . .

In the commander's quarters aboard the flagship of the alien task force to

which Ted Wilson and the three unconscious occupants of the lifeship had been removed, Viggon Sarri faced the Earthman. He spoke to Wilson directly, but his voice was picked up by a microphone. Each word he spoke went into the master logic computer in Linus Brein's ship, and returned to a loudspeaker that reduced Viggon Sarri's inflections and tones to a tinny mechanical reproduction in the Terran tongue.

"Please relax," he said. "and understand that we want only information."

Wilson was alone now. The others had been placed under a doctor's care.

"After which we get what?" Wilson demanded belligerently.

Viggon Sarri's voice was harsh, but it came through the loud-speaker in a flat monotone. "Whatever course your race prefers to take!"

"How's that?" asked Wilson.

"Your future is up to you."

"Seems to me you've been calling all the tricks."

Viggon Sarri nodded. "We hold every trump but one," he said. "We could conquer you by force, or we could annex you as a subject race. We could infiltrate you by various economic means. Or we could possibly reduce you by attrition to a chaotic condition. But we probably could never muster enough numerical strength to subdue you completely and make it last."

"Huh?"

Viggon Sarri nodded. "Regin Naylo, here, proposed that we attack and conquer by force, not being experienced enough to realize that such a course breeds everlasting resentment and eternal revolt. You'd fight to the last, and those of you who were not exterminated would hide and plot revolt until one day you'd rise to displace our rule. Faren Twill, over there, suggested a form of benevolent protectorate which would only breed contempt. You'd quietly learn everything you could learn from us, then coldly turn on us and carry battle to us."

"Probably."

Viggon Sarri nodded. "On the other hand, progress across the Galaxy would be halted because we'd both be so busy fighting one another that there would be little effort left over for the vast and endless program of expanding across the countless stars."

"Well?" Wilson shrugged. "It seems to me you're still calling the cards."

"We've called our last card, Commodore Wilson. From here on, as I said, what happens in the future is up to you, and yours. Resent us, and progress will stop. Join us as equals, and we can work together as we spread from star to star—and I daresay there are enough stellar systems to keep us from stepping on one another's toes." Viggon Sarri smiled at his two lieutenants. "We have much to learn from one another, Wilson. We can teach you patience and logic, and from you we can learn tenacity and determination."

A MEMBER of Viggon Sarri's crew came into the room and spoke quietly into his commander's ear in his native Bradian. He spoke in too low a voice for it to be picked up by the microphone.

Viggon said, "You'll be glad to know that your friends are all three conscious, Commodore Wilson."

"Alice is all right?" Wilson cried.

"This man will take you to see her," Viggon Sarri smiled.

Wilson headed for the door behind the orderly as fast as he could. By the time the orderly had reached the portal, Wilson was almost on the Bradian's heels.

Viggon Sarri turned to his two lieutenants and said, "We can learn much from these Earthmen. Eagerness, for instance. Eagerness—and emotional love." He looked at his hands, flexing them outward, then inward. He was thoughtful for some time before he said, "Lay a course to Sol, Naylo. We'll take them all home. And you, Twill, see if you can connect with Brade on a person-to-person private channel. I'd like to talk to Valdya. Maybe she's as lonesome as I am now." ● ● ●