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The Gift of Gab BY JACK VANCE

DORMIPHONE

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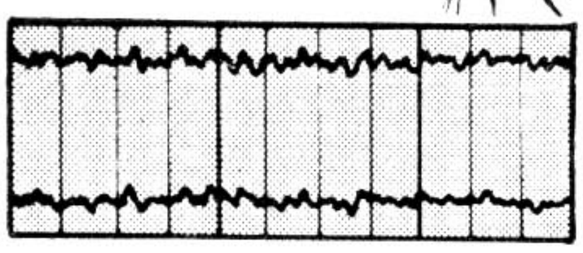
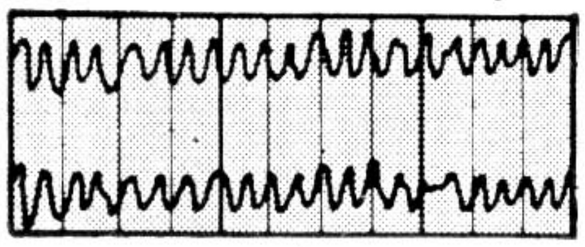
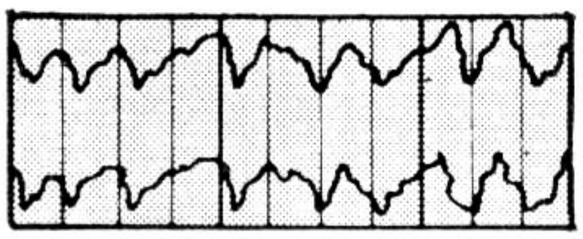


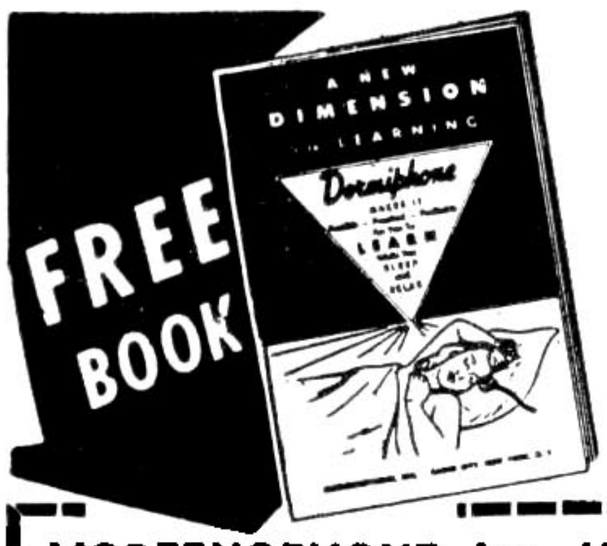
Brain in concentrated thought.



Brain in relaxation.



Brain while person sleeps.



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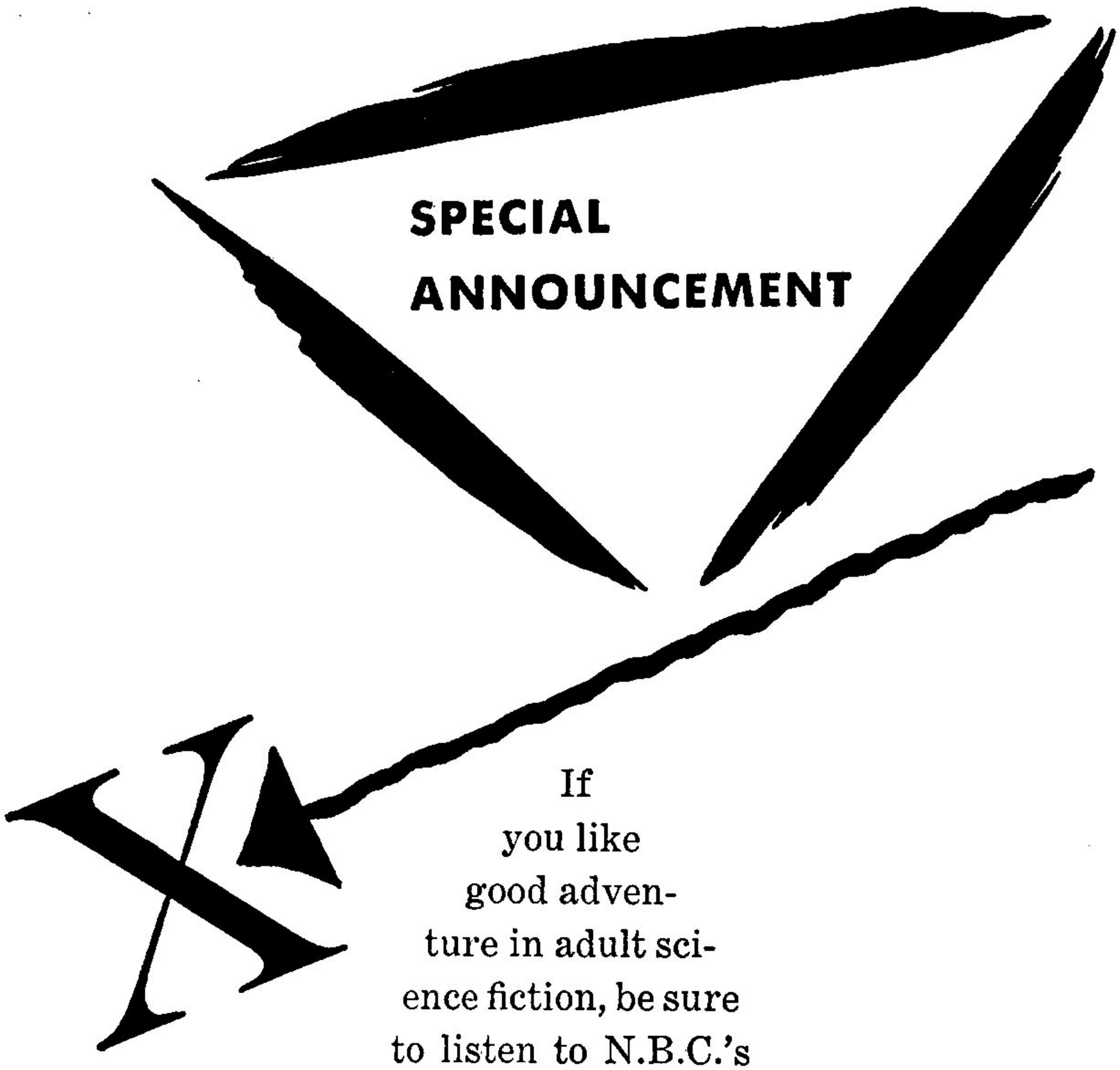

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Astounding
SCIENCE FICTION

VOLUME LVI • NUMBER 1 **September 1955**

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COVER BY FREAS • SYMBOL: Oscillogram of voice frequencies.
Illustrations by Freas, Poulton and van Dongen

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$3.50 per Year in U. S. A. *Printed in* 173 *the U. S. A.* *35 cents per Copy*

EDITORIAL

GAME THEORY

More than one man has pointed out that the one Eternal Truth presently perceivable is eternal Change. Whatever our culture and society *is*, it won't be; whatever you-as-an-individual *are*, you won't be. Willy-nilly, like-it-or-not, rebel as we may—we're stuck with the absolutely inescapable compulsion of going from Present to Future. There's going to be change —and we may or may not like it. But we're going to get it whether we do or not. The best we can do, then, is to see that, since change is going to occur, that the change is one we *do* like. The one absolutely certain statement possible being "Something will happen in the future," we might as well devote ourselves to making that something favorable.

Some of the great social innovators are pretty obviously just that. Jesus of Nazareth, for one. Mohammed, for another. But Ghengis Khan, and Hitler, too. Currently, there's a world-wide debate as to which group Karl Marx should be put in, but certainly he was a social innovator.

Other great social innovators are not obviously that; often they didn't have any specific intention of being such at all. Arkwright, who worked out the machines that spun cotton into thread, for instance. Henry Ford, who simply wanted a good, cheap, plentiful transportation device —but produced a massive revision of the cultural mores as a result. Einstein and his confreres, by working out the basic concepts of nucleonics have made an immediately obvious alteration in social patterns. And Einstein was, also, a basic force in the development of electronics; the social effects of that range from radio to cybernetics.

The Athenian concept of democracy—essentially a Town Meeting—was utterly impossible in any large-scale system like the United States. *"Was"* however, notice; by means of electronic communications, one

man can reach nearly the entire voting citizenry simultaneously by voice again; by application of techniques actually now available, the voting citizenry *could* respond back in a matter of a few hours. Certainly the introduction of television into political convention halls has altered social patterns.

The visible-conscious social reformers, good, bad, or indifferent, or not-yet-decided, work at the level of *theory*. The social innovators of the technical class, on the other hand, work at the level of facts—and facts have no inherent meaning. Nucleonics means world-destroying powers, and the power to reach new worlds; the *value* and, therefore, the meaning, of nucleonics is, like that of any other fact, not inherent in itself.

But very clearly, there are two types of social reformers. When Einstein tried to express some social opinions, he was promptly shushed by the professional social theorists as incompetent to speak in a field he was not expert in. Oppenheimer has been viciously chastised for allowing himself to express social opinions with respect to nucleonics. The culture has clearly expressed its extremely powerful conviction that technicians *must not* attempt to form social judgments.

Unfortunately, our slightly cross-eyed and addle-pated society simultaneously expresses the strongest disapproval of technicians for *not* expressing their social understandings by refusing to participate in such world-endangering work.

Look, friends. Let's get it straight. His effort to do precisely that is what led to Oppenheimer's vicious public chastisement. Let's not kid ourselves; no technician is permitted to evaluate his work in social terms. He is absolutely required to accept the Judgment of Society on that subject.

However, whenever Society finds itself in an untenable spot—that its judgments have gotten it into an unbearable hole—it immediately blames individuals for not "exercising their good conscience" and keeping it out of said unbearable hole. Society acts in a manner perfectly comparable to that of an adolescent kid; the adolescent rebels against advice, and then, when he gets hurt, cries, "Why didn't you make me?"

O. K.—here's some advice you can consider. Change is certain; the direction of change can be forecast from trends. The results of those changes can also be forecast. But trends cannot be timed very accurately, so how soon these factors will become operative effectively cannot be predicted.

As a guestimate, I'll go far enough out on a limb to say that we're stuck with it personally—the thing is going to happen within the lifetime of most individuals now living. And you will *not* like it; you'll loathe it, fight against it—and force it to take place. You'll support it and be its cause—and bewail its growth. That's what's happened every time in the past history of Man, so it's at least a good probability for the future.

The item coming up is Loss of Privacy of Action. The political parties of the United States are already being forced to submit to that—and hate it—due to radio and TV. So far, however, television has required the use of a transmitter at the action end. Consider for a moment the meaning of television that does *not* require a transmitter. You can call it a "spy-ray machine" or a "clairvoyance" machine; you can postulate it as the result of some type of mental training. It makes no difference; it is the effect that we're interested in. If such a device or technique once is developed, its spread will be a sort of chain-reaction phenomenon—self-propagating, its very nature forcing its adoption by wider and wider groups. The very people who most hate the loss of their own privacy will be forced to build, buy, or steal such mechanisms or techniques, thus spreading its use. Outlawing it would be as futile as outlawing ambition; if it is outlawed, then only outlaws would have its advantages, and lawful people would be helpless. If Governments insist on it as a Government monopoly—outlaws will break the monopoly, so that honest corporations, in self-defense, are forced to break the laws.

Now Game Theory has considered two essentially different types of games; the open game, and the concealed game. Chess, for example, is an open game; the rules are known in full to both players, and the fullest information concerning the situation at any instant is available to both players. Poker, on the other hand, is a concealed game; the rules are known, but the actual situation at any instant is not known to *any* player. Each player knows only a small fraction of the situation—his own immediate holdings. But the value of his holdings is determined by relationship to other players' holdings; he has absolute information, but not relative information. The value of two aces and three queens is, absolutely, high—but a royal straight flush makes its relative value zero.

The Game of Life as currently played by this culture is, in essence, a concealed game; it's based on Privacy of Action. What values the other fellow holds we are not permitted to know; what he is doing is hidden behind Privacy.

But a culture *can* operate as an Open Game—just as chess can be a very real game, even though full information is known to all players and watchers, because the *meanings* of the information is not known. White has moved his knight to Queen's Rook 4; this all may clearly observe. But the *meaning* of the move is private; the game is a tough contest indeed.

Poker, a concealed game, depends in large measure on the luck of the draw. The ability to use that luck most effectively is, of course, what makes a skilled poker player win in the long run. Poker with deuces and one-eyed-Jacks wild has a lot more luck factor, and less skill-benefit.

(*Continued on page* 160)

THE GIFT OF GAB

BY JACK VANCE

Inevitably, sooner or later, when Man spreads out from Earth, there will come the problem "What constitutes the critical test dividing animals subject to domestication, from intelligent beings not subject to slavery?" Perhaps...the Gift of Gab is the answer.

Illustrated by Poulton

Middle afternoon had come to the Shallows; the wind had died, the sea was listless and spread with silken gloss. In the south a black broom of rain hung under the clouds; elsewhere the air was thick with pink murk. Thick crusts of seaweed floated over the Shallows; one of these supported the Bio-Minerals raft, a metal rectangle two hundred feet long, a hundred feet wide.

At four o'clock an air horn high on the mast announced the change of shift. Sam Fletcher, assistant superintendent, came out of the mess hall, crossed the deck to the office,

slid back the door, looked in. Where Carl Raight usually sat, filling out his production report, the chair was empty. Fletcher looked over his shoulder, down the deck toward the processing house, but Raight was nowhere in sight. Strange. Fletcher crossed the office, checked the day's tonnage:

Rhodium trichloride	4.01
Tantalum sulfide	0.87
Tripyridyl rhenichloride	0.43

The gross tonnage, by Fletcher's calculations, came to 5.31—an average shift. He still led Raight in the Pinch-bottle Sweepstakes. Tomorrow was the end of the month; Fletcher could hardly fail to make off with Raight's Haig & Haig. Anticipating Raight's protests and complaints, Fletcher smiled and whistled through his teeth. He felt cheerful and confident. Another month would bring to an end his six-months contract; then it was back to Starholme with six months pay to his credit.

Where in thunder was Raight? Fletcher looked out the window. In his range of vision was the helicopter —guyed to the deck against the Sabrian line-squalls—the mast, the black hump of the generator, the water tank, and at the far end of the raft, the pulverizers, the leaching vats, the Tswett columns, and the storage bins.

A dark shape filled the door. Fletcher turned, but it was Agostino, the day-shift operator, who had just now been relieved by Blue Murphy, Fletcher's operator.

"Where's Raight?" asked Fletcher.

Agostino looked around the office. "I thought he was in here."

"I thought he was over in the works."

"No, I just came from there."

Fletcher crossed the room, looked into the washroom. "Wrong again."

Agostino turned away. "I'm going up for a shower." He looked back from the door. "We're low on barnacles."

"I'll send out the barge." Fletcher followed Agostino out on deck, headed for the processing house.

He passed the dock where the barges were tied up, entered the pulverizing room. The No. 1 Rotary was grinding barnacles for tantalum; the No. 2 was pulverizing rhenium-rich sea-slugs. The ball mill waited for a load of coral, orange-pink with nodules of rhodium salts.

Blue Murphy, who had a red face and a meager fringe of red hair, was making a routine check of bearings, shafts, chains, journals, valves and gauges. Fletcher called in his ear to be heard over the noise of the crushers, "Has Raight come through?"

Murphy shook his head.

Fletcher went on, into the leaching chamber where the first separation of salts from pulp was effected, through the forest of Tswett tubes, and once more out upon the deck. No Raight. He must have gone on ahead to the office.

But the office was empty.

Fletcher continued around to the mess hall. Agostino was busy with a

bowl of chili. Dave Jones, the hatchet-faced steward, stood in the doorway to the galley.

"Raight been here?" asked Fletcher.

Jones, who never used two words when one would do, gave his head a morose shake. Agostino looked around. "Did you check the barnacle barge? He might have gone out to the shelves."

Fletcher looked puzzled. "What's wrong with Mahlberg?"

"He's putting new teeth on the drag-line bucket."

Fletcher tried to recall the line-up of barges along the dock. If Mahlberg, the barge-tender, had been busy with repairs, Raight might well have gone out himself. Fletcher drew himself a cup of coffee. "That's where he must be." He sat down. "It's not like Raight to put in free overtime."

Mahlberg came into the mess hall. "Where's Carl? I want to order some more teeth for the bucket."

"He's gone fishing," said Agostino.

Mahlberg laughed at the joke. "Catch himself a nice wire eel maybe. Or a dekabrach."

Dave Jones grunted. "He'll cook it himself."

"Seems like a dekabrach should make good eatin'," said Mahlberg, "close as they are to a seal."

"Who likes seal?" growled Jones.

"I'd say they're more like mermaids," Agostino remarked, "with ten-armed starfish for heads."

Fletcher put down his cup. "I wonder what time Raight left?"

Mahlberg shrugged; Agostino looked blank.

"It's only an hour out to the shelves. He ought to be back by now."

"He might have had a breakdown," said Mahlberg. "Although the barge has been running good."

Fletcher rose to his feet. "I'll give him a call." He left the mess hall, returned to the office, where he dialled T3 on the intercom screen—the signal for the barnacle barge.

The screen remained blank.

Fletcher waited. The neon bulb pulsed off and on, indicating the call of the alarm on the barge.

No reply.

Fletcher felt a vague disturbance. He left the office, went to the mast, rode up the man-lift to the cupola. From here he could overlook the half-acre of raft, the five-acre crust of seaweed and a great circle of ocean.

In the far northeast distance, up near the edge of the Shallows, the new Pelagic Recoveries raft showed as a small dark spot, almost smeared from sight by the haze. To the south, where the Equatorial Current raced through a gap in the Shallows, the barnacle shelves were strung out in a long loose line. To the north, where the Macpherson Ridge, rising from the Deeps, came within thirty feet of breaking the surface, aluminum piles supported the sea-slug traps. Here and there floated masses of seaweed, sometimes anchored to the bottom, sometimes maintained in place by action of the currents.

Fletcher turned binoculars along the line of barnacle shelves, spotted the barge immediately. He steadied his arms, screwed up the magnification, focused on the control cabin. He saw no one, although he could not hold the binoculars steady enough to make sure.

Fletcher scrutinized the rest of the barge.

Where was Carl Raight? Possibly in the control cabin, out of sight.

Fletcher descended to the deck, went around to the processing house, looked in. "Hey, Blue!"

Murphy appeared, wiping his big red hands on a rag.

"I'm taking the launch out to the shelves," said Fletcher. "The barge is out there, but Raight doesn't answer the screen."

Murphy shook his big bald head in puzzlement. He accompanied Fletcher to the dock, where the launch floated at moorings. Fletcher heaved at the painter, swung in the stern of the launch, jumped down on the deck.

Murphy called down to him, "Want me to come along? I'll get Hans to watch the works." Hans Heinz was the engineer-mechanic.

Fletcher hesitated. "I don't think so. If anything's happened to Raight —well, I can manage. Just keep an eye on the screen. I might call back in."

He stepped into the cockpit, seated himself, closed the dome over his head, started the pump.

The launch rolled and bounced, picked up speed, shoved its blunt nose under the surface, submerged till only the dome was clear.

Fletcher disengaged the pump; water rammed in through the nose, converted to steam, spat aft.

Bio-Minerals became a gray blot in the pink haze, while the outlines of the barge and the shelves became hard and distinct, and gradually grew large. Fletcher de-staged the power; the launch surfaced, coasted up to the dark hull, grappled with magnetic balls that allowed barge and launch to surge independently on the slow swells.

Fletcher slid back the dome, jumped up to the deck.

"Raight! Hey, Carl!"

There was no answer.

Fletcher looked up and down the deck. Raight was a big man, strong and active—but there might have been an accident. Fletcher walked down the deck toward the control cabin. He passed the No. 1 hold, heaped with black-green barnacles. At the No. 2 hold the boom was winged out, with the grab engaged on a shelf, ready to hoist it clear of the water.

The No. 3 hold was still unladen. The control cabin was empty.

Carl Raight was nowhere aboard the barge.

He might have been taken off by helicopter or launch, or he might have fallen over the side. Fletcher made a slow check of the dark water in all directions. He suddenly leaned over the side, trying to see through the surface reflections. But the pale

shape under the water was a dekabrach, long as a man, sleek as satin, moving quietly about its business.

Fletcher looked thoughtfully to the northeast, where the Pelagic Recoveries raft floated behind a curtain of pink murk. It was a new venture, only three months old, owned and operated by Ted Chrystal, former biochemist on the Bio-Minerals raft. The Sabrian Ocean was inexhaustible; the market for metal was insatiable; the two rafts were in no sense competitors. By no stretch of imagination could Fletcher conceive Chrystal or his men attacking Carl Raight.

He must have fallen overboard.

Fletcher returned to the control cabin, climbed the ladder to the flying bridge on top. He made a last check of the water around the barge, although he knew it to be a useless gesture—the current, moving through the gap at a steady two knots, would have swept Raight's body out over the Deeps. Fletcher scanned the horizon. The line of shelves dwindled away into the pink gloom. The mast on the Bio-Minerals raft marked the sky to the northwest. The Pelagic Recoveries raft could not be seen. There was no living creature in sight.

The screen signal sounded from the cabin. Fletcher went inside. Blue Murphy was calling from the raft. "What's the news?"

"None whatever," said Fletcher.

"What do you mean?"

"Raight's not out here."

The big red face creased. "Just who is out there?"

"Nobody. It looks like Raight fell over the side."

Murphy whistled. There seemed nothing to say. Finally he asked, "Any idea how it happened?"

Fletcher shook his head. "I can't figure it out."

Murphy licked his lips. "Maybe we ought to close down."

"Why?" asked Fletcher.

"Well—reverence to the dead, you might say."

Fletcher grinned crookedly. "We might as well keep running."

"Just as you like. But we're low on the barnacles."

"Carl loaded a hold and a half—" Fletcher hesitated, heaved a deep sigh. "I might as well shake in a few more shelves."

Murphy winced. "It's a squeamish business, Sam. You haven't a nerve in your body."

"It doesn't make any difference to Carl now," said Fletcher. "We've got to scrape barnacles sometime. There's nothing to be gained by moping."

"I suppose you're right," said Murphy dubiously.

"I'll be back in a couple hours."

"Don't go overboard like Raight now."

The screen went blank. Fletcher reflected that he was in charge, superintendent of the raft, until the arrival of the new crew, a month away. Responsibility, which he did not particularly want, was his.

He went slowly back out on deck, climbed into the winch pulpit. For an hour he pulled sections of shelves

from the sea, suspended them over the hold while scraper arms wiped off the black-green clusters, then slid the shelves back into the ocean. Here was where Raight had been working just before his disappearance. How could he have fallen overboard from the winch pulpit?

Uneasiness inched along Fletcher's nerves, up into his brain. He shut down the winch, climbed down from the pulpit. He stopped short, staring at the rope on the deck.

It was a strange rope—glistening, translucent, an inch thick. It lay in a loose loop on the deck and one end led over the side. Fletcher started down, then hesitated. Rope? Certainly none of the barge's equipment.

Careful, thought Fletcher.

A hand-scraper hung on the king-post, a tool like a small adze. It was used for manual scraping of the shelves, if for some reason the automatic scrapers failed. It was two steps distant, across the rope. Fletcher stepped down to the deck. The rope quivered; the loop contracted, snapped around Fletcher's ankles.

Fletcher lunged, caught hold of the scraper. The rope gave a cruel jerk; Fletcher sprawled flat on his face and the scraper jarred out of his hands. He kicked, struggled, but the rope drew him easily toward the gunwhale. Fletcher made a convulsive grab for the scraper, barely reached it. The rope was lifting his ankles, to pull him over the rail. Fletcher strained forward, hacked, again and again. The rope sagged, fell apart, snaked over the side.

Fletcher gained his feet, staggered to the rail. Down into the water slid the rope, out of sight among the oily reflections of the sky. Then, for half a second, a wave-front held itself perpendicular to Fletcher's line of vision. Three feet under the surface swam a dekabrach. Fletcher saw the pink-golden cluster of arms, radiating like the arms of a starfish, the black patch at their core which might be an eye.

Fletcher drew back from the gunwhale, puzzled, frightened, oppressed by the nearness of death. He cursed his stupidity, his reckless carelessness; how could he have been so undiscerning as to remain out here loading the barge? It was clear from the first that Raight had never died by accident. Something had killed Raight, and Fletcher had invited it to kill him too. He limped to the control cabin, started the pumps. Water sucked in through the bow orifice, thrust out through the vents. The barge moved out away from the shelves; Fletcher set the course to northwest, toward Bio-Minerals, then went out on deck.

Day was almost at an end; the sky was darkening to maroon; the gloom grew thick as bloody water. Geidion, a dull red giant, largest of Sabria's two suns, dropped out of the sky. For a few minutes only the light from blue-green Atreus played on the clouds. The gloom changed its quality to pale green, which by some illusion seemed brighter than the previous pink. Atreus sank and the sky went dark.

Ahead shone the Bio-Minerals

mast-head light, climbing into the sky as the barge approached. Fletcher saw the black shapes of men outlined against the glow. The entire crew was waiting for him: the two operators, Agostino and Murphy, Mahlberg the barge-tender, Damon the biochemist, Dave Jones the steward, Manners the technician, Hans Heinz the engineer.

Fletcher docked the barge, climbed the soft stairs hacked from the wadded seaweed, stopped in front of the silent men. He looked from face to face. Waiting on the raft they had felt the strangeness of Raight's death more vividly than he had; so much showed in their expressions.

Fletcher, answering the unspoken question, said, "It wasn't an accident. I know what happened."

"What?" someone asked.

"There's a thing like a white rope," said Fletcher. "It slides up out of the sea. If a man comes near it, it snaps around his leg and pulls him overboard."

Murphy asked in a hushed voice, "You're sure?"

"It just about got me."

Damon the biochemist asked in a skeptical voice, "A live rope?"

"I suppose it might have been alive."

"What else could it have been?"

Fletcher hesitated. "I looked over the side. I saw dekabrachs. One for sure, maybe two or three others."

There was silence. The men looked out over the water. Murphy asked in a wondering voice, "Then the dekabrachs are the ones?"

"I don't know," said Fletcher in a strained sharp voice. "A white rope, or fiber, nearly snared me. I cut it apart. When I looked over the side I saw dekabrachs."

The men made hushed noises of wonder and awe.

Fletcher turned away, started toward the mess hall. The men lingered on the dock, examining the ocean, talking in subdued voices. The lights of the raft shone past them, out into the darkness. There was nothing to be seen.

Later in the evening Fletcher climbed the stairs to the laboratory over the office, to find Eugene Damon busy at the micro-film viewer.

Damon had a thin long-jawed face, lank blond hair, a fanatic's eyes. He was industrious and thorough, but he worked in the shadow of Ted Chrystal, who had quit Bio-Minerals to bring his own raft to Sabria. Chrystal was a man of great ability. He had adapted the vanadium-sequestering sea-slug of Earth to Sabrian waters; he had developed the tantalum-barnacle from a rare and sickly species into the hardy high-yield producer that it was. Damon worked twice the hours that Chrystal had put in, and while he performed his routine duties efficiently, he lacked the flair and imaginative resource which Chrystal used to leap from problem to solution without apparent steps in between.

He looked up when Fletcher came into the lab, then applied himself once more to the micro-screen.

Fletcher watched a moment.

"What are you looking for?" he asked presently.

Damon responded in the ponderous, slightly pedantic manner that sometimes amused, sometimes irritated, Fletcher. "I've been searching the index to identify the long white 'rope' which attacked you."

Fletcher made a noncommittal sound, went to look at the settings on the micro-file throw-out. Damon had coded for "long," "thin," dimension classification "E, F, G." On these instructions, the selector, scanning the entire roster of Sabrian life forms, had pulled the cards of seven organisms.

"Find anything?" Fletcher asked.

"Not so far." Damon slid another card into the viewer. "Sabrian Annelid, RRS-4924," read the title, and on the screen appeared a schematic outline of a long segmented worm. The scale showed it to be about two and a half meters long.

Fletcher shook his head. "The thing that got me was four or five times that long. And I don't think it was segmented."

"That's the most likely of the lot so far," said Damon. He turned a quizzical glance up at Fletcher. "I imagine you're pretty sure about this . . . long white marine 'rope'?"

Fletcher ignored him, scooped up the seven cards, dropped them back into the file, looked in the code book, reset the selector.

Damon had the codes memorized and was able to read directly off the dials. 'Appendages'—'long'—'dimensions D, E, F, G'."

The selector kicked three cards into the viewer.

The first was a pale saucer which swam like a skate, trailing four long whiskers. "That's not it," said Fletcher.

The second was a black bullet-shaped water-beetle, with a posterior flagellum.

"Not that one."

The third was a kind of mollusk, with a plasm based on selenium, silicon, fluorine and carbon. The shell was a hemisphere of silicon carbide, with a hump from which protruded a thin prehensile tendril.

The creature bore the name "Stryzkal's Monitor," after Esteban Stryzkal, the famous pioneer taxonomist of Sabria.

"That might be the guilty party," said Fletcher.

"It's not mobile," objected Damon. "Stryzkal finds it anchored to the North Shallows pegmatite dikes, in conjunction with the dekabrach colonies."

Fletcher was reading the descriptive material. " 'The feeler is elastic without observable limit, and apparently functions as a food-gathering, spore-disseminating, exploratory organ. The monitor typically is found near the dekabrach colonies. Symbiosis between the two life forms is not impossible.' "

Damon looked at him questioningly. "Well?"

"I saw some dekabrachs out along the shelves."

"You can't be sure you were attacked by a monitor," Damon said

dubiously. "After all, they don't swim."

"So they don't," said Fletcher, "according to Stryzkal."

Damon started to speak, then noticing Fletcher's expression, said in a subdued voice, "Of course there's room for error. Not even Stryzkal could work out much more than a summary of planetary life."

Fletcher had been reading the screen. "Here's Chrystal's analysis of the one he brought up."

They studied the elements and primary compounds of a Stryzkal Monitor's constitution.

"Nothing of commercial interest," said Fletcher.

Damon was absorbed in a personal chain of thought. "Did Chrystal actually go down and trap a monitor?"

"That's right. In the water-bug. He spent lots of time underwater."

"Everybody to their own methods," said Damon shortly.

Fletcher dropped the cards back in the file. "Whether you like him or not, he's a good field man. Give the devil his due."

"It seems to me that the field phase is over and done with," muttered Damon. "We've got the production line set up; it's a full-time job trying to increase the yield. Of course I may be wrong."

Fletcher laughed, slapped Damon on the skinny shoulder. "I'm not finding fault, Gene. The plain fact is that there's too many avenues for one man to explore. We could keep four men busy."

"Four men?" said Damon. "A dozen is more like it. Three different protoplasmic phases on Sabria, to the single carbon group on Earth! Even Stryzkal only scratched the surface!"

He watched Fletcher for a while, then asked curiously: "What are you after now?"

Fletcher was once more running through the index. "What I came in here to check. The dekabrachs."

Damon leaned back in his chair. "Dekabrachs? Why?"

"There's lots of things about Sabria we don't know," said Fletcher mildly. "Have you ever been down to look at a dekabrach colony?"

Damon compressed his mouth. "No. I certainly haven't."

Fletcher dialed for the dekabrach card.

It snapped out of the file into the viewer. The screen showed Stryzkal's original photo-drawing, which in many ways conveyed more information than the color stereos. The specimen depicted was something over six feet long, with a pale seallike body terminating in three propulsive vanes. At the head radiated the ten arms from which the creature derived its name—flexible members eighteen inches long, surrounding the black disk which Stryzkal assumed to be an eye.

Fletcher skimmed through the rather sketchy account of the creature's habitat, diet, reproductive methods, and protoplasmic classification. He frowned in dissatisfaction. "There's not much information here—considering that they're one of the more important species. Let's look at the anatomy."

The dekabrach's skeleton was based on an anterior dome of bone, three flexible cartilaginous vertebra, each terminating in a propulsive vane.

The information on the card came to an end. "I thought you said Chrystal made observations on the dekabrachs," growled Damon.

"So he did."

"If he's such a howling good field man, where's his data?"

Fletcher grinned. "Don't blame me, I just work here." He put the card through the screen again.

Under General Comments, Stryzkal had noted, "Dekabrachs appear to belong in the Sabrian Class A group, the silico-carbo-nitride phase, although they deviate in important respects." He had added a few lines of speculation regarding dekabrach relationships to other Sabrian species.

Chrystal merely made the comment, "Checked for commercial application; no specific recommendation."

Fletcher made no comment.

"How closely did he check?" asked Damon.

"In his usual spectacular way. He went down in the water-bug, harpooned one of them, dragged it to the laboratory. Spent three days dissecting it."

"Precious little he's noted here," grumbled Damon. "If I worked three days on a new species like the dekabrachs, I could write a book."

They watched the information repeat itself.

Damon stabbed out with his long bony finger. "Look! That's been blanked over. See those black triangles in the margin? Cancellation marks!"

Fletcher rubbed his chin. "Stranger and stranger."

"It's downright mischievous," Damon cried indignantly, "erasing material without indicating motive or correction."

Fletcher nodded slowly. "It looks like somebody's going to have to consult Chrystal." He considered. "Well —why not now?" He descended to the office, called the Pelagic Recoveries raft.

Chrystal himself appeared on the screen. He was a large blond man with a blooming pink skin and an affable innocence that camouflaged the directness of his mind; his plumpness similarly disguised a powerful musculature. He greeted Fletcher with cautious heartiness. "How's it going on Bio-Minerals? Sometimes I wish I was back with you fellows—this working on your own isn't all it's cracked up to be."

"We've had an accident over here," said Fletcher. "I thought I'd better pass on a warning."

"Accident?" Chrystal looked anxious. "What's happened?"

"Carl Raight took the barge out—and never came back."

Chrystal was shocked. "That's terrible! How . . . why—"

"Apparently something pulled him in. I think it was a monitor mollusk —Stryzkal's Monitor."

Chrystal's pink face wrinkled in puzzlement. "A monitor? Was the barge over shallow water? But there wouldn't be water that shallow. I don't get it."

"I don't either."

Chrystal twisted a cube of white metal between his fingers. "That's certainly strange. Raight must be—dead?"

Fletcher nodded somberly. "That's the presumption. I've warned everybody here not to go out alone; I thought I'd better do the same for you."

"That's decent of you, Sam." Chrystal frowned, looked at the cube of metal, put it down. "There's never been trouble on Sabria before."

"I saw dekabrachs under the barge. They might be involved somehow."

Chrystal looked blank. "Dekabrachs? They're harmless enough."

Fletcher nodded noncommittally. "Incidentally, I tried to check on dekabrachs in the micro-library. There wasn't much information. Quite a bit of material has been cancelled out."

Chrystal raised his pale eyebrows. "Why tell me?"

"Because you might have done the cancelling."

Chrystal looked aggrieved. "Now why should I do something like that? I worked hard for Bio-Minerals, Sam —you know that as well as I do. Now I'm trying to make money for myself. It's no bed of roses, I'll tell you." He touched the cube of white metal, then noticing Fletcher's eyes on it, pushed it to the side of his desk,

against Cosey's "Universal Handbook of Constants and Physical Relationships."

After a pause Fletcher asked, "Well, did you or didn't you blank out part of the dekabrach story?"

Chrystal frowned in deep thought. "I might have cancelled one or two ideas that turned out bad—nothing very important. I have a hazy idea that I pulled them out of the bank."

"Just what were those ideas?" Fletcher asked in a sardonic voice.

"I don't remember offhand. Something about feeding habits, probably. I suspected that the deks ingested plankton, but that doesn't seem to be the case."

"No?"

"They browse on under-water fungus that grows on the coral banks. That's my best guess."

"Is that all you cut out?"

"I can't think of anything more."

Fletcher's eyes went back to the cube of metal. He noticed that it covered the handbook title from the angle of the V in "Universal" to the center of the O in "of." "What's that you've got on your desk, Chrystal? Interesting yourself in metallurgy?"

"No, no," said Chrystal. He picked up the cube, looked at it critically. "Just a bit of alloy. I'm checking it for resistance to reagents. Well, thanks for calling, Sam."

"You don't have any personal ideas on how Raight got it?"

Chrystal looked surprised. "Why on earth do you ask me?"

"You know more about the dekabrachs than anyone else on Sabria."

"I'm afraid I can't help you, Sam."

Fletcher nodded. "Good night."

"Good night, Sam."

Fletcher sat looking at the blank screen. Monitor mollusks — dekabrachs — the blanked micro-film. There was a drift here whose direction he could not identify. The dekabrachs seemed to be involved, and by association, Chrystal. Fletcher put no credence in Chrystal's protestations; he suspected that Chrystal lied as a matter of policy, on almost any subject. Fletcher's mind went to the cube of metal. Chrystal had seemed rather too casual, too quick to brush the matter aside. Fletcher brought out his own "Handbook." He measured the distance between the fork of the V and the center of the O: 4.9 centimeters. Now, if the block represented a kilogram mass, as was likely with such sample blocks—Fletcher calculated. In a cube, 4.9 centimeters on a side, were 119 cc. Hypothesizing a mass of 1000 grams, the density worked out to 8.4 grams per cc.

Fletcher looked at the figure. In itself it was not particularly suggestive. It might be one of a hundred alloys. There was no point in going too far on a string of hypotheses—still, he looked in the "Handbook." Nickel, 8.6 grams per cc. Cobalt, 8.7 grams per cc. Niobium, 8.4 grams per cc.

Fletcher sat back, considered. Niobium? An element costly and tedious to synthesize, with limited natural sources and an unsatisfied market. The idea was stimulating. Had Chrys-

tal developed a biological source of niobium? If so, his fortune was made.

Fletcher relaxed in his chair. He felt done in—mentally and physically. His mind went to Carl Raight. He pictured the body drifting loose and haphazard through the night, sinking through miles of water into places where light would never reach. Why had Carl Raight been pillaged of life?

Fletcher began to ache with anger and frustration, at the futility, the indignity of Raight's passing. Carl Raight was too good a man to be dragged to his death into the dark ocean of Sabria.

Fletcher jerked himself upright, marched out of the office, up the steps to the laboratory.

Damon was still busy with his routine work. He had three projects underway: two involving the sequestering of platinum by species of Sabrian algae; the third an attempt to increase the rhenium absorption of an Alphard-Alpha flat-sponge. In each case his basic technique was the same: subjecting succeeding generations to an increasing concentration of metallic salt, under conditions favoring mutation. Certain of the organisms would presently begin to make functional use of the metal; they would be isolated and transferred to Sabrian brine. A few might survive the shock; some might adapt to the new conditions and begin to absorb the now necessary element.

By selective breeding the desirable qualities of these latter organisms would be intensified; they would then be cultivated on a large-scale basis and the inexhaustible Sabrian waters would presently be made to yield another product.

Coming into the lab, Fletcher found Damon arranging trays of algae cultures in geometrically exact lines. He looked rather sourly over his shoulder at Fletcher.

"I talked to Chrystal," said Fletcher.

Damon became interested. "What did he say?"

"He says he might have wiped a few bad guesses off the film."

"Ridiculous," snapped Damon.

Fletcher went to the table, looked thoughtfully along the row of algae cultures. "Have you run into any niobium on Sabria, Gene?"

"Niobium? No. Not in any appreciable concentration. There are traces in the ocean, naturally. I believe one of the corals shows a set of niobium lines." He cocked his head with birdlike inquisitiveness. "Why do you ask?"

"Just an idea, wild and random."

"I don't suppose Chrystal gave you any satisfaction?"

"None at all."

"Then what's the next move?"

Fletcher hitched himself up on the table. "I'm not sure. There's not much I can do. Unless—" he hesitated.

"Unless what?"

"Unless I make an underwater survey, myself."

Damon was appalled. "What do you hope to gain by that?"

Fletcher smiled. "If I knew, I wouldn't need to go. Remember, Chrystal went down, then came back up and stripped the micro-file."

"I realize that," said Damon. "Still, I think it's rather . . . well, foolhardy, after what's happened."

"Perhaps, perhaps not." Fletcher slid off the table to the deck. "I'll let it ride till tomorrow, anyway."

He left Damon making out his daily check sheet, descended to the main deck.

Blue Murphy was waiting at the foot of the stairs. Fletcher said, "Well, Murphy?"

The round red face displayed a puzzled frown. "Agostino up there with you?"

Fletcher stopped short. "No."

"He should have relieved me half an hour ago. He's not in the dormitory; he's not in the mess hall."

"Good God," said Fletcher, "another one?"

Murphy looked over his shoulder at the ocean. "They saw him about an hour ago in the mess hall."

"Come on," said Fletcher. "Let's search the raft."

They looked everywhere—processing house, the cupola on the mast, all the nooks and crannies a man might take it into his head to explore. The barges were all at dock; the launch and catamaran swung at their moorings; the helicopter hulked on the deck with drooping blades.

Agostino was nowhere aboard the raft. No one knew where Agostino had gone; no one knew exactly when he had left.

The crew of the raft collected in the mess hall, making small nervous motions, looking out the portholes over the ocean.

Fletcher could think of very little to say. "Whatever is after us—and we don't know what it is—it can surprise us and it's watching. We've got to be careful — more than careful!"

Murphy pounded his fist softly on the table. "But what can we do? We can't just stand around like silly cows!"

"Sabria is theoretically a safe planet," said Damon. "According to Stryzkal and the Galactic Index, there are no hostile life forms here."

Murphy snorted, "I wish old Stryzkal was here now to tell me."

"He might be able to theorize back Raight and Agostino." Dave Jones looked at the calendar. "A month to go."

"We'll only run one shift," said Fletcher, "until we get replacements."

"Call them reinforcements," muttered Mahlberg.

"Tomorrow," said Fletcher, "I'm going to take the water-bug down, look around, and get an idea what's going on. In the meantime, everybody better carry hatchets or cleavers."

There was soft sound on the windows, on the deck outside. "Rain," said Mahlberg. He looked at the clock on the wall. "Midnight."

The rain hissed through the air, drummed on the walls; the decks ran with water and the mast-head lights

glared through the slanting streaks.

Fletcher went to the streaming windows, looked toward the process house. "I guess we better button up for the night. There's no reason to—" he squinted through the window, then ran to the door and out into the rain.

Water pelted into his face, he could see very little but the glare of the lights in the rain. And a hint of white along the shining gray-black of the deck, like an old white plastic hose.

A snatch at his ankles: his feet were yanked from under him. He fell flat upon the streaming metal.

Behind him came the thud of feet; there were excited curses, a clang and scrape; the grip on Fletcher's ankles loosened.

Fletcher jumped up, staggered back against the mast. "Something's in the process house," he yelled.

The men pounded off through the rain; Fletcher came after.

But there was nothing in the process house. The doors were wide; the rooms were bright. The squat pulverizers stood on either hand, behind were the pressure tanks, the vats, the pipes of six different colors.

Fletcher pulled the master switch; the hum and grind of the machinery died. "Let's lock up and get back to the dormitory."

Morning was the reverse of evening; first the green gloom of Atreus, warming to pink as Geidion rose behind the clouds. It was a blustery day, with squalls trailing dark curtains all around the compass.

Fletcher ate breakfast, dressed in a skin-tight coverall threaded with heating-filaments, then a waterproof garment with a plastic head-dome.

The water-bug hung on davits at the east edge of the raft, a shell of transparent plastic with the pumps sealed in a metal cell amidships. Submerging, the hull filled with water through valves, which then closed; the bug could submerge to four hundred feet, the hull resisting about half the pressure, the enclosed water the rest. The effect on the passenger was pressure of two hundred feet—safely short of depth-delirium.

Fletcher lowered himself into the cockpit; Murphy connected the hoses from the air tanks to Fletcher's helmet, then screwed the port shut. Mahlberg and Hans Heinz winged out the davits. Murphy went to stand by the hoist-control; for a moment he hesitated, looking from the dark pink-dappled water to Fletcher, and back at the water.

Fletcher waved his hand. "Lower away." His voice came from the loudspeaker on the bulkhead behind them.

Murphy swung the handle. The bug eased down. Water gushed in through the valves, up around Fletcher's body, over his head. Bubbles rose from the helmet exhaust valve.

Fletcher tested the pumps, then cast off the grapples. The bug slanted down into the water.

Murphy sighed. "He's got more nerve than I'm ever likely to have."

"He can get away from whatever's after him," said Damon. "He might

well be safer than we are here on the raft."

Murphy clapped him on the shoulder. "Damon, my lad — you can climb. Up on top of the mast you'll be safe; it's unlikely that they'll come there to tug you into the water." Murphy raised his eyes to the cupola a hundred feet over the deck. "And I think that's where I'd take myself—if only someone would bring me my food."

Heinz pointed to the water. "There go the bubbles. He went under the raft. Now he's headed north."

The day became stormy. Spume blew over the raft, and it meant a drenching to venture out on deck. The clouds thinned enough to show the outlines of Geidion and Atreus, a blood-orange and a lime.

Suddenly the winds died; the ocean flattened into an uneasy calm. The crew sat in the mess hall drinking coffee, talking in staccato uneasy voices.

Damon became restless and went up to his laboratory. He came running back down into the mess hall.

"Dekabrachs—they're under the raft! I saw them from the observation deck!"

Murphy shrugged. "They're safe from me."

"I'd like to get hold of one," said Damon. "Alive."

"Don't we have enough trouble already?" growled Dave Jones.

Damon explained patiently. "We know nothing about dekabrachs. They're a highly developed species. Chrystal destroyed all the data we had, and I should have at least one specimen."

Murphy rose to his feet. "I suppose we can scoop one up in a net."

"Good," said Damon. "I'll set up the big tank to receive it."

The crew went out on deck where the weather had turned sultry. The ocean was flat and oily; haze blurred sea and sky together in a smooth gradation of color, from dirty scarlet near the raft to pale pink overhead.

The boom was winged out, a parachute net was attached and lowered quietly into the water. Heinz stood by the winch; Murphy leaned over the rail, staring intently down into the water.

A pale shape drifted out from under the raft. "Lift!" bawled Murphy.

The line snapped taut; the net rose out of the water in a cascade of spray. In the center a six-foot dekabrach pulsed and thrashed, gill slits rasping for water.

The boom swung inboard; the net tripped; the dekabrach slid into the plastic tank.

It darted forward and backward; the plastic dented and bulged where it struck. Then it floated quiet in the center, head-tentacles folded back against the torso.

All hands crowded around the tank. The black eye-spot looked back through the transparent walls.

Murphy asked Damon, "Now what?"

"I'd like the tank lifted to the deck outside the laboratory where I can get at it."

"No sooner said than done."

The tank was hoisted and swung to the spot Damon had indicated; Damon went excitedly off to plan his research.

The crew watched the dekabrach for ten or fifteen minutes, then drifted back to the mess hall.

Time passed. Gusts of wind raked up the ocean into a sharp steep chop. At two o'clock the loud-speaker hissed; the crew stiffened, raised their heads.

Fletcher's voice came from the diaphragm. "Hello aboard the raft. I'm about two miles northwest. Stand by to haul me aboard."

"Hah!" cried Murphy, grinning. "He made it."

"I gave odds against him of four to one," Mahlberg said. "I'm lucky nobody took them."

"Get a move on; he'll be alongside before we're ready."

The crew trooped out to the landing. The water-bug came sliding over the ocean, its glistening back riding the dark disorder of the waters.

It slipped quietly up to the raft; grapples clamped to the plates fore and aft. The winch whined, the bug lifted from the water, draining its ballast of water.

Fletcher, in the cockpit, looked tense and tired. He climbed stiffly out of the bug, stretched, unzipped the waterproof suit, pulled off the helmet.

"Well, I'm back." He looked around the group. "Surprised?"

"I'd have lost money on you," Mahlberg told him.

"What did you find out?" asked Damon. "Anything?"

Fletcher nodded. "Plenty. Let me get into clean clothes. I'm wringing wet—sweat." He stopped short, looking up at the tank on the laboratory deck. "When did that come aboard?"

"We netted it about noon," said Murphy. "Damon wanted to look one over."

Fletcher stood looking up at the tank with his shoulders drooping.

"Something wrong?" asked Damon.

"No," said Fletcher. "We couldn't have it worse than it is already." He turned away toward the dormitory.

The crew waited for him in the mess hall; twenty minutes later he appeared. He drew himself a cup of coffee, sat down.

"Well," said Fletcher. "I can't be sure—but it looks as if we're in trouble."

"Dekabrachs?" asked Murphy.

Fletcher nodded.

"I knew it!" Murphy cried in triumph. "You can tell by looking at the blatherskites they're up to no good."

Damon frowned, disapproving of emotional judgments. "Just what is the situation?" he asked Fletcher. "At least, as it appears to you?"

Fletcher chose his words carefully. "Things are going on that we've been unaware of. In the first place, the dekabrachs are socially organized."

"You mean to say—they're intelligent?"

Fletcher shook his head. "I don't know for sure. It's possible. It's

equally possible that they live by instinct, like social insects."

"How in the world—" began Damon; Fletcher held up a hand. "I'll tell you just what happened; you can ask all the questions you like afterwards." He drank his coffee.

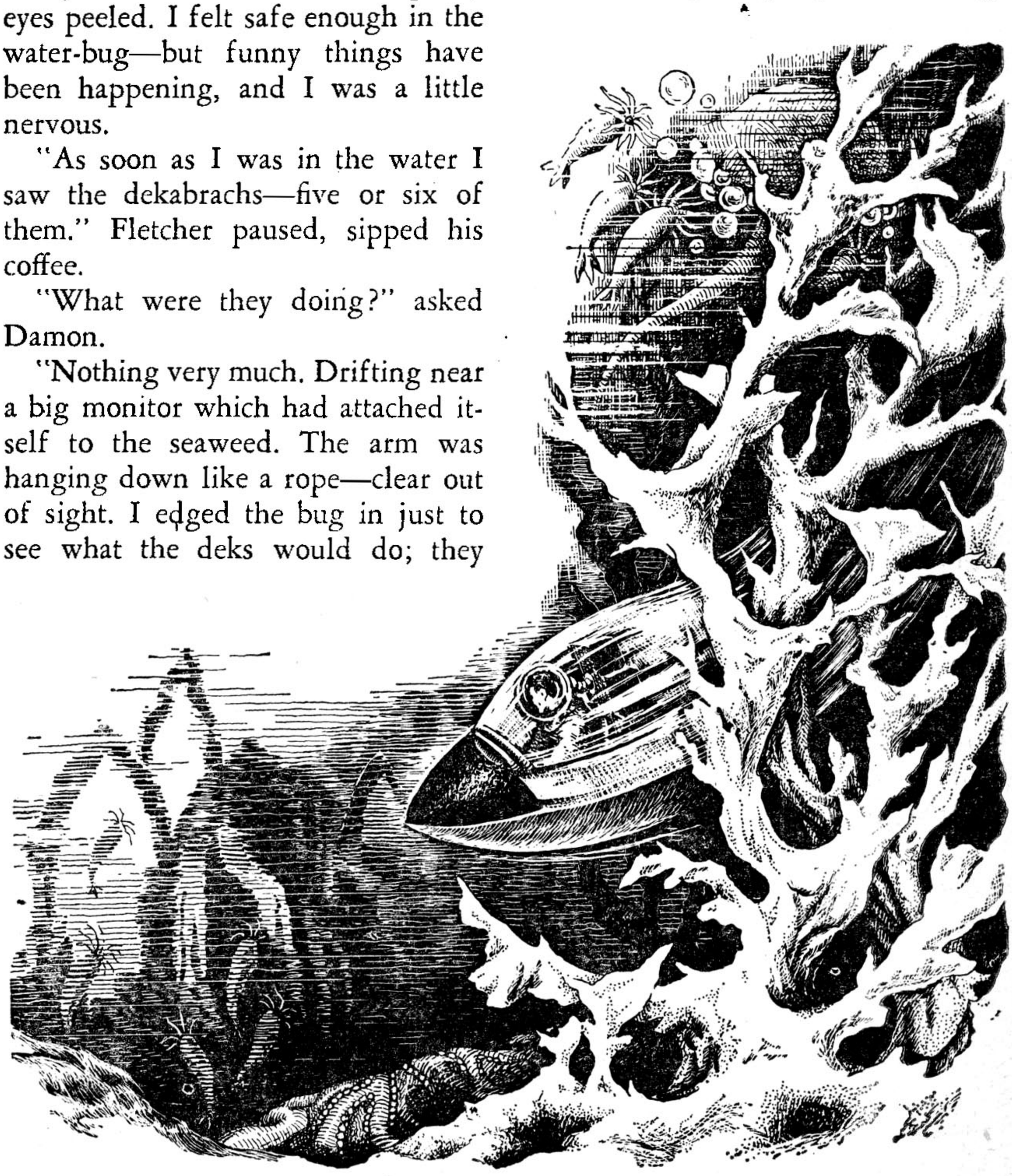
"When I went down under, naturally I was on the alert and kept my eyes peeled. I felt safe enough in the water-bug—but funny things have been happening, and I was a little nervous.

"As soon as I was in the water I saw the dekabrachs—five or six of them." Fletcher paused, sipped his coffee.

"What were they doing?" asked Damon.

"Nothing very much. Drifting near a big monitor which had attached itself to the seaweed. The arm was hanging down like a rope—clear out of sight. I edged the bug in just to see what the deks would do; they began backing away. I didn't want to waste too much time under the raft, so I swung off north, toward the Deeps. Halfway there I saw an odd thing; in fact I passed it, and swung around to take another look.

"There were about a dozen deks. They had a monitor—and this one was really big. A giant. It was hang-



ing on a set of balloons or bubbles—some kind of pods that kept it floating, and the deks were easing it along. In this direction."

"In this direction, eh?" mused Murphy.

"What did you do?" asked Manners.

"Well, perhaps it was all an innocent outing—but I didn't want to take any chances. The arm of this monitor would be like a hawser. I turned the bug at the bubbles, burst some, scattered the rest. The monitor dropped like a stone. The deks took off in different directions. I figured I'd won that round. I kept on going north, and pretty soon I came to where the slope starts down into the Deeps. I'd been traveling about twenty feet under; now I lowered to two hundred. I had to turn on the lights of course—this red twilight doesn't penetrate water too well." Fletcher took another gulp of coffee. "All the way across the Shallows I'd been passing over coral banks and dodging forests of kelp. Where the shelf slopes down to the Deeps the coral gets to be something fantastic—I suppose there's more water movement, more nourishment, more oxygen. It grows a hundred feet high, in spires and towers, umbrellas, platforms, arches—white, pale blue, pale green.

"I came to the edge of a cliff. It was a shock—one minute my lights were on the coral, all these white towers and pinnacles—then there was nothing. I was over the Deeps. I got a little nervous." Fletcher grinned. "Irrational, of course. I checked the fathometer—bottom was twelve thousand feet down. I still didn't like it, and turned around, swung back. Then I noticed lights off to my right. I turned my own off, moved in to investigate. The lights spread out as if I was flying over a city—and that's just about what it was."

"Dekabrachs?" asked Damon.

Fletcher nodded. "Dekabrachs."

"You mean—they built it themselves? Lights and all?"

Fletcher frowned. "That's what I can't be sure of. The coral had grown into shapes that gave them little cubicles to swim in and out of, and do whatever they'd want to do in a house. Certainly they don't need protection from the rain. They hadn't built these coral grottoes in the sense that we build a house—but it didn't look like natural coral either. It's as if they made the coral grow to suit them."

Murphy said doubtfully, "Then they're intelligent."

"No, not necessarily. After all, wasps build complicated nests with no more equipment than a set of instincts."

"What's your opinion?" asked Damon. "Just what impression does it give?"

Fletcher shook his head. "I can't be sure. I don't know what kind of standards to apply. 'Intelligence' is a word that means lots of different things, and the way we generally use it is artificial and specialized."

"I don't get you," said Murphy.

"Do you mean these deks are intelligent or don't you?"

Fletcher laughed. "Are men intelligent?"

"Sure. So they say, at least."

"Well, what I'm trying to get across is that we can't use man's intelligence as a measure of the dekabrach's mind. We've got to judge him by a different set of values—dekabrach values. Men use tools of metal, ceramic, fiber: inorganic stuff — at least, dead. I can imagine a civilization dependent upon living tools—specialized creatures the master-group uses for special purposes. Suppose the dekabrachs live on this basis? They force the coral to grow in the shape they want. They use the monitors for derricks or hoists, or snares, or to grab at something in the upper air."

"Apparently, then," said Damon. "you believe that the dekabrachs are intelligent."

Fletcher shook his head. "Intelligence is just a word—a matter of definition. What the deks do may not be susceptible to human definition."

"It's beyond me," said Murphy, settling back in his chair.

Damon pressed the subject. "I am not a metaphysicist or a semanticist. But it seems that we might apply, or try to apply, a crucial test."

"What difference does it make one way or the other?" asked Murphy.

Fletcher said, "It makes a big difference where the law is concerned."

"Ah," said Murphy, "the Doctrine of Responsibility."

Fletcher nodded. "We could be yanked off the planet for injuring or killing intelligent autochthones. It's been done."

"That's right," said Murphy. "I was on Alkaid Two when Graviton Corporation got in that kind of trouble."

"So if the deks are intelligent, we've got to watch our step. That's why I looked twice when I saw the dek in the tank."

"Well—are they or aren't they?" asked Mahlberg.

"There's one crucial test," Damon repeated.

The crew looked at him expectantly.

"Well?" asked Murphy. "Spill it."

"Communication."

Murphy nodded thoughtfully. "That seems to make sense." He looked at Fletcher. "Did you notice them communicating?"

Fletcher shook his head. "Tomorrow I'll take a camera out, and a sound recorder. Then we'll know for sure."

"Incidentally," said Damon, "why were you asking about niobium?"

Fletcher had almost forgotten. "Chrystal had a chunk on his desk. Or maybe he did—I'm not sure."

Damon nodded. "Well, it may be a coincidence, but the deks are loaded with it."

Fletcher stared.

"It's in their blood, and there's a strong concentration in the interior organs."

Fletcher sat with his cup halfway to his mouth. "Enough to make a profit on?"

Damon nodded. "Probably a hun-

dred grams or more in the organism."

"Well, well," said Fletcher. "That's very interesting indeed."

Rain roared down during the night; a great wind came up, lifting and driving the rain and spume. Most of the crew had gone to bed: all except Dave Jones the steward and Manners the radioman, who sat up over a chess board.

A new sound rose over wind and rain—a metallic groaning, a creaking discord that presently became too loud to ignore. Manners jumped to his feet, went to the window.

"The mast!"

Dimly it could be seen through the rain, swaying like a reed, the arc of oscillation increasing with each swing.

"What can we do?" cried Jones.

One set of guy-lines snapped. "Nothing now."

"I'll call Fletcher." Jones ran for the passage to the dormitory.

The mast gave a sudden jerk, poised long seconds at an unlikely angle, then toppled across the process house.

Fletcher appeared, stared out the window. With the mast-head light no longer shining down, the raft was dark and ominous. Fletcher shrugged, turned away. "There's nothing we can do tonight. It's worth a man's life to go out on that deck."

In the morning, examination of the wreckage revealed that two of the guy-lines had been sawed or clipped cleanly through. The mast, of light-weight construction, was quickly cut apart, and the twisted segments dragged to a corner of the deck. The raft seemed bald and flat.

"Someone or something," said Fletcher, "is anxious to give us as much trouble as possible." He looked across the leaden-pink ocean to where the Pelagic Recoveries raft floated beyond the range of vision.

"Apparently," said Damon, "you refer to Chrystal."

"I have suspicions."

Damon glanced out across the water. "I'm practically certain."

"Suspicion isn't proof," said Fletcher. "In the first place, what would Chrystal hope to gain by attacking us?"

"What would the dekabrachs gain?"

"I don't know," said Fletcher. "I'd like to find out." He went to dress himself in the submarine suit.

The water-bug was made ready. Fletcher plugged a camera into the external mounting, connected a sound-recorder to a sensitive diaphragm in the skin. He seated himself, pulled the blister over his head.

The water-bug was lowered into the ocean. It filled with water, and its glistening back disappeared under the surface.

The crew patched the roof of the process house, jury-rigged an antenna.

The day passed; twilight came, and plum-colored evening.

The loud-speaker hissed and sputtered; Fletcher's voice, tired and tense, said, "Stand by; I'm coming in."

The crew gathered by the rail, straining their eyes through the dusk.

One of the dully glistening wave-fronts held its shape, drew closer, and became the water-bug.

The grapples were dropped; the water-bug drained its ballast and was hoisted into the chocks.

Fletcher jumped down to the deck, leaned limply against one of the davits. "I've had enough submerging to last me a while."

"What did you find out?" Damon asked anxiously.

"I've got it all on film. I'll run it off as soon as my head stops ringing."

Fletcher took a hot shower, then came down to the mess hall and ate the bowl of stew Jones put in front of him, while Manners transferred the film Fletcher had shot from camera to projector.

"I've made up my mind to two things," said Fletcher. "First — the deks are intelligent. Second, if they communicate with each other, it's by means imperceptible to human beings."

Damon blinked, surprised and dissatisfied. "That's almost a contradiction."

"Just watch," said Fletcher. "You can see for yourself."

Manners started the projector; the screen went bright.

"The first few feet show nothing very much," said Fletcher. "I drove directly out to the end of the shelf, and cruised along the edge of the Deeps. It drops away like the end of the world—straight down. I found a big colony about ten miles west of the one I found yesterday — almost a city."

" 'City' implies civilization," Damon asserted in a didactic voice.

Fletcher shrugged. "If civilization means manipulation of environment —somewhere I've heard that definition—they're civilized."

"But they don't communicate?"

"Check the film for yourself."

The screen was dark with the color of the ocean. "I made a circle out over the Deeps," said Fletcher, "turned off my lights, started the camera and came in slow."

A pale constellation appeared in the center of the screen, separated into a swarm of sparks. They brightened and expanded; behind them appeared the outlines, tall and dim, of coral minarets, towers, spires and spikes. They defined themselves as Fletcher moved closer. From the screen came Fletcher's recorded voice. "These formations vary in height from fifty to two hundred feet; along a front of about half a mile."

The picture expanded. Black holes showed on the face of the spires; pale dekabrach-shapes swam quietly in and out. "Notice," said the voice, "the area in front of the colony. It seems to be a shelf, or a storage yard. From up here it's hard to see; I'll drop down a hundred feet or so."

The picture changed; the screen darkened. "I'm dropping now — depth-meter reads three hundred sixty feet. . . Three eighty. . . I can't see too well; I hope the camera is getting it all."

Fletcher commented. "You're seeing it better now than I could; the luminous areas in the coral don't shine too strongly down there."

The screen showed the base of the coral structures and a nearly level bench fifty feet wide. The camera took a quick swing, peered down over the verge, into blackness.

"I was curious," said Fletcher. "The shelf didn't look natural. It isn't. Notice the outlines on down? They're just barely perceptible. The shelf is artificial—a terrace, a front porch."

The camera swung back to the bench, which now appeared to be marked off into areas vaguely differentiated in color.

Fletcher's voice said, "Those colored areas are like plots in a garden—there's a different kind of plant, or weed, or animal on each of them. I'll come in closer. Here are monitors." The screen showed two or three dozen heavy hemispheres, then passed on to what appeared to be eels with saw edges along their sides, attached to the bench by a sucker. Next were float-bladders, then a great number of black cones with very long loose tails.

Damon said in a puzzled voice, "What keeps them there?"

"You'll have to ask the dekabrachs," said Fletcher.

"I would if I knew how."

"I still haven't seen them do anything intelligent," said Murphy.

"Watch," said Fletcher.

Into the field of vision swam a pair of dekabrachs, black eye-spots staring out of the screen at the men in the mess hall.

"Dekabrachs," came Fletcher's voice from the screen.

"Up to now, I don't think they noticed me," Fletcher himself commented. "I carried no lights, and made no contrast against the background. Perhaps they felt the pump."

The dekabrachs turned together, dropped sharply for the shelf.

"Notice," said Fletcher. "They saw a problem, and the same solution occurred to both at the same time. There was no communication."

The dekabrachs had diminished to pale blurs on one of the dark areas along the shelf.

"I didn't know what was happening," said Fletcher, "but I decided to move. And then—the camera doesn't show this—I felt bumps on the hull, as if someone were throwing rocks. I couldn't see what was going on until something hit the dome right in front of my face. It was a little torpedo, with a long nose like a knitting needle. I took off fast, before the deks tried something else."

The screen went black. Fletcher's voice said, "I'm out over the Deeps, running parallel with the edge of the Shallows." Indeterminate shapes swam across the screen, pale wisps blurred by watery distance. "I came back along the edge of the shelf," said Fletcher, "and found the colony I saw yesterday."

Once more the screen showed spires, tall structures, pale blue, pale green, ivory. "I'm going in close,"

came Fletcher's voice. "I'm going to look in one of those holes." The towers expanded; ahead was a dark hole.

"Right here I turned on the nose-light," said Fletcher. The black hole suddenly became a bright cylindrical chamber fifteen feet deep. The walls were lined with glistening colored globes, like Christmas tree ornaments. A dekabrach floated in the center of the chamber. Translucent tendrils ending in knobs extended from the chamber walls, and seemed to be punching and kneading the seal-smooth hide.

"I don't know what's going on," said Fletcher, "but the dek doesn't like me looking in on him."

The dekabrach backed to the rear of the chamber; the knobbed tendrils jerked away, into the walls.

"I looked into the next hole."

Another black hole became a bright chamber as the searchlight burnt in. A dekabrach floated quietly, holding a sphere of pink jelly before its eye. The wall-tendrils were not to be seen.

"This one didn't move," said Fletcher. "He was asleep or hypnotized or too scared. I started to take off—and there was the most awful thump. I thought I was a goner."

The screen gave a great lurch. Something dark hurtled past, and into the depths.

"I looked up," said Fletcher. "I couldn't see anything but about a dozen deks. Apparently they'd floated a big rock over me and dropped it. I started the pump and headed for home."

The screen went blank.

Damon was impressed. "I agree that they show patterns of intelligent behavior. Did you detect any sounds?"

"Nothing. I had the recorder going all the time. Not a vibration other than the bumps on the hull."

Damon's face was wry with dissatisfaction. "They must communicate somehow—how could they get along otherwise?"

"Not unless they're telepathic," said Fletcher. "I watched carefully. They make no sounds or motions to each other—none at all."

Manners asked, "Could they possibly radiate radio waves? Or infrared?"

Damon said glumly, "The one in the tank doesn't."

"Oh, come now," said Murphy, "are there no intelligent races that don't communicate?"

"None," said Damon. "They use different methods—sounds, signals, radiation—but all communicate."

"How about telepathy?" Heinz suggested.

"We've never come up against it; I don't believe we'll find it here," said Damon.

"My personal theory," said Fletcher, "is that they think alike, and don't need to communicate."

Damon shook his head dubiously.

"Assume that they work on a basis of communal empathy," Fletcher went on, "that this is the way they've evolved. Men are individualistic; they need speech. The deks are identical; they're aware of what's going on

without words." He reflected a few seconds. "I suppose, in a certain sense, they do communicate. For instance, a dek wants to extend the garden in front of its tower. It possibly waits till another dek comes near, then carries out a rock—indicating what it wants to do."

"Communication by example," said Damon.

"That's right—if you can call it communication. It permits a measure of coöperation—but clearly no small talk, no planning for the future or traditions of the past."

"Perhaps not even awareness of past or future; perhaps no awareness of time!" cried Damon.

"It's hard to estimate their native intelligence. It might be remarkably high, or it might be low; the lack of communication must be a terrific handicap."

"Handicap or not," said Mahlberg, "they've certainly got us on the run."

"And why?" cried Murphy, pounding the table with his big red fist. "That's the question. We've never bothered them. And all of a sudden, Raight's gone, and Agostino. Also our mast. Who knows what they'll think of tonight? Why? That's what I want to know."

"That," said Fletcher, "is a question I'm going to put to Ted Chrystal tomorrow."

Fletcher dressed himself in clean blue twill, ate a silent breakfast, and went out to the flight deck.

Murphy and Mahlberg had thrown the guy-lines off the helicopter and wiped the dome clean of salt-film.

Fletcher climbed into the cabin, twisted the inspection knob. Green light—everything in order.

Murphy said half-hopefully, "Maybe I better come with you, Sam —if there's any chance of trouble."

"Trouble? Why should there be trouble?"

"I wouldn't put much past Chrystal."

"I wouldn't either," said Fletcher. "But—there won't be any trouble."

He started the blades. The ram-tubes caught hold; the copter lifted, slanted up, away from the raft, and off into the northeast. Bio-Minerals became a bright tablet on the irregular wad of seaweed.

The day was dull, brooding, windless, apparently building up for one of the tremendous electrical storms which came every few weeks. Fletcher accelerated, thinking to get his errand over with as soon as possible.

Miles of ocean slid past; Pelagic Recoveries appeared ahead.

Twenty miles southwest from the raft, Fletcher overtook a small barge laden with raw material for Chrystal's macerators and leaching columns; he noticed that there were two men aboard, both huddled inside the plastic canopy. Pelagic Recoveries perhaps had its troubles too, thought Fletcher.

Chrystal's raft was little different from Bio-Minerals, except that the mast still rose from the central deck and there was activity in the process house. They had not shut down, whatever their troubles.

Fletcher landed on the flight deck. As he stopped the blades, Chrystal came out of the office—a big blond man with a round jocular face.

Fletcher jumped down to the deck. "Hello, Ted," he said in a guarded voice.

Chrystal approached with cheerful smile. "Hello, Sam! Long time since we've seen you." He shook hands briskly. "What's new at Bio-Minerals? Certainly too bad about Carl."

"That's what I want to talk about." Fletcher looked around the deck. Two of the crew stood watching. "Can we go to your office?

"Sure, by all means." Chrystal led the way to the office, slid back the door. "Here we are."

Fletcher entered the office. Chrystal walked behind his desk. "Have a seat." He sat down in his own chair. "Now—what's on your mind? But first, how about a drink? You like Scotch, as I recall."

"Not today, thanks." Fletcher shifted in his chair. "Ted, we're up against a serious problem here on Sabria, and we might as well talk plainly about it."

"Certainly," said Chrystal. "Go right ahead."

"Carl Raight's dead. And Agostino."

Chrystal's eyebrows rose in shock. "Agostino too? How?"

"We don't know. He just disappeared."

Chrystal took a moment to digest the information. Then he shook his head in perplexity. "I can't understand it. We've never had trouble like this before."

"Nothing happening over here?"

Chrystal frowned. "Well—nothing to speak of. Your call put us on our guard."

"The dekabrachs seem to be responsible."

Chrystal blinked and pursed his lips, but said nothing.

"Have you been going out after dekabrachs, Ted?"

"Well now, Sam—" Chrystal hesitated, drumming his fingers on the desk. "That's hardly a fair question. Even if we were working with dekabrachs—or polyps or club-moss or wire-eels—I don't think I'd want to say, one way or the other."

"I'm not interested in your business secrets," said Fletcher. "The point is this: the deks appear to be an intelligent species. I have reason to believe that you're processing them for their niobium content. Apparently they're doing their best to retaliate and don't care who they hurt. They've killed two of our men. I've got a right to know what's going on."

Chrystal nodded. "I can understand your viewpoint—but I don't follow your chain of reasoning. For instance, you told me that a monitor had done for Raight. Now you say dekabrach. Also, what leads you to believe I'm going for niobium?"

"Let's not try to kid each other, Ted."

Chrystal looked shocked, then annoyed.

"When you were still working for Bio-Minerals," Fletcher went on,

"you discovered that the deks were full of niobium. You wiped all that information out of the files, got financial backing, built this raft. Since then you've been hauling in dekabrachs."

Chrystal leaned back, surveyed Fletcher coolly. "Aren't you jumping to conclusions?"

"If I am, all you've got to do is deny it."

"Your attitude isn't very pleasant, Sam."

"I didn't come here to be pleasant. We've lost two men; also our mast. We've had to shut down."

"I'm sorry to hear that—" began Chrystal.

Fletcher interrupted: "So far, Chrystal, I've given you the benefit of the doubt."

Chrystal was surprised. "How so?"

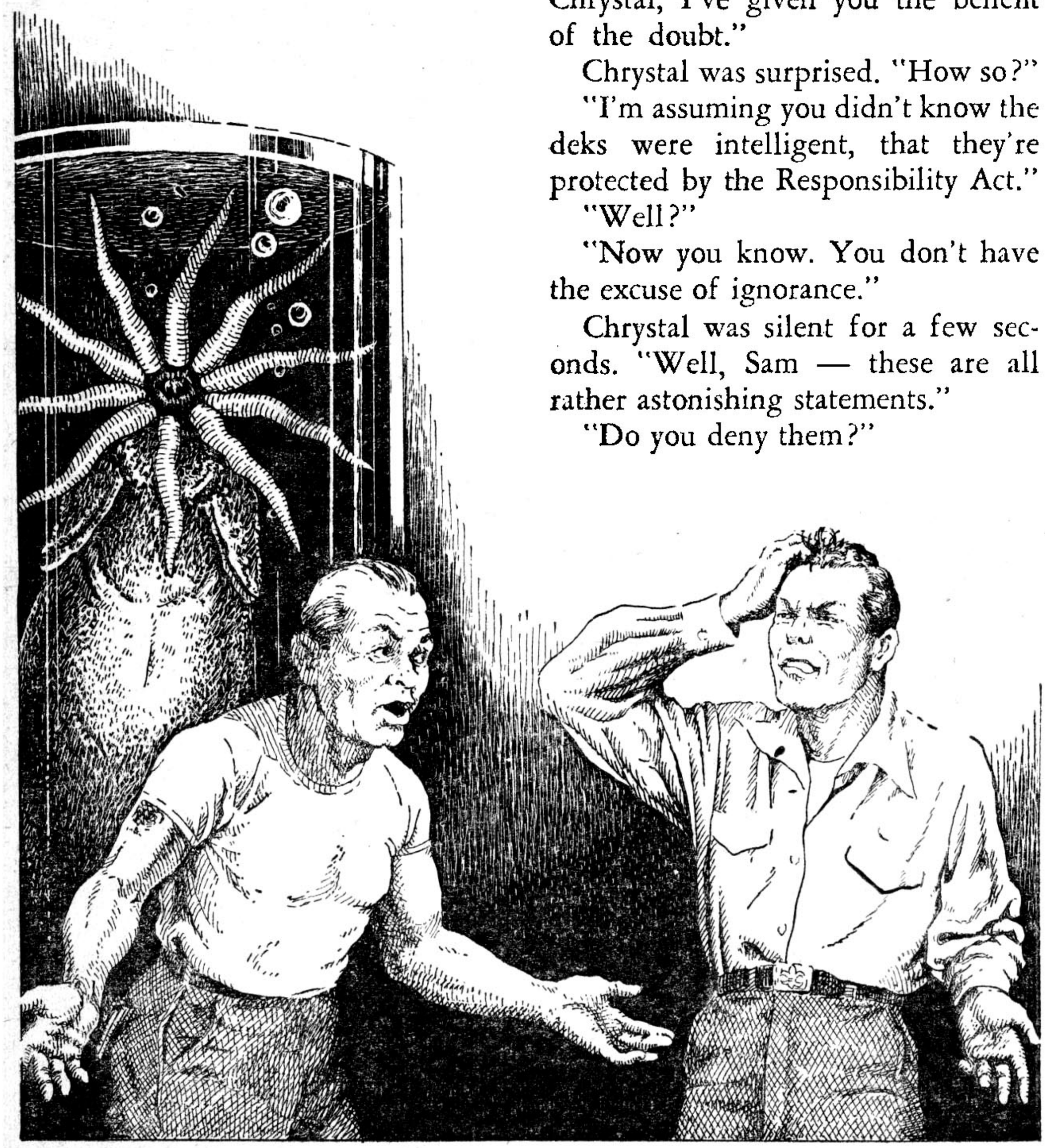
"I'm assuming you didn't know the deks were intelligent, that they're protected by the Responsibility Act."

"Well?"

"Now you know. You don't have the excuse of ignorance."

Chrystal was silent for a few seconds. "Well, Sam — these are all rather astonishing statements."

"Do you deny them?"



"Of course I do!" said Chrystal with a flash of spirit.

"And you're not processing dekabrach?"

"Easy now. After all, Sam, this is my raft. You can't come aboard and chase me back and forth. It's high time you understood it."

Fletcher drew himself a little away, as if Chrystal's mere proximity were unpleasant.

"You're not giving me a plain answer."

Chrystal leaned back in his chair, put his fingers together, puffed out his cheeks. "I don't intend to."

The barge that Fletcher had passed on his way was edging close to the raft. Fletcher watched it work against the mooring stage, snap its grapples. He asked, "What's on that barge?"

"Frankly, it's none of your business."

Fletcher rose to his feet, went to the window. Chrystal made uneasy protesting noises. Fletcher ignored him. The two barge-handlers had not emerged from the control cabin. They seemed to be waiting for a gangway which was being swung into position by the cargo boom.

Fletcher watched in growing curiosity and puzzlement. The gangway was built like a trough with high plywood walls.

He turned to Chrystal. "What's going on out there?"

Chrystal was chewing his lower lip, rather red in the face. "Sam, you came storming over here, making wild accusations, calling me dirty names—by implication—and I don't say a word. I try to allow for the strain you're under; I value the good will between our two outfits. I'll show you some documents that will prove once and for all—" he sorted through a sheaf of miscellaneous pamphlets.

Fletcher stood by the window, with half an eye for Chrystal, half for what was occurring out on deck.

The gangway was dropped into position; the barge-handlers were ready to disembark.

Fletcher decided to see what was going on. He started for the door.

Chrystal's face went stiff and cold. "Sam, I'm warning you, don't go out there!"

"Why not?"

"Because I say so."

Fletcher slid open the door; Chrystal made a motion to jump up from his chair; then he slowly sank back.

Fletcher walked out the door, crossed the deck toward the barge.

A man in the process house saw him through the window, and made urgent gestures.

Fletcher hesitated, then turned to look at the barge. A couple more steps and he could look into the hold. He stepped forward, craned his neck. From the corner of his eye, he saw the gestures becoming frantic. The man disappeared from the window.

The hold was full of limp white dekabrachs.

"Get back, you fool!" came a yell from the process house.

Perhaps a faint sound warned Fletcher; instead of backing away,

he threw himself to the deck. A small object flipped over his head from the direction of the ocean, with a peculiar fluttering buzz. It struck a bulkhead, dropped — a fishlike torpedo, with a long needlelike proboscis. It came flapping toward Fletcher, who rose to his feet and ran crouching and dodging back toward the office.

Two more of the fishlike darts missed him by inches; Fletcher hurled himself through the door into the office.

Chrystal had not moved from the desk. Fletcher went panting up to him. "Pity I didn't get stuck, isn't it?"

"I warned you not to go out there."

Fletcher turned to look across the deck. The barge-handlers ran down the troughlike gangway to the process house. A glittering school of dart-fish flickered up out of the water, struck at the plywood.

Fletcher turned back to Chrystal. "I saw dekabrachs in that barge. Hundreds of them."

Chrystal had regained whatever composure he had lost. "Well? What if there are?"

"You know they're intelligent as well as I do."

Chrystal smilingly shook his head.

Fletcher's temper was going raw. "You're ruining Sabria for all of us!"

Chrystal held up his hand. "Easy, Sam. Fish are fish."

"Not when they're intelligent and kill men in retaliation."

Chrystal wagged his head. "*Are* they intelligent?"

Fletcher waited until he could control his voice. "Yes. They are."

Chrystal reasoned with him. "How do you know they are? Have you talked with them?"

"Naturally I haven't talked with them."

"They display a few social patterns. So do seals."

Fletcher came up closer, glared down at Chrystal. "I'm not going to argue definitions with you. I want you to stop hunting dekabrach, because you're endangering lives aboard both our rafts."

Chrystal leaned back a trifle. "Now, Sam, you know you can't intimidate me."

"You've killed two men; I've escaped by inches three times now. I'm not running that kind of risk to put money in your pocket."

"You're jumping to conclusions," Chrystal protested. "In the first place you've never proved—"

"I've proved enough! You've got to stop, that's all there is to it!"

Chrystal slowly shook his head. "I don't see how you're going to stop me, Sam." He brought his hand up from under the desk; it held a small gun. "Nobody's going to bulldoze me, not on my own raft."

Fletcher reacted instantly, taking Chrystal by surprise. He grabbed Chrystal's wrist, banged it against the angle of the desk. The gun flashed, seared a groove in the desk, fell from Chrystal's limp fingers to the floor. Chrystal hissed and cursed, bent to recover it, but Fletcher leaped over the desk, pushed him over backward

in his chair. On the way Chrystal kicked at Fletcher's face, caught him a glancing blow on the cheek that sent Fletcher to his knees.

Both men dived for the gun; Fletcher reached it first, rose to his feet, backed to the wall. "Now we know where we stand."

"Put down that gun!"

Fletcher shook his head. "I'm putting you under arrest—civilian arrest. You're coming to Bio-Minerals until the inspector arrives."

Chrystal seemed dumfounded. "What?"

"I said I'm taking you to the Bio-Minerals raft. The inspector is due in three weeks, and I'll turn you over to him."

"You're crazy, Fletcher."

"Perhaps. But I'm taking no chances with you." Fletcher motioned with the gun. "Get going. Out to the copter."

Chrystal coolly folded his arms. "I'm not going to move. You can't scare me by waving a gun."

Fletcher raised his arm, sighted, pulled the trigger. The jet of fire grazed Chrystal's rump. Chrystal jumped, clapped his hand to the scorch.

"Next shot will be somewhat closer," said Fletcher.

Chrystal glared like a boar from a thicket. "You realize I can bring kidnaping charges against you?"

"I'm not kidnaping you. I'm placing you under arrest."

"I'll sue Bio-Minerals for everything they've got."

"Unless Bio-Minerals sues you first. Get going!"

The entire crew met the helicopter: Damon, Blue Murphy, Manners, Hans Heinz, Mahlberg and Dave Jones.

Chrystal jumped haughtily to the deck, surveyed the men with whom he had once worked. "I've got something to say to you men."

The crew watched him silently.

Chrystal jerked his thumb at Fletcher. "Sam's got himself in a peck of trouble. I told him I'm going to throw the book at him and that's what I'm going to do." He looked from face to face. "If you men help him, you'll be accessories. I advise you, take that gun away from him and fly me back to my raft."

He looked around the circle, but met only coolness and hostility. He shrugged angrily. "Very well, you'll be liable for the same penalties as Fletcher. Kidnaping is a serious crime, don't forget."

Murphy asked Fletcher. "What shall we do with the varmint?"

"Put him in Carl's room; that's the best place for him. Come on, Chrystal."

Back in the mess hall, after locking the door on Chrystal, Fletcher told the crew, "I don't need to tell you—be careful of Chrystal. He's tricky. Don't talk to him. Don't run any errands of any kind. Call me if he wants anything. Everybody got that straight?"

Damon asked dubiously, "Aren't we getting in rather deep water?"

"Do you have an alternative suggestion?" asked Fletcher. "I'm certainly willing to listen."

Damon thought. "Wouldn't he agree to stop hunting dekabrach?"

"No. He refused point-blank."

"Well," said Damon reluctantly, "I guess we're doing the right thing. But we've got to prove a criminal charge. The inspector won't care whether or not Chrystal's cheated Bio-Minerals."

Fletcher said, "If there's any backfire on this, I'll take full responsibility."

"Nonsense," said Murphy. "We're all in this together. I say you did just right. In fact, we ought to hand the sculpin over to the deks, and see what they'd say to him."

After a few minutes Fletcher and Damon went up to the laboratory to look at the captive dekabrach. It floated quietly in the center of the tank, the ten arms at right angles to its body, the black eye-area staring through the glass.

"If it's intelligent," said Fletcher, "it must be as interested in us as we are in it."

"I'm not so sure it's intelligent," said Damon stubbornly. "Why doesn't it try to communicate?"

"I hope the inspector doesn't think along the same lines," said Fletcher. "After all, we don't have an air-tight case against Chrystal."

Damon looked worried. "Bevington isn't a very imaginative man. In fact, he's rather official in his outlook."

Fletcher and the dekabrach examined each other. "I know it's intelligent—but how can I prove it?"

"If it's intelligent," Damon insisted doggedly, "it can communicate."

"If it can't," said Fletcher, "then it's our move."

"What do you mean?"

"We'll have to teach it."

Damon's expression became so perplexed and worried that Fletcher broke into laughter.

"I don't see what's funny," Damon complained. "After all, what you propose is . . . well, it's unprecedented."

"I suppose it is," said Fletcher. "But it's got to be done, nevertheless. How's your linguistic background?"

"Very limited."

"Mine is even more so."

They stood looking at the dekabrach.

"Don't forget," said Damon, "we've got to keep it alive. That means, we've got to feed it." He gave Fletcher a caustic glance. "I suppose you'll admit it eats."

"I know for sure it doesn't live by photosynthesis," said Fletcher. "There's just not enough light. I believe Chrystal mentioned on the micro-film that it ate coral fungus. Just a minute." He started for the door.

"Where are you going?"

"To check with Chrystal. He's certainly noted their stomach contents."

"He won't tell you," Damon said at Fletcher's back.

Fletcher returned ten minutes later.

"Well?" asked Damon in a skeptical voice.

Fletcher looked pleased with himself. "Coral fungus mostly. Bits of tender young kelp shoots, stylax worms, sea-oranges."

"Chrystal told you all this?" asked Damon incredulously.

"That's right. I explained to him that he and the dekabrach were both our guests, that we planned to treat them exactly alike. If the dekabrach ate well, so would Chrystal. That was all he needed."

Later, Fletcher and Damon stood in the laboratory watching the dekabrach ingest black-green balls of fungus.

"Two days," said Damon sourly, "and what have we accomplished? Nothing."

Fletcher was less pessimistic. "We've made progress in a negative sense. We're pretty sure it has no auditory apparatus, that it doesn't react to sound, and apparently lacks means for making sound. Therefore, we've got to use visual methods to make contact."

"I envy you your optimism," Damon declared. "The beast has given no grounds to suspect either the capacity or the desire for communication."

"Patience," said Fletcher. "It still probably doesn't know what we're trying to do, and probably fears the worst."

"We not only have to teach it a language," grumbled Damon, "we've got to introduce it to the idea that communication is possible. And then invent a language."

Fletcher grinned. "Let's get to work."

"Certainly," said Damon. "But how?"

They inspected the dekabrach, and the black eye-area stared back through the wall of the tank. "We've got to work out a set of visual conventions," said Fletcher. "The ten arms are its most sensitive organs, and presumably are controlled by the most highly organized section of its brain. So—we work out a set of signals based on the dek's arm movements."

"Does that give us enough scope?"

"I should think so. The arms are flexible tubes of muscle. They can assume at least five distinct positions: straight forward, diagonal forward, perpendicular, diagonal back, and straight back. Since the beast has ten arms, evidently there are ten to the fifth power combinations—a hundred thousand."

"Certainly adequate."

"It's our job to work out syntax and vocabulary—a little difficult for an engineer and a biochemist, but we'll have a go at it."

Damon was becoming interested in the project. "It's merely a matter of consistency and sound basic structure. If the dek's got any comprehension whatever, we'll put it across."

"If we don't," said Fletcher, "we're gone geese — and Chrystal winds up taking over the Bio-Minerals raft."

They seated themselves at the laboratory table.

"We have to assume that the deks have no language," said Fletcher.

Damon grumbled uncertainly, and ran his fingers through his hair in annoyed confusion. "Not proven. Frankly, I don't think it's even likely. We can argue back and forth about whether they *could* get along on communal empathy, and such like—but that's a couple of light-years from answering the question whether they *do*.

"They *could* be using telepathy, as we said; they could also be emitting modulated X-rays, establish long-and-short code-signals in some unknown-to-us subspace, hyperspace, or interspace—they *could* be doing almost anything we never heard of.

"As I see it, our best bet—and best hope—is that they *do* have some form of encoding system by which they communicate between themselves. Obviously, as you know, they have to have an internal coding-and-communication system; that's what a neuromuscular structure, with feedback loops, is. Any complex organism has to have communication internally. The whole point of this requirement of language as a means of classifying alien life forms is to distinguish between true communities of individual thinking entities, and the communal insect type of apparent-intelligence.

"Now *if* they've got an ant or bee-like city over there, we're sunk, and Chrystal wins. You can't teach an ant to talk; the nest-group has intelligence, but the individual doesn't.

"So we've got to assume they do have a language—or, to be more general, a formalized encoding system for intercommunication.

"We can also assume it uses a pathway not available to our organisms. That sound sensible to you?"

Fletcher nodded. "Call it a working hypothesis, anyway. We know we haven't seen any indication the dek has tried to signal us."

"Which suggests the creature is not intelligent."

Fletcher ignored the comment. "If we knew more about their habits, emotions, attitudes, we'd have a better framework for this new language."

"It seems placid enough."

The dekabrach moved its arms back and forth idly. The visual-surface studied the two men.

"Well," said Fletcher with a sigh, "first a system of notation." He brought forward a model of the dekabrach's head, which Manners had constructed. The arms were of flexible conduit, and could be bent into various positions. "We number the arms 0 to 9 around the clock, starting with this one here at the top. The five positions—forward, diagonal forward, erect, diagonal back, and back—we call A, B, K, X, Y. K is normal position, and when an arm is at K, it won't be noted."

Damon nodded his agreement. "That's sound enough."

"The logical first step would seem to be numbers."

Together they worked out a system of numeration, and constructed a chart:

The colon (:) indicates a composite signal: i. e. two or more separate signals.

Number	0	1	2	et cetera
Signal	OY	1Y	2Y	et cetera
	10	11	12	et cetera
	OY, 1Y	OY, 1Y: 1Y	OY, 1Y: 2Y	et cetera et cetera
	20	21	22	et cetera
	OY, 2Y	OY, 2Y: 1Y	OY, 2Y: 2Y	et cetera et cetera
	100	101	102	et cetera
	OX, 1Y	OX, 1Y: 1Y	OX, 1Y: 2Y	et cetera et cetera
	110	111	112	et cetera
	OX, 1Y: OY, 1Y	OX, 1Y: OY, 1Y: 1Y	OX, 1Y: OY, 1Y: 2Y	et cetera et cetera et cetera
	120	121	122	et cetera
	OX, 1Y: OY, 2Y	OX, 1Y: OY, 2Y: 1Y	OX, 1Y: OY, 2Y: 2Y	et cetera et cetera et cetera
	200	201	202	et cetera
	OX, 2Y			et cetera
	1000			et cetera
	OB, 1Y			et cetera
	2000			et cetera
	OB, 2Y			et cetera

Damon said, "It's consistent—but possibly cumbersome; for instance, to indicate five thousand seven hundred sixty-six, it's necessary to make the signal . . . let's see: OB, 5Y, then OX, 7Y, then OY, 6Y, then 6Y."

"Don't forget that these are signals, not vocalizations," said Fletcher. "Even so, it's no more cumbersome than 'five thousand, seven hundred and sixty-six.' "

"I suppose you're right."

"Now—words."

Damon leaned back in his chair. "We just can't build a vocabulary and call it a language."

"I wish I knew more linguistic theory," said Fletcher. "Naturally, we won't go into any abstractions."

Our basic English structure might be a good idea," Damon mused, "with English parts of speech. That is, nouns are things, adjectives are attributes of things, verbs are the displacements which things undergo, or the absence of displacement."

Fletcher reflected. "We could simplify even further, to nouns, verbs and verbal modifiers."

"Is that feasible? How, for instance, would you say 'the large raft'?"

"We'd use a verb meaning 'to

grow big'. 'Raft expanded'. Something like that."

"Humph," grumbled Damon. "You don't envisage a very expressive language."

"I don't see why it shouldn't be. Presumably the deks will modify whatever we give them to suit their own needs. If we get across just a basic set of ideas, they'll take it from there. Or by that time someone'll be out here who knows what he's doing."

"O. K.," said Damon, "get on with your Basic Dekabrach."

"First, let's list the ideas a dek would find useful and familiar."

"I'll take the nouns," said Damon. "You take the verbs; you can also have your modifiers." He wrote. "No. 1: water."

After considerable discussion and modification, a sparse list of basic nouns and verbs was agreed upon, and assigned signals.

The simulated dekabrach head was arranged before the tank, with a series of lights on a board nearby, to represent numbers.

"With a coding machine we could simply type out our message," said Damon. "The machine would dictate the impulses to the arms of the model."

Fletcher agreed. "Fine, if we had the equipment and several weeks to tinker around with it. Too bad we don't. Now—let's start. The numbers first. You work the lights, I'll move the arms. Just one to nine for now."

Several hours passed. The dekabrach floated quietly, the black eyespot observing.

Feeding time approached. Damon displayed the black-green fungus balls; Fletcher arranged the signal for "food" on the arms of the model. A few morsels were dropped into the tank.

The dekabrach quietly sucked them into its oral tube.

Damon went through the pantomime of offering food to the model. Fletcher moved the arms to the signal "food." Damon ostentatiously placed the fungus ball in the model's oral tube, then faced the tank, and offered food to the dekabrach.

The dekabrach watched impassively.

Two weeks passed. Fletcher went up to Raight's old room to talk to Chrystal, whom he found reading a book from the micro-film library.

Chrystal extinguished the image of the book, swung his legs over the side of the bed, sat up.

Fletcher said, "In a very few days the inspector is due."

"So?"

"It's occurred to me that you might have made an honest mistake. At least I can see the possibility."

"Thanks," said Chrystal, "for nothing."

"I don't want to victimize you on what may be an honest mistake."

"Thanks again—but what do you want?"

"If you'll coöperate with me in having dekabrachs recognized as an

intelligent life form, I won't press charges against you."

Chrystal raised his eyebrows. "That's big of you. And I'm supposed to keep my complaints to myself?"

"If the deks are intelligent, you don't have any complaints."

Chrystal looked keenly at Fletcher. "You don't sound too happy. The dek won't talk, eh?" Chrystal laughed at his joke.

Fletcher restrained his annoyance. "We're working on him."

"But you're beginning to suspect he's not so intelligent as you thought."

Fletcher turned to go. "This one only knows fourteen signals so far. But it's learning two or three a day."

"Hey!" called Chrystal. "Wait a minute!"

Fletcher stopped at the door. "What for?"

"I don't believe you."

"That's your privilege."

"Let me see this dek make signals."

Fletcher shook his head. "You're better off in here."

Chrystal glared. "Isn't that a rather unreasonable attitude?"

"I hope not." He looked around the room. "Anything you're lacking?"

"No." Chrystal turned the switch, and his book flashed once more on the ceiling.

Fletcher left the room; the door closed behind him; the bolts shot home. Chrystal sat up alertly, jumped to his feet with a peculiar lightness, went to the door, listened.

Fletcher's footfalls diminished down the corridor. Chrystal returned to the bed in two strides, reached under the pillow, brought out a length of electric cord, detached from a desk lamp. He had adapted two pencils as electrodes, notching through the wood to the lead, binding a wire around the graphite core so exposed. For resistance in the circuit he included a lamp bulb.

He then went to the window. He could see the deck all the way down to the eastern edge of the raft, as well as behind the office to the storage bins at the back of the process house.

The deck was empty. The only movement was a white wisp of steam rising from the circulation flue, and the hurrying pink and scarlet clouds behind.

Chrystal went to work, whistling soundlessly between intently pursed lips. He plugged the cord into the baseboard strip, held the two pencils to the window, struck an arc, burnt at the groove which now ran nearly halfway around the window — the only means by which he could cut through the tempered beryl-silica glass.

It was slow work and very delicate. The arc was weak and fractious, fumes grated in Chrystal's throat. He persevered, blinking through watery eyes, twisting his head this way and that, until five-thirty, half an hour before his evening meal, when he put the equipment away. He dared not work after dark, for fear the

flicker of light would arouse suspicion.

The days passed. Each morning Geidion and Atreus brought their respective flushes of scarlet and pale green to the dull sky; each evening they vanished in sad dark sunsets behind the western ocean.

A makeshift antenna had been jury-rigged from the top of the laboratory to a pole over the living quarters. Early one afternoon Manners blew the general alarm in short jubilant blasts to announce a signal from the LG-19, putting into Sabria on its regular six-months call. Tomorrow evening lighters would swing down from orbit, bringing the sector inspector, supplies, and new crews for both Bio-Minerals and Pelagic Recoveries.

Bottles were broken out in the mess hall; there was loud talk, brave plans, laughter.

Exactly on schedule the lighters—four of them—burst through the clouds. Two settled into the ocean beside Bio-Minerals, two more dropped down to the Pelagic Recoveries raft.

Lines were carried out by the launch, the lighters were warped against the dock.

First aboard the raft was Inspector Bevington, a brisk little man, immaculate in his dark-blue and white uniform. He represented the government, interpreted its multiplicity of rules, laws and ordinances; he was empowered to adjudicate minor offences, take custody of criminals, investigate violations of galactic law, check living conditions and safety

practices, collect imposts, bonds and duties, and, in general, personify the government in all of its faces and phases.

The job might well have invited graft and petty tyranny, were not the inspectors themselves subject to minute inspection.

Bevington was considered the most conscientious and the most humorless man in the service. If he was not particularly liked, he was at least respected.

Fletcher met him at the edge of the raft. Bevington glanced at him sharply, wondering why Fletcher was grinning so broadly. Fletcher was thinking that now would be a dramatic moment for one of the dekabrach's monitors to reach up out of the sea and clutch Bevington's ankle. But there was no disturbance; Bevington leaped to the raft without interference.

He shook hands with Fletcher, seeking up and down the dock. "Where's Mr. Raight?"

Fletcher was taken aback; he had become accustomed to Raight's absence. "Why—he's dead."

It was Bevington's turn to be startled. "Dead?"

"Come along to the office," said Fletcher, "and I'll tell you about it. This last has been a wild month." He looked up to the window of Raight's old room where he expected to see Chrystal looking down. But the window was empty. Fletcher halted. Empty indeed! The window was vacant even of glass! He started down the deck.

"Here!" cried Bevington. "Where are you going?"

Fletcher paused long enough to call over his shoulder, "You'd better come with me!" then ran to the door leading into the mess hall. Bevington came after him, frowning in annoyance and surprise.

Fletcher looked into the mess hall, hesitated, came back out on deck, looked up at the vacant window. Where was Chrystal? As he had not come along the deck at the front of the raft, he must have headed for the process house.

"This way," said Fletcher.

"Just a minute!" protested Bevington. "I want to know just what and where—"

But Fletcher was on his way down the eastern side of the raft toward the process house, where the lighter crew was already looking over the cases of precious metal to be transshipped. They glanced up when Fletcher and Bevington came running up.

"Did anybody just come past?" asked Fletcher. "A big blond fellow?"

"He went in there." The lightermen pointed toward the process house.

Fletcher whirled, ran through the doorway. Beside the leaching columns he found Hans Heinz, looking ruffled and angry.

"Chrystal come through here?" Fletcher panted.

"Did he come through here! Like a hurricane. He gave me a push in the face."

"Where did he go?"

Heinz pointed. "Out on the front deck."

Fletcher and Bevington ran off, Bevington demanding petulantly, "Exactly what's going on here?"

"I'll explain in a minute," yelled Fletcher. He ran out on deck, looked toward the barges and launch.

No Ted Chrystal.

He could only have gone in one direction: back toward the living quarters, having led Fletcher and Bevington in a complete circle.

A sudden thought hit Fletcher. "The helicopter!"

But the helicopter stood undisturbed, with its guy-lines taut. Murphy came toward them, looking perplexedly over his shoulder.

"Seen Chrystal?" asked Fletcher.

Murphy pointed. "He just went up them steps."

"The laboratory!" cried Fletcher in sudden agony. Heart in his mouth he pounded up the steps, Murphy and Bevington at his heels. If only Damon were in the laboratory, not down on the dock or in the mess hall.

The lab was empty—except for the tank with the dekabrach.

The water was cloudy, bluish. The dekabrach was thrashing from end to end of the tank, the ten arms kinked and knotted.

Fletcher jumped on a table, vaulted directly into the tank. He wrapped his arms around the writhing body, lifted. The supple shape squirmed out of his grasp. Fletcher grabbed again, heaved in desperation, raised it out of the tank.

"Grab hold," he hissed to Murphy between clenched teeth. "Lay it on the table."

Damon came rushing in. "What's going on?"

"Poison," said Fletcher. "Give Murphy a hand."

Damon and Murphy managed to lay the dekabrach on the table. Fletcher barked, "Stand back, flood coming!" He slid the clamps from the side of the tank, the flexible plastic collapsed; a thousand gallons of water gushed across the floor.

Fletcher's skin was beginning to burn. "Acid! Damon, get a bucket, wash off the dek. Keep him wet."

The circulatory system was still pumping brine into the tank. Fletcher tore off his trousers, which held the acid against his skin, gave himself a quick rinse, turned the brine-pipe around the tank, flushing off the acid.

The dekabrach lay limp, its propulsion vanes twitching. Fletcher felt sick and dull. "Try sodium carbonate," he told Damon. "Maybe we can neutralize some of the acid." On sudden thought he turned to Murphy, "Go get Chrystal. Don't let him get away."

This was the moment that Chrystal chose to stroll into the laboratory. He looked around the room in mild surprise, hopped up on a chair to avoid the water.

"What's going on in here?"

Fletcher said grimly, "You'll find out." To Murphy: "Don't let him get away."

"Murderer!" cried Damon in a voice that broke with strain and grief.

Chrystal raised his eyebrows in shock. "Murderer?"

Bevington looked back and forth between Fletcher, Chrystal and Damon. "Murderer? What's all this?"

"Just what the law specifies," said Fletcher. "Knowingly and willfully destroying one of an intelligent species. Murder."

The tank was rinsed; he clamped up the sides. The fresh brine began to rise up the sides.

"Now," said Fletcher. "Hoist the dek back in."

Damon shook his head hopelessly. "He's done for. He's not moving."

"We'll put him back in anyway," said Fletcher.

"I'd like to put Chrystal in there with him," Damon said with passionate bitterness.

"Come now," Bevington reproved him, "let's have no more talk like that. I don't know what's going on, but I don't like anything of what I hear."

Chrystal, looking amused and aloof, said, "I don't know what's going on either."

They lifted the dekabrach, lowered him into the tank.

The water was about six inches deep, rising too slowly to suit Fletcher.

"Oxygen," he called. Damon ran to the locker. Fletcher looked at Chrystal. "So you don't know what I'm talking about?"

"Your pet fish dies; don't try to pin it on me."

Damon handed Fletcher a breather-tube from the oxygen tank; Fletcher thrust it into the water beside the dekabrach's gills. Oxygen bubbled up; Fletcher agitated the water, urged it into the gill openings. The water was nine inches deep. "Sodium carbonate," Fletcher said over his shoulder. "Enough to neutralize what's left of the acid."

Bevington asked in an uncertain voice, "Is it going to live?"

"I don't know."

Bevington squinted sidewise at Chrystal, who shook his head. "Don't blame me."

The water rose. The dekabrach's arms lay limp, floating in all directions like Medusa locks.

Fletcher rubbed the sweat off his forehead. "If only I knew what to do! I can't give it a shot of brandy; I'd probably poison it."

The arms began to stiffen, extend. "Ah," breathed Fletcher, "that's better." He beckoned to Damon. "Gene, take over here—keep the oxygen going into the gills." He jumped to the floor where Murphy was flushing the floor with buckets of water.

Chrystal was talking with great earnestness to Bevington. "I've gone in fear of my life these last three weeks! Fletcher is an absolute madman; you'd better send up for a doctor—or a psychiatrist." He caught Fletcher's eye, paused. Fletcher came slowly across the room. Chrystal returned to the inspector, whose expression was harassed and uneasy.

"I'm registering an official complaint," said Chrystal. "Against Bio-Minerals in general and Sam Fletcher

in particular. As a representative of the law, I insist that you place Fletcher under arrest for criminal offenses against my person."

"Well," said Bevington, cautiously glancing at Fletcher, "I'll certainly make an investigation."

"He kidnaped me at the point of a gun," cried Chrystal. "He's kept me locked up for three weeks!"

"To keep you from murdering the dekabrachs," said Fletcher.

"That's the second time you've said that," Chrystal remarked ominously. "Bevington is a witness. You're liable for slander."

"Truth isn't slander."

"I've netted dekabrachs, so what? I also cut kelp and net coelocanths. You do the same."

"The deks are intelligent. That makes a difference." Fletcher turned to Bevington. "He knows it as well as I do. He'd process men for the calcium in their bones if he could make money at it!"

"You're a liar!" cried Chrystal.

Bevington held up his hands. "Let's have order here! I can't get to the bottom of this unless someone presents facts."

"He doesn't have facts," Chrystal insisted. "He's trying to run my raft off of Sabria—can't stand the competition!"

Fletcher ignored him. He said to Bevington, "You want facts. That's why the dekabrach is in that tank, and that's why Chrystal poured acid in on him."

"Let's get something straight," said Bevington, giving Chrystal a hard stare. "Did you pour acid into that tank?"

Chrystal folded his arms. "The question is completely ridiculous."

"Did you? No evasions now."

Chrystal hesitated, then said firmly, "No. And there's no vestige of proof that I did so."

Bevington nodded. "I see." He turned to Fletcher. "You spoke of facts. What facts?"

Fletcher went to the tank, where Damon still was swirling oxygenated water into the gills. "How's he coming?"

Damon shook his head dubiously. "He's acting peculiar. I wonder if the acid got him internally?"

Fletcher watched the long pale shape for a half minute. "Well, let's try him. That's all we can do."

He crossed the room, wheeled the model dekabrach forward. Chrystal laughed, turned away in disgust. "What do you plan to demonstrate?" asked Bevington.

"I'm going to show you that the dekabrach is intelligent and is able to communicate."

"Well, well," said Bevington. "This is something new, is it not?"

"Correct." Fletcher arranged his notebook.

"How did you learn his language?"

"It isn't his—it's a code we worked out between us."

Bevington inspected the model, looked down at the notebook. "These are the signals?"

Fletcher explained the system.

"He's got a vocabulary of fifty-eight words, not counting numbers up to nine."

"I see." Bevington took a seat. "Go ahead. It's your show."

Chrystal turned. "I don't have to watch this fakery."

Bevington said, "You'd better stay here and protect your interests; if you don't, no one else will."

Fletcher moved the arms of the model. "This is admittedly a crude setup; with time and money we'll work out something better. Now, I'll start with numbers."

Chrystal said contemptuously, "I could train a rabbit to count that way."

"After a minute," said Fletcher, "I'll try something harder. I'll ask who poisoned him."

"Just a minute!" bawled Chrystal. "You can't tie me up that way!"

Bevington reached for the notebook. "How will you ask? What signals do you use?"

Fletcher pointed them out. "First, interrogation. The idea of interrogation is an abstraction which the dek still doesn't completely understand. We've established a convention of choice, or alternation, like, 'which do you want?' Maybe he'll catch on what I'm after."

"Very well—'interrogation.' Then what?"

"Dekabrach—receive—hot—water. ('Hot water' is for acid.) Interrogation: Man—give—hot—water?"

Bevington nodded. "That's fair enough. Go ahead."

Fletcher worked the signals. The black eye-area watched. Damon said anxiously, "He's restless—very uneasy."

Fletcher completed the signals. The dekabrach's arms waved once or twice, gave a puzzled jerk.

Fletcher repeated the set of signals, added an extra "interrogation — man?"

The arms moved slowly. " 'Man'," read Fletcher. Bevington nodded. "Man. But which man?"

Fletcher said to Murphy, "Stand in front of the tank." And he signaled, "Man — give—hot — water—interrogation."

The dekabrach's arms moved. " 'Null-zero'," read Fletcher. "No. Damon—step in front of the tank." He signaled the dekabrach. "Man—give—hot—water—interrogation."

" 'Null'."

Fletcher turned to Bevington. "You stand in front of the tank." He signaled.

" 'Null'."

Everyone looked at Chrystal. "Your turn," said Fletcher. "Step forward, Chrystal."

Chrystal came slowly forward, "I'm not a chump, Fletcher. I can see through your gimmick."

The dekabrach was moving its arms. Fletcher read the signals, Bevington looking over his shoulder at the notebook.

" 'Man—give—hot—water.' "

Chrystal started to protest. Bevington quieted him. "Stand in front of the tank, Chrystal." To Fletcher: "Ask once again."

Fletcher signaled. The dekabrach

responded. " 'Man—give—hot—water. Yellow. Man. Sharp. Come. Give—hot—water. Go.' "

There was silence in the laboratory.

"Well," said Bevington flatly, "I think you've made your case, Fletcher."

"You're not going to get me that easy," said Chrystal.

"Quiet," rasped Bevington. "It's clear enough what's happened—"

"It's clear what's going to happen," said Chrystal in a voice husky with rage. He was holding Fletcher's gun. "I secured this before I came up here—and it looks as if—" he raised the gun toward the tank, squinted, his big white hand tightened on the trigger. Fletcher's heart went dead and cold.

"Hey!" shouted Murphy.

Chrystal jerked. Murphy threw his bucket; Chrystal fired at Murphy, missed. Damon jumped at him, Chrystal swung the gun. The white-hot jet pierced Damon's shoulder. Damon, screaming like a hurt horse, wrapped his bony arms around Chrystal. Fletcher and Murphy closed in, wrested away the gun, locked Chrystal's arms behind him.

Bevington said grimly, "You're in trouble now, Chrystal, even if you weren't before."

Fletcher said, "He's killed hundreds and hundreds of the deks. Indirectly he killed Carl Raight and John Agostino. He's got a lot to answer for."

The replacement crew had moved down to the raft from the LG-19. Fletcher, Damon, Murphy and the rest of the old crew sat in the mess hall, with six months of leisure ahead of them.

Damon's left arm hung in a sling; with his right he fiddled with his coffee cup. "I don't quite know what I'll be doing. I have no plans. The fact is, I'm rather up in the air."

Fletcher went to the window, looked out across the dark scarlet ocean. "I'm staying on."

"What?" cried Murphy. "Did I hear you right?"

Fletcher came back to the table. "I can't understand it myself."

Murphy shook his head in total lack of comprehension. "You can't be serious."

"I'm an engineer, a working man," said Fletcher. "I don't have a lust for power, or any desire to change the universe—but it seems as if Damon and I set something into motion—something important—and I want to see it through."

"You mean, teaching the deks to communicate?"

"That's right. Chrystal attacked them, forced them to protect themselves. He revolutionized their lives. Damon and I revolutionized the life of this one dek in an entirely new way. But we've just started. Think of the potentialities! Imagine a population of men in a fertile land—men like ourselves except that they never learned to talk. Then someone gives them contact with a new universe—an intellectual stimulus like nothing they'd ever experienced. Think of

their reactions, their new attack on life! The deks are in that same position—except that we've just started with them. It's anybody's guess what they'll achieve — and somehow, I want to be part of it. Even if I didn't, I couldn't leave with the job half-done."

Damon said suddenly, "I think I'll stay on, too."

"You two have gone stir-crazy," said Jones. "I can't get away fast enough."

The LG-19 had been gone three weeks; operations had become routine aboard the raft. Shift followed shift; the bins began to fill with new ingots, new blocks of precious metal.

Fletcher and Damon had worked long hours with the dekabrach; today would see the great experiment.

The tank was hoisted to the edge of the dock.

Fletcher signaled once again his final message. "Man show you signals. You bring many dekabrachs, man show signals. Interrogation."

The arms moved in assent. Fletcher backed away; the tank was hoisted, lowered over the side, submerged.

The dekabrach floated up, drifted a moment near the surface, slid down into the dark water.

"There goes Prometheus," said Damon, "bearing the gift of the gods."

"Better call it the gift of gab," said Fletcher grinning.

The pale shape had vanished from sight. "Ten gets you fifty he won't be back," Caldur, the new superintendent, offered them.

"I'm not betting," said Fletcher, "just hoping."

"What will you do if he doesn't come back?"

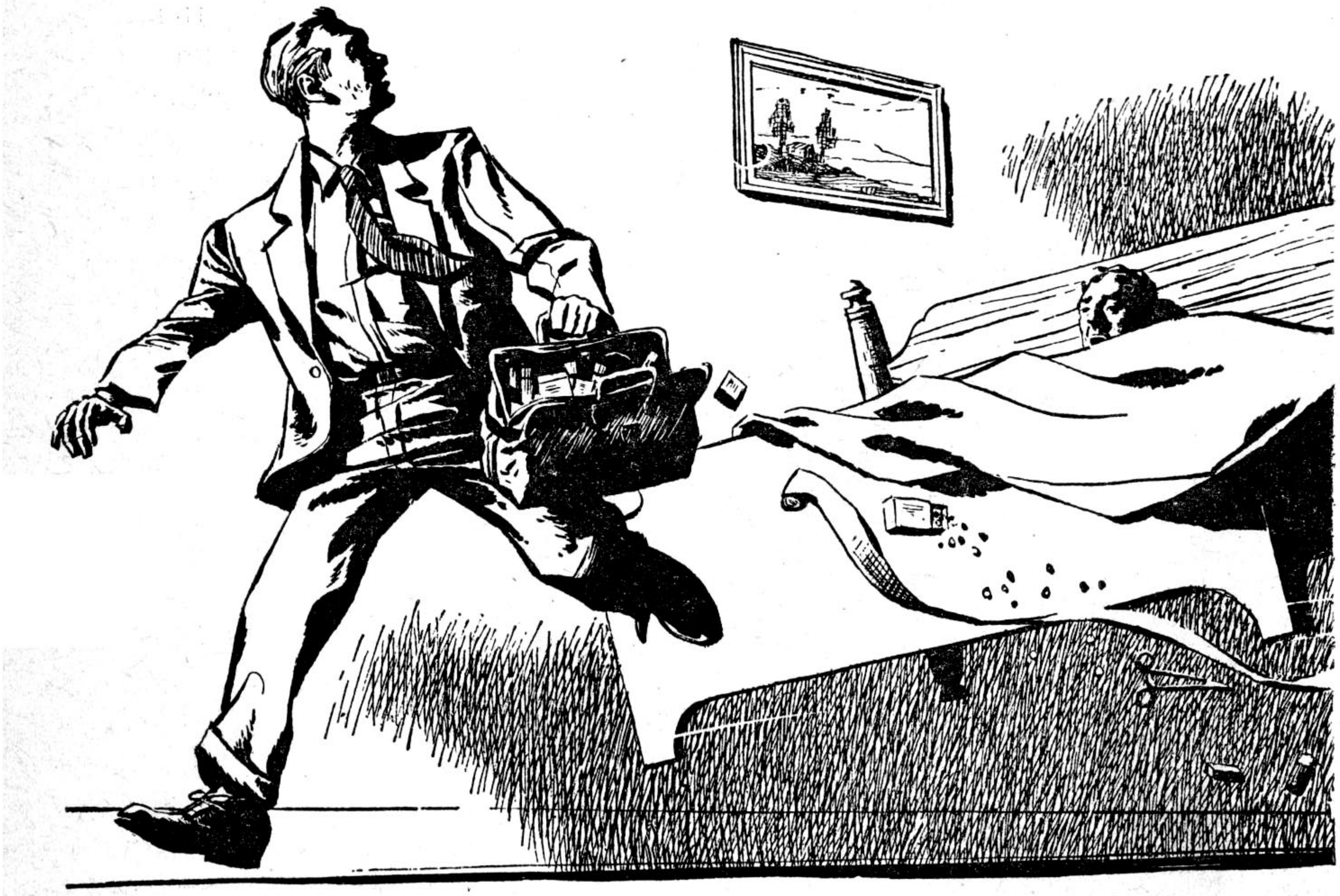
Fletcher shrugged. "Perhaps net another, teach him. After a while it's bound to take hold."

Three hours went by. Mists began to close in; rains blurred the sky.

Damon, peering over the side, looked up. "I see a dek. But is it our dek?"

A dekabrach came to the surface. It moved its arms. "Many—dekabrachs. Show—signals."

"Professor Damon," said Fletcher, "your first class."



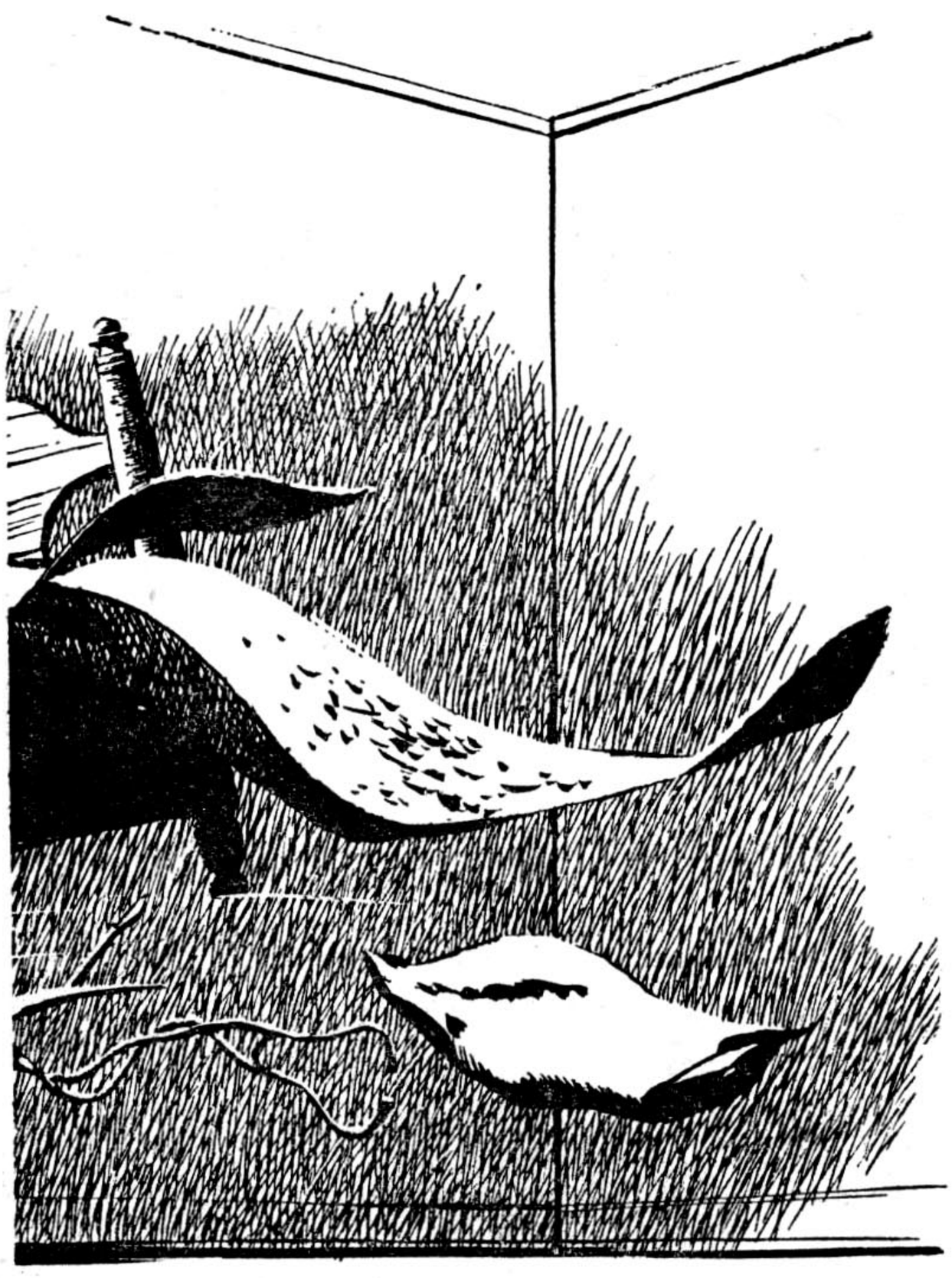
ASPIRIN WON'T HELP IT

BY JOHN A. SENTRY

It started like a cold . . . but it was a much more dangerous disease. More dangerous to the doctor, that is . . .

Illustrated by van Dongen

Working behind a sandwich counter is like nothing else in the world. It's one of those jobs where you run like mad for an hour at a time, and, in between, you sit around and think you'll go nuts if you don't see another human face pretty soon. I figured out once that the best kind of counterman would be something like a werewolf; he'd be an octopus on



roller skates during rush hours and a Martian intelligent vegetable the rest of the time.

But that's not what happened to me. What happened to me was like this:

It was a day about six months ago, with the weather pretty cold and dreary. Most of my customers had sniffles of one kind or another, and Doc, over in the drug half of the store, was doing a good business in all kinds of anti-cold gunk.

Now, half of a counterman's income comes from tips. So, even if you don't get your pay docked for being sick, you drag yourself in to work if you can possibly make it. But, 'round about right after coffee-break time, I had to admit I was really down with something. My ears were popping, my eyes were watery, my face felt hot, and my throat felt pretty sore. I finished washing up the last of the coffee-break crockery and leaned against the counter, looking across the store at the display cards tacked up all over Doc's counters. There must have been nearly a hundred brands of guaranteed cold cures.

Like most people, I guess I've tried just about everything, at one time or another. I used to depend on hot tea with lots of lemon. I found out lemon juice is an acid, which does your throat no good, so I switched to honey. I found out honey just provides a nice sugar base for bacteria to multiply in, so I switched to strong tea, plain—figuring on tannic acid, you know—but that didn't do any good, either. Then I ran through the drugstore gamut. I've had my kidneys jolted, my histamine suppressed, my heartbeat accelerated, and my ears jangled with quinine. I've had my stomach acids neutralized, my alkalis washed out, and, once, I've gotten serious burns under a sunlamp. I've gotten roaring drunk.

But, somehow, every time it hits you, you try again. So I went over to Doc, picked up a couple of packages of tissues for when my nose started to run, and sighed as well as I could with my respiratory system as clogged as it was.

"What's good this week, Doc?" I asked.

Doc looked at me hopelessly, made sure there weren't any customers around to hear him, and pointed at the tissues.

"I'm afraid you've already got it, Charley," he said. "Two dozen hankies is about the best. That and a few days in bed. Plenty of liquids, and several good books."

I nodded. "Pretty much what I was afraid of," I said. "You sure there isn't anything else?"

"Well, there are various kinds of alleviants which will cut down your misery. But no cures. Besides, it looks to me that what you've got is one of these virus things. Catch them early enough, and you're all right. But I'm afraid it's a little too late for that, in your case. You're due for twenty-four hours of moderately high fever. I'd advise you to go home and go to bed."

I didn't like that idea at all. So I thanked him for his advice and went back to work.

Which was a mistake.

Noon rush was a nightmare. It felt like I was walking through glue, and my eyes didn't seem to be focused right. I'd reach for white and bring up rye, I poured coffee all over my hand instead of into cups, and I swear I dropped a dozen glasses of water, thinking I had them down on the counter and missing by inches. Luckily, they fell over towards the inside, instead of at the customers.

It was one of those days, too, when lots of little things go wrong at once. The duckboards kept slithering around underfoot, and the refrigerator door kept popping open, and the knife was never where I left it.

By the time that was over, I had one steady customer less and no really satisfied ones. I had maybe a buck in tips, as against my usual three or four, and there were grease burns and cuts all over me, to say nothing of the scalds and the big splotches of spilled stuff all over my apron. I was running perspiration, and my voice sounded weird.

I'm stubborn, but not suicidal. I made a pass at cleaning up after the rush, decided even that wasn't worth it, and called the union for a replacement. The minute he came in the door, I had my apron off, and five minutes later I was on my way home, huddled up in a corner seat on the subway, counting stops, wishing miserably that I was already home. As a matter of fact, I did make it in what seemed like an unusual hurry, even for an off-hour train, but I wasn't in much of a mood for excessive gratitude. I just figured Lady Luck was making it up to me, and let it go at that.

I dragged myself up the stairs, opened the apartment door, and headed straight for the bedroom. Arlene looked up from the TV, saw the shape I was in, and headed for the kitchen to squeeze oranges and make tea. I sort of raised one hand and said "H'lo," but that was the best I was up to in the way of conversation.

I got inside the bedroom on willpower alone. The spots in front of my eyes were clotting together in big clouds, and every time I moved my head, it felt like I was falling.

I had it. Oh, I had it, and I was pretty darned grateful when I felt those crisp sheets all around me and a good soft pillow under my head. I pulled the blankets up around my neck and just lay there with my eyes closed, breathing.

When Arlene came into the room, carrying a tray, she made a surprised sound.

"Gee!" she said, "you got that bed made in a hurry. I didn't even see you going in the linen closet."

"Huh?"

"Well, today's laundry day. I stripped the bed, and I didn't make it yet. Don't you remember?"

I shook my head. Not that it made any difference. I'd been moving in a fog all afternoon—if she told me I'd come home following a blue giraffe, it wouldn't have surprised me.

"Hm-m-m. Well," she said, setting the tray down and looking a little worried, "maybe I'd better call Dr. Marten."

And what was he going to do for me? I shook my head again. "No sense to that," I croaked. "I'll be all right tomorrow."

She felt my head. "I wouldn't be so sure. You're running a fever."

This was not news to me. My arms and legs felt they were floating a quarter-inch off the bed.

She felt my head again. "You're pretty sick. It won't hurt to have the doctor come in and look at you."

Well, maybe . . . At least, he might be able to knock the fever down. So I said all right, and Arlene bent over to kiss me on the forehead before she went out to the phone.

I came up to meet her.

This is tricky, and I'd better be specific. I didn't push myself up, or bend forward, or raise my head. I just sort of . . . rose. That is, her lips touched my forehead sooner than they should have.

She jumped a little, but she didn't really notice anything. For one thing, she had her eyes closed.

As for me, all this just proved how delirious I was. After all, I hadn't moved, and I didn't notice myself moving. It's just that, without anything in particular being done by me or to me, my head was three inches higher above the pillow than it had been.

So I just took advantage of things to kiss the tip of her nose, too, and then I was back down on the pillow. Like I've said, Arlene didn't seem to notice anything, either, but she stopped just inside the door and gave me a very puzzled look just before she went out to call the doctor.

The doctor couldn't make it for another hour or so, and Arlene had to go out and do the marketing, so I was all alone for a while. I lay in bed, not thinking of anything in particular. I wondered about how soon it would be before I could get back to work, and whether I could pos-

sibly get the Workingmen's Compensation Board to see this my way, but nothing important happened.

Except that, just before the doctor came in, I remembered drinking the tea and orange juice—yeah, I know that's an acid, too, but Arlene believes in it—and, when I looked, the cup and the glass were empty, but I didn't remember reaching over to pick either of them up.

So, Dr. Marten took my temperature and pulse, thumped my chest, looked down my throat and in my ears, and shrugged.

"Some kind of virus, Charley," he said. "Looks like one of those twenty-four-hour jobs. Lots of liquids, plenty of bed rest, and I can promise you a fairly miserable night. You'll probably come out of it sometime tomorrow night, be weak as a kitten the day after, and feel fine the day after that. Hold out your arm."

He had a hypodermic full of some kind of antibiotic, and he swabbed my arm with a hunk of cotton soaked in alcohol.

Now, understand me, I'm no sissy. I was night counterman in a little one-man hamburger tower near St. Nicholas Park for a year and a half, and before that I worked down near the docks, in one of the loncliest diners in Manhattan. I've been in a fight or two, and there isn't a counterman alive that hasn't cut and burned himself pretty badly, at one time or another, and known it was going to happen again.

But I don't like hypodermics. I darned near fainted when Arlene and I went down for our blood test before we got married.

I did not want that needle in me.

Never ask me what happened, because I don't exactly know. All of a sudden, it seemed like my fever was worse—much worse—a *lot* worse. I grayed out completely. I wasn't unconscious, but I couldn't seem to get my eyes working at all, and I was thrashing pretty badly on the bed.

I heard glass break, and Doc Marten cursed a blue streak that ended in a kind of frightened yelp. That was when I heard what sounded like something tearing. My bed began to roll, and there was a sound like running feet. The doctor, I guess. Then I heard plaster fall, a door slam, and my bed rammed up against something.

My eyes cleared.

The room looked like a war had been fought in it. Plaster *had* fallen, in patches off the ceiling in a trail that led from beside where my bed had been to the door. The doctor's bag was upside down in a corner, at the end of another trail of vials, bottles, pillboxes, a stethoscope, a couple of hypodermics, and miscellaneous impedimenta. The orange juice glass and the teacup had apparently been flung at the wall—right past the doctor's head, I'd say, if he'd been running for the door just ahead of that cascade of plaster, and the tray was on the floor right beside the door. As far as I could tell, he'd made it outside before it hit.

But the most interesting part was my bed, which was up against the

door and holding fast, in spite of its casters, against the doctor's thumping from the other side.

I felt awful weak.

Dr. Marten was banging on the door pretty hard. I was starting to climb out and pull the bed back when I heard Arlene's voice. It sounded pretty frightened, and pretty worried, too.

"Charley? Charley, what happened? Are you all right?"

I couldn't really answer either half of that. "I'm all right, I guess," I said back to her.

"Please let me in, Charley."

I started to tell her I was trying, but just then the bed began to roll all by itself. I yelled and got my legs aboard, and we rolled back to where the bed belonged, and stopped. I sat there, not too sure whether I dared to try getting out of it, with the blankets up around my shoulders, wondering what the devil *had* happened.

The door opened cautiously, and Arlene stuck her head in the room. She looked around and gasped at the shape it was in, but she was mostly worried about me.

"Charley! What did you do to Dr. Marten?" She came across the room and started to get too close to the bed. I didn't think that was such a good idea, but, on the other hand, what could I say? So I just waved her back, and I guess I looked pretty mysterious about it.

"Charley? What is it, dear?"

I shook my head and put my finger up to my lips. The thought had occurred to me that the bed might do something if I talked about it.

"Charley?" Arlene wasn't trying to get near me any more. She was backing away a little. I could see Dr. Marten standing uncertainly in the doorway behind her, looking at me with his head cocked. His jacket was rumpled, and his tie was off at an angle. His shirt was gone.

The bed seemed to make a threatening motion toward him, and he stepped back quickly. Arlene jumped.

I huddled on the bed, feeling miserable. I could see Arlene was pretty scared, and it had to be my fault. I didn't know how—I hadn't *done* anything—but that was the way it figured.

"I'm . . . look, honey, I'm sorry," I said. "Don't be scared."

She was looking at the bed with a very peculiar expression on her face.

"You didn't do that," she said.

"Do what?"

"Make the bed move. I was watching you. You didn't jump or anything. Wait a minute."

She got on her hands and knees across the room and looked under the bed. "Pull the covers up," she said. "They're in the way."

I tugged at them, and they pulled clear. Arlene grunted and stood up. "No motor." She looked at me thoughtfully.

I didn't quite get it.

Dr. Marten was back in the doorway. "Mrs. Holloway, I think it might be best if you came back

here," he said, looking at me significantly.

Arlene shook her head impatiently.

"Mrs. Holloway, I'm afraid I've got to insist."

She waved a hand at him and muttered, "Sure, doctor, sure."

"Honey," I said hesitantly, "you mad at me?"

She shook her head. "I wonder what kind of bug you caught," she muttered.

"Mrs. Holloway! I appreciate the fact that you love your husband, but he's potentially dangerous. Any man in sufficient delirium to hurl glasses and . . . and other things . . . at another individual, and then attempt to run him down with a bed . . . tear his shirt off—" he finished up with a mutter.

I did all that?

Marten looked like he was getting mad. Arlene looked at me. "You stay in bed, Charley," she said. "I'll be in to see you after a while. I want to talk to the doctor."

"All right, honey," I said, feeling kind of low. But the bed seemed to have settled down, and I *was* pretty sick.

I remember, in between going off to sleep because of the fever, Dr. Marten's voice coming pretty loud through the closed door.

"Mrs. Holloway, what you're suggesting is ridiculous! I'll admit there are many types of unclassified virus, but a parapsychogenetive infection is absolute nonsense!"

Arlene said something back—I couldn't catch it, because she was using her low voice, but it's her low voice that's the grim and practical one.

A couple of times, Marten mentioned Bellevue, but he didn't mention it much.

Though I do seem to remember the room going wild again when a couple of strange men in white coats tried to get to me.

I don't know, for sure. The fever kept getting worse, and I kept going to sleep or passing out. I kept waking up, all through the night, sometimes because Arlene was sitting on the bed and stroking my forehead, but mostly because there was so much noise out in the street and all through the neighborhood. I kept tossing and turning, and outside there'd be noises like high winds.

I'm certain I heard glass break lots of times, and I knew Dr. Marten tried to get in the room once to pick up his bag and stuff, because they chased him out through the apartment, down the hall and down the stairs, and all the way out into the street. At least, I *think* I recognized the voice yelling for help, down in the street.

When I woke up, the fever was gone. The bed was soaked with perspiration, and I felt limp, as though something had cut my tendons. But that was just weakness, because, by mid-afternoon, I could walk around a little. I looked out the

window, and all the television antennas were down.

The neighborhood looked good, too—as if every speck of dirt that had been accumulating for a hundred years had disappeared. The streets were clean, and the air was crystal clear. Down on the corner, the pool hall that I knew was just a front for a lot of other things was being boarded up. It looked like a bulldozer had gone through it.

I looked at Arlene, who was cleaning up the room, and she looked at me. "You're going to have to let Dr. Marten examine you," she said. "Just to prove you're O. K."

"Uh-huh." I knew what she meant by that, too. All the traces of the delirium would have to be gone.

"Charley—"

"Yeah, honey?"

"I'd like to move the piano. Sort of change the living room around a little. I'm tired of the way it is."

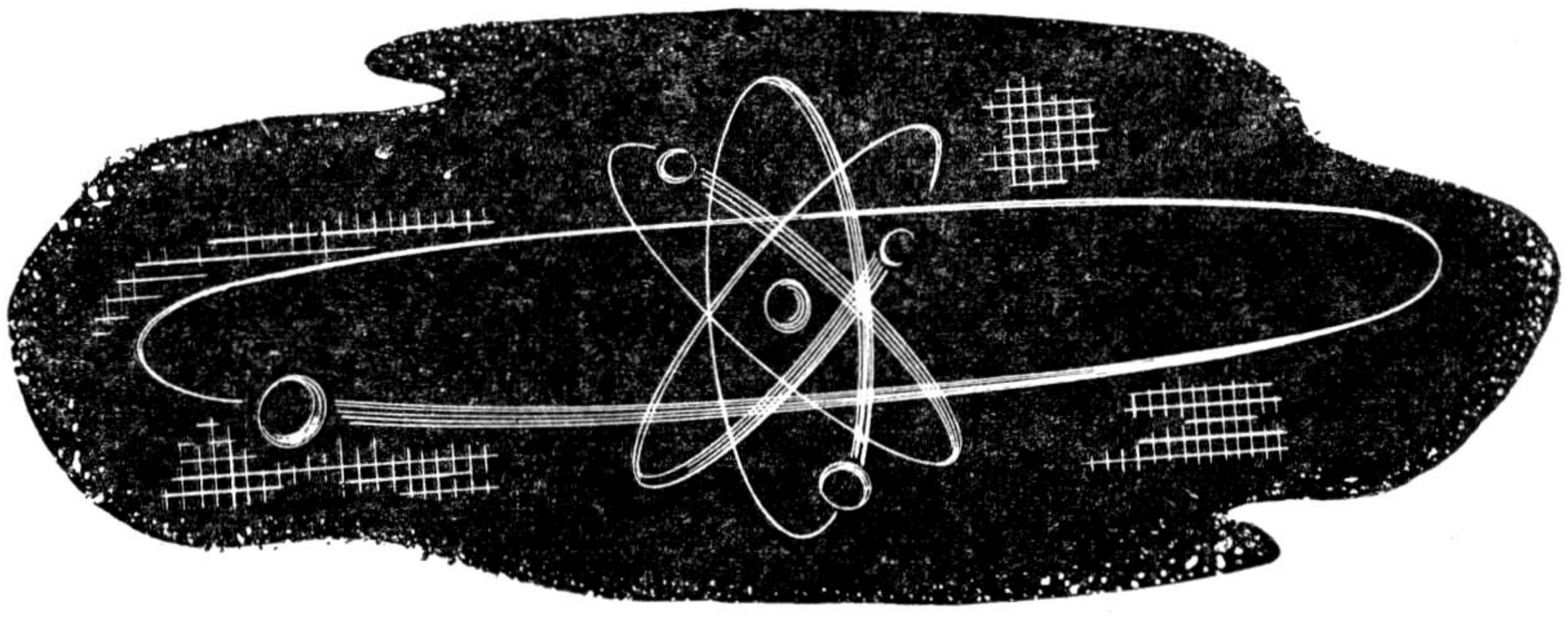
Damn! I *hate* moving furniture. Say "piano" to me, and I duck instinctively.

Then I realized what she was doing, and I looked out in the living room.

I don't use it. I've got it, but I don't think Dr. Marten would describe it as anything but a chronic, systematic delusion. If he had to, he'd in all probability fall back on "mass hypnosis."

So I don't use it, except around the house to help Arlene, and maybe keep the neighborhood touched up a bit. It's no good to me at all, when I'm working, because I've got anywhere from one to twenty people sitting in a row, watching me. About the best I can do is, during a really bad rush, when everybody's yelling for service and everybody's intent on their own order, I can, if I'm careful, let the toast butter itself.

THE END



CALL HIM DEAD

BY ERIC FRANK RUSSELL

Part Two of Three Parts. ***Until you can define what's meant by "I," or "this man"—it's a little tough deciding when a man has been murdered. When his body falls and fails to move again . . . or before that?***

Illustrated by Freas

SYNOPSIS

It is the year 1980. *There are a few moving roadways in Los Angeles, Chicago and New York. The video has become fully stereoscopic and is popularly known as "the pane." Cars have rear engines and run on doped alcohol. Helicopters and ducted-fan soarers remain beyond economic reach of the masses. Efficient but short-ranged spaceships make regular, uneventful runs to the Moon which is being exploited under half a dozen air-tight domes. The time is more than ripe for a deeper thrust into space.*

Wade Harper, a manufacturer of micromanipulatory instruments, is driving his car westward on a business trip. A short, broad-shouldered and very hairy individual, he has possessed telepathic powers from earliest years but has learned to keep them secret. While riding along deep in thought he picks up the mental impulses of a seriously wounded man. He traces the source, finds a state trooper named Bob Alderson lying in a ditch. Alderson dies in his arms after murmuring that he has been shot by a blond man.

Using the short-wave radio in the trooper's patrol car, Harper calls police barracks. Investigation of the murder gets rapidly under way. Captain Ledsom of the police takes Harper in for questioning, finally releases him.

Since his day is already spoiled by this delay, Harper takes time off to back-track along the route of Alderson's car and by repeated questioning digs up a description of some suspects, namely, three men and a girl in a green Thunderbug. The informant, an oldster in a filling station, had serviced the Thunderbug, noticed that the girl seemed alarmed and sent Trooper Alderson in pursuit of them.

The witness states that the three

men were young, husky, pale-faced, and dressed in green and gray outfits resembling uniforms. Harper phones Ledsom a report on this, then continues to the Schultz-Masters Research Laboratories and completes his private business there.

While returning home on the following day Harper is picked up by troopers and taken for another interview with Ledsom who by now is openly disgruntled. Ledsom reveals that the police have now traced the girl seen with the three suspects and that her story is innocent. She knows nothing of Alderson's killing. Somebody is a liar and it might be Harper himself. The police are about to pump out a deep pond in an effort to find the murder weapon.

Harper refuses a lie-detector test and Ledsom releases him for lack of evidence. Harper returns home, takes up normal work and dismisses the murder from his thoughts.

Shortly afterward, Lieutenant Riley, a friend on the local police, visits him, informs that he is still under suspicion and that Ledsom has requested a check-up on him. He reminds Harper that he has helped police solve several cases in a man-

ner smacking of witchcraft. Harper becomes worried about the chance of Riley and others realizing that he has telepathic powers which he is anxious to keep concealed. He allows Riley to browbeat him into making an attempt to solve Alderson's murder.

Riley obtains the addresses of Alderson's widow and of the mysterious girl whose name is Jocelyn Whittingham. Harper visits the former, learns nothing useful or significant. He then goes to see the Whittingham girl, makes momentary contact with her mind and is shocked by what he encounters. With no compunction he shoots the Whittingham girl, leaves her dead and bolts cross-country to Washington. Before he gets there the newspapers and the video are giving him nation-wide publicity as a wanted killer.

In Washington he surrenders himself to the F.B.I. and finds himself compelled to reveal his telepathic powers in order to gain an interview with high authority. He knows that this revelation will make him a marked man for the rest of his life, but considers that a desperate situation requires desperate measures. Jameson of the F.B.I. takes him before certain men in possession of top secrets where, after much hedging and stalling on their part, Harper gains confirmation of his worst suspicions.

He finds that an expedition has been sent to Venus and that its return is expected in the near future.

Harper then flatly informs authority that the ship already has come back, that its crew is dead, their bodies having been confiscated by a Venusian life form of unknown nature. He denies having murdered the Whittingham girl on the grounds that when he shot her she was already dead, with her body in Venusian possession. He opines that if without prior tuition an alien life form can take over a spaceship and pilot it back home, then it is equally capable of taking over everything on Earth, including every human soul.

His listeners view all this as a lot of melodramatic theory devoid of any evidence in support. But they are alarmed by his mind-reading abilities and by his knowledge of secret data. They agree to consult with the appropriate department about releasing pictures of the three missing pilots.

PART 2

V

King was gone a long time. Eventually he returned with a heavily built, military-looking man named Benfield. The latter grasped three large photographs which he exhibited to Harper as he spoke.

"Know these fellows?"

"No."

"Sure of that?"

"I'm positive. They're complete strangers to me."

"Humph! Can you say that they answer to the descriptions of the trio you have in mind?"

"Fairly well. I could be more definite if those pics were in color. The uniforms convey nothing in black and white."

"They are dark-green uniforms with silver buttons, gray shirts, green ties."

"Apart from the silver buttons the details match up."

"All right. We'll make an immediate check. Who's this witness?"

Harper told him about the oldster at the filling station while Benfield made note of it on a scratch-pad.

Benfield said to Jameson, "We'll try this one first. If the check proves confirmatory we'll run off enough clear copies to enable your men to follow the back trail. Meanwhile, we'll radio a set to your office out there. Won't take them long to determine whether or not this is a gag, will it?"

"A couple of hours," said Jameson.

"A couple of minutes would be better," observed Harper. "And how about taking the heat off me while you're at it?"

"We'll think about that when the report comes in. If it makes hay of your story, we'd better have you examined by a mental specialist."

"That would be fun," Harper assured. "He'd play all the kings and I'd play all the aces. In the end you'd have to put *him* away."

Benfield let it pass. He was taking this tale of telepathic power and all the rest of the story with a sizable dose of salt. The sole feature that impressed him was that somehow or other a wanted felon had succeeded in talking his way into the higher echelons of Washington. That suggested either a modicum of incredible truth or a superb gift of gab. But he was just. He was willing to pursue the matter for the sake of finding any factual grain that might be lying around.

"Put him somewhere safe," Benfield ordered Jameson, "and hold him until we get our reply."

Harper protested, "D'you think I'm going to run off after coming all the way here?"

"No, I don't think so—because you're not going to be given the chance." He threw Jameson a look of warning, departed with the photographs in his hand.

"We'll phone you at your H. Q. immediately we hear," promised King. He stared Harper out of face in an effort to reassert authority, continued to stare at the other's broad back as he went out. But his thoughts skittered wildly around and were not free from fear.

Sitting boredly in Jameson's office Harper said, "Thanks for the lunch. Before long you can buy me dinner as well." He glanced at his wrist watch. "It's three-forty. Why don't they report direct to you? They're your men, aren't they?"

"They have their orders."

"Yes, I know. Orders from somebody else. At this moment you're pondering the fact that this business isn't properly within your bailiwick. The F.B.I. has been called upon to

hunt most everything but prodigal space-pilots. That's how you look at it. And you can't decide whether anything is likely to come of it."

"We'll know in due course."

"They're taking long enough to find out." Harper brooded silently for a couple of minutes, then showed alarm. "What if that oldster is dead and no longer able to identify anything?"

"Any particular reason why he might be?" inquired Jameson, surveying him keenly.

"Yes. Those three may have figured things out for themselves and returned to shut his mouth."

"Why should they do that? Miss Whittingham's evidence cleared them of suspicion. To involve themselves afresh would be a singularly stupid move; it would redirect attention their way after they've succeeded in averting it."

"You're examining it from the wrong angle," declared Harper, "and you err on two counts."

"Name them."

"For one, you're assuming that if guilty they will behave like any other Earthborn thugs who've killed a cop. But why should they? The crime doesn't mean the same to them. For all I know to the contrary they thought as little of it as does some thickheaded farmer who sees a strange bird in the woods, points his gun and shoots it. Maybe it was the rarest bird in the world, now made extinct. Does he give a damn?"

"That's pretty good reason why they should not come back to shut up the witness," Jameson pointed out. "They don't care enough to bother."

"It's nothing of the sort. It's an argument against your supposition that Alderson's death should be their primary concern. I reckon they've a worry far bigger."

"Such as what?"

"Fear of being identified too soon. They're not anxious to be recognized as spacemen and never mind the criminal angle. To be spotted as the missing space-crew would start up a transcontinental hunt. At this stage they don't want to be recognized and pursued. They need time to do whatever they've come here to do."

"Since you're so well-informed," commented Jameson, a trifle sardonically, "perhaps you can reveal their purpose in coming."

"God alone knows. But it's a dirty one. Why else should they try to do it on the sly? An honest motive warrants an open approach. The skulker in the shadows is up to no good."

"You may be making the very same mistake that you've just tied onto me," said Jameson. "You're weighing them up in human terms. That's not a good way of judging alien purposes, is it?"

Harper sniffed his contempt. "In so far as their actions affect us we must look at them from our own viewpoint. It may well be that they are justifiably rated as the greatest adventurers and biggest patriots in Venusian history. But, if their loyal shenanigans are going to cost me a

toenail, they're a trio of prize stinkers as far as I'm concerned."

"I agree with you there."

"All right. Now that old geezer at the filling station cannot possibly finger them for the murder of Alderson. The most he can do with respect to that is point suspiciously. His evidence wouldn't hang them in a month of Sundays." He leaned forward, gaze intent. "But what he *can* do is exactly what your men are trying to get him to do right now. He can look at three pictures, give the nod and start the hunt. There's only one sure way to prevent him and that is by closing his trap for keeps before it's too late."

"That's clear enough reasoning," said Jameson, "but it has one major flaw."

"What is it?"

"All the news channels have publicized details of both the Alderson and Whittingham killings. Everyone from coast to coast knows that you're wanted for the latter and suspected of the former. The three fugitives know that they don't fit in this picture and that, in any event, your witness' description of them would fit a thousand others. There's nothing whatever in the news to suggest the remotest likelihood of a witness being shown photographs dug out of confidential files in Washington. So why should they deduce that possibility?"

"Because I shot down the Whittingham girl."

"I don't understand," confessed Jameson, frowning.

"Look, I've given you the facts as I saw them. They picked up that girl for some reason or other, probably because the opportunity presented itself and they wanted to try their technique. Maybe they're missionaries making converts and pass up no chances on the general principle of the more the merrier. Anyway, they turned her into another of their own kind. She ceased to be Jocelyn Whittingham but continued to masquerade as such. Don't ask me how it was done because I don't know and can't guess."

"Well?"

"The big question now is: Were they able to learn and remember that girl's Earth-identity? Or was it something they failed to record either because they viewed it as of no consequence, or because it was incomprehensible to them?"

"Go on," Jameson encouraged.

"If they don't know her identity, the news of her death will mean nothing to them. It will look just like any other sordid murder and they won't realize they're linked with it in any way. But if they *do* know her identity—"

"Don't keep me in suspense," pleaded Jameson.

"The killing will get them onto their roller skates and going at top speed. They'll want to know why she was killed. They'll want to know whether she died because a Venusian can be recognized and, if so, how and by whom. They can see with half an eye that real knowledge of

their presence will inevitably be linked with that space-expedition and they'll be eager to find out whether there's time to break the linkage by cutting a couple of throats."

"Including yours."

"Yes. I'm the sacrificial goat. The news channels have shouted my name and address all over the shop and invited them to come and get me—if they can. It won't be a quick death, either. They'll do me in slowly, very slowly."

"What makes you say that?"

"So far as I can guess they've one weapon and one only. But it's a formidable one. They can double as human beings without possibility of detection except by some freak like myself. It's of the greatest importance to them to find out how I did it. Without that knowledge they can't take steps to prevent it happening again. They can't counter a menace without knowing the nature of it. They will have to get the truth out of me in any way it can be done, no matter how bloody and no matter at what risk. Otherwise there's no telling how many more folk can tag them, or when the next moment will be their last. Their lives wouldn't be worth living."

"Telepaths aren't ten a penny," Jameson pointed out. "You've said so yourself."

"But *they* don't know that. They're left guessing in circumstances where no guess is too far-fetched. To them, it might well be that every red-haired human can smell them—and there are a deuce of a lot of redheads around. They've *got* to know how it's done."

"You're no carrot-top," said Jameson, "but, if some day we find you lying around without your scalp, we'll consider it fair evidence of your veracity."

"Thanks," conceded Harper. "You boys have a good time over my body. Enjoy a few hearty laughs while there remains something to snicker about. Won't be long before you'll wish you were me!"

"You know I was only ribbing. I—"

He grabbed the phone before it had time to give a proper whirr, held it to his ear. Harper came to his feet, looking anticipatory.

"Same as before," Jameson told him, replacing the instrument and reaching for his hat. "They want us over at once. We might as well have stayed there in the first place."

"Something has broken," declared Harper as they hustled outside and clambered into the car. "If those pics had proved to be duds, they'd have said so, with acid for sauce. They wouldn't drag us ten blocks merely to tell us the check proved a flop. Or would they? After all, it's the taxpayers' gas we're using."

Jameson sat tight-faced and offered no comment.

VI

There were only two men waiting this time. One had stern, leathery features famous throughout the world: General Conway, tall, gray-

haired, distinguished. The other one was Benfield, now decidedly grim.

"So!" rumbled General Conway, fixing Harper with a cold eye. "You are the mind reader?"

"Putting it that way makes me seem like a vaudeville act," said Harper, far from overawed.

"Quite probably," agreed the general, thinking it wasn't so far removed either. He examined the other carefully from the shoes up, appraising the conservative yellow tweeds, letting his gaze linger longest on a pair of thick and exceedingly hairy wrists. His mental diagnosis was not flattering: it determined the subject to be a powerful and presumably intelligent man who would have the misfortune to look like an ape when in officer's uniform. Too broad, squat and hirsute to fit the part of a captain or colonel.

Harper said informatively, "That's nothing. You ought to see me naked. I resemble a curly rug. Hence the word rugged."

The general stiffened authoritatively. Jameson looked appalled. Benfield was too preoccupied to have any reaction.

"If you know what is in my mind, there's little need to speak," declared General Conway, annoyed at the loss of his privacy. "What does it tell you?"

"An awful ruckus has started," replied Harper without hesitation. "And I'm certified sane."

The other nodded. "Your witness has confirmed that the men in that car were the same three who set out for Venus about eighteen months ago. The F.B.I. is following their trail forward and backward and already has found two more witnesses who say the same." He rested on a table-edge, folded his arms, gazed steadily at his listener. "This is a most serious business."

"It'll get worse," Harper promised. "If that is any consolation."

"This is a poor time for levity," reproved the general. "We are treating the matter with the importance it deserves. All forces of law and order in the west are combining in effort to trace that Thunderbug back to its starting-point in the hope that the ship may be located in that area. A forward trace is also being made despite that it's likely to prove futile, the machine having been abandoned by this time."

"Neither the ship nor the car matter very much. It's those three rampaging—"

"We are after those as well," Conway interrupted. "All police, military and ancillary organizations have been or soon will be alerted. Photographs, fingerprint formulae and other necessary information is being distributed as fast as we can produce. The capture is being given top priority, all other criminological investigations to be dropped pending its achievement. Unfortunately, at this stage we cannot warn the public as a whole without creating widespread alarm and consequences that may get out of control."

"Good enough," approved Harper. "So this is where I go out."

"On the contrary, this is where you stay in. We have got you and intend to keep you. There's a war on and you're drafted."

"Then I apply for indeterminate leave forthwith."

"Permission denied," snapped Conway, too concerned even to smile. He walked around the table, sat behind it, let his fingers tap restlessly on its surface. "The air forces are out in full strength scouting for that ship. Every civilian plane that can be mustered is under orders to assist. We have confiscated the bodies of that girl and the trooper, handed them over to scientists for special examination. Everything that can be done has been or soon will be done. The issue of the moment is that of how to deal with you."

"Me?"

"Yes. There are a lot of questions that must be answered. Firstly, have you any explanation of your telepathic power? Can you say how it originated?"

"No."

"It just happened?"

"So far as I can recall I was born that way."

"Hm-m-m!" Conway was dissatisfied, went on, "We are making exhaustive search into the backgrounds of your parents and grandparents. If possible, we must discover the reason why you are what you are."

"Personally," remarked Harper, "I couldn't care less about the reason. It has never interested me."

"It interests us. We must determine as soon as we can whether any more of your kind may be hanging around and, if so, in what number. Also whether there is any positive method of finding them and conscripting them until this crisis is over."

"After which they in turn will be treated from the crisis viewpoint," thrust Harper. "And your big problem will be how to put them out of harm's way until such time as they may be needed again."

"Now see here—"

"I know what you're thinking and you cannot conceal it from me. I know that authority is squatting on the horns of a large and sharp-pointed dilemma. A telepath is a menace to those in power but a protection against foes such as we are facing right now. You cannot destroy the menace without thereby depriving yourselves of the protection. You cannot ensure mental privacy except at the prospective price of mental slavery. You're in a first-class jam that doesn't really exist because it's purely imaginary and born of the conditioning of nontelepathic minds."

Conway made no attempt to dispute this vigorous revealing of his thoughts. He sat in silence, his cold attention on Harper, spoke only when he had finished.

"And what makes you say that there is no such quandary?"

"Because all the irrational bigots swarming on this cockeyed world invariably jump to the conclusion that anyone radically different from themselves must be bad. It inflates

badly shriveled egos to look at things that way. Every man his own paragon of virtue and goodness." He glowered at General Conway and said with ire, "A telepath has a code of ethics fully as good as anyone else's and perhaps a bit better because he has to beat off more temptation. I don't listen unless circumstances make it necessary. I don't hear unless I'm shouted at."

The other was blunt enough to appreciate straight talk. He was openly impressed. Leaning back in his chair he surveyed Harper afresh.

"We've done a deal of checking on you already. You heard Trooper Alderson from a distance of approximately six hundred yards. Without listening, I presume?"

"I heard his death-cry. On the neural band it's as effective as a scream. I couldn't help hearing."

"You have helped nail a number of wanted criminals and it is now obvious how you did it. But you never listen?"

"Guilt yells across the street. Fear bellows like an angry bull."

"Is there *anything* that broadcasts on a level sufficiently muted to escape your attention?"

"Yes—ordinary, everyday, innocent thoughts."

"You do not listen to those?"

"Why on earth should I bother? Do you try to sort out every spoken word from the continual hum of conversation around you in a restaurant? Does a busy telephone operator take time off to absorb the babble going through her switchboard? If I went around trying to pick up everything that's going on, I'd have qualified for a straitjacket ten years ago. Continual, ceaseless yap can torture a telepath unless he closes his mind to it."

By now Conway was three-quarters convinced. His mind had made considerable readjustment. He resumed his table-tapping, cast an inquiring glance at Benfield and Jameson. They immediately put on the blank expressions of impartial onlookers not qualified to make decisions.

"I understand," continued Conway, "that to date you have not encountered another telepath?"

"No," agreed Harper regretfully.

"But, if two of you passed by without listening, neither of you would become aware of the other's existence?"

"I suppose so. But I couldn't swear to it. If we radiate more powerfully than the average human—"

"Yes, but your lack of contact is no proof of your uniqueness? For all we know to the contrary there may be fifty or a hundred telepaths in this very city?"

"I think it most unlikely but wouldn't define it as impossible."

"What is your effective range?" asked Conway.

"About eight hundred yards. It varies from time to time. On rare occasions I have received at three times that distance. Other times it drops to a hundred or less."

"Do you know the cause of such variation? Is it due to the nature of

surroundings, blanking by big buildings or anything similar?"

"I could not say for sure, not having subjected the matter to systematic test. Surroundings make no difference and that's all I'm certain about."

"But you have a theory?" Conway pressed.

"Yes," admitted Harper. "I suspect that on any given occasion my range is determined by the amplitude of the other person's radiations. The more powerfully he broadcasts the greater the distance over which I can pick him up. The weaker, the less a distance. As I've said, it would require scientific tests to establish the truth or falsity of that notion."

"Are you willing to undergo such tests?"

"I am not," declared Harper, showing pugnacity.

"Why not?"

"The immediate problem is not that of what to do about telepaths. It's that of what to do about invading Venusians. Nobody is going to use me for a guinea pig. Go pick on the quarry you're already hunting. They've done plenty and aim to do a lot more. My only crime is that of performing a public service."

"Don't view it in that light, Mr. Harper," Conway soothed. "We appreciate to the full the excellent part you have played. The trouble is that we're not satisfied. We want more of you. We want all you can give. In fact we need it so badly that we demand it as of right."

"What do you require of me?"

"All the information we can get out of you now and perhaps some action later."

"Go ahead. Let no man say Wade Harper was unable to suffer."

Conway signed to Benfield. "Switch on that tape-recorder." He returned his attention to Harper. "This one is of the utmost importance. I want you to answer it with the greatest clarity you can command. What impelled you to shoot Jocelyn Whittingham?"

"That's a tough question," Harper replied. "I cannot translate it in terms you don't understand; it's like trying to describe a rose to a man blind from birth."

"Never mind. Do your best."

"All right. It was somewhat like this: you're in your wife's bedroom. You notice a new and pretty jewel box on her dressing table. Full of curiosity, you open it. The thing contains a live whip-snake. The snake sees you the same instant. It leaps out. Despite the shock you act fast. You swipe it in midair, knock it to the floor, crush it under heel. That's how it was."

"I see." Conway stared at him thoughtfully, then asked, "Can't you express it in manner more in keeping with what actually happened?"

"She started up the steps. I knew she might be the girl I was seeking. I made a stab at her mind for the sole purpose of identifying her. The moment I touched I realized what I had touched. At the same moment—"

"*What* did you touch?" inquired Conway.

"Something not human. I cannot describe it more accurately. I planted a telepathic hand fairly and squarely on the slimy mental field of a non-human entity. At the same instant it felt my touch. That was additional confirmation if any were needed, because no normal human being can sense a telepathic probe. I realized several things in that split-second. Firstly, she didn't know whence the probe had come. She had no directional sense such as I possess. But she correctly assumed that it came from me because I was in plain sight and already racing toward her."

"She did not *know* it was you?" repeated Conway. "You mean she was in no way telepathic herself?"

"I hadn't any evidence of it. There was only that abnormal sensitivity which, I suppose, has been developed as a defense-mechanism some place else. She did know beyond all doubt that suddenly and without warning a strange and dangerous mind had lifted her mask and seen beneath. She gave out a panicky thought that she must get away, she must warn the others that they're not as well-hidden as they think, that they *can* be exposed."

"A-a-ah!" Conway displayed hopefulness. "So she knew the precise location of these others? She knew how to get in touch with them?"

"If so," said Harper, "her mind did not admit it. Things were moving fast. We were both thunderstruck by the encounter. Her mind

was yelling, *'Escape, escape, escape!'* while mine ordered imperatively, *'Stop her, stop, stop . . . kill, kill!'* I shot her down without any compunctions whatsoever. I'd quite forgotten that she was a girl or had been a girl. For the moment she was something else, something that had to be laid good and cold. I gave her the magazine right through the head. I heard the alien mentality cease sizzling and fade to nothingness. That showed it could die just the same as anybody else."

"Then you went away without making further examination?"

"I did. I went fast. I'd no time for further horsing around. I didn't dare risk being picked up anywhere but here. To tell this story in any police barracks or sheriff's office, where they didn't know the score, would eventually land me in an asylum."

"Couldn't you have saved time, trouble and anxiety by calling us long distance?"

"How far would I have got that way? Some underling would have listened, smirked knowingly and sent police to the booth to pick up a loony. I've had a tough enough job reaching the right people in person. At that I reckon I'm lucky. I hope to make it to the Pearly Gates with less trouble."

None of the listeners relished that remark but were unable to deny the truth of it. A formidable guard of minor officials stood between the high executive and a beseiging force of malcontents, theorists, halfwits and world-doomers. Perforce they also held at bay the rare individual with something genuinely worth hearing.

General Conway harumphed, decided that there were no satisfactory methods of overcoming this difficulty, went on to say, "You have made contact with an alien life form. So far as we know you're the only one who has done so and remained able and willing to talk about it. Can you add anything that may help us to determine the true nature of the foe?"

"I didn't see it with my own two eyes. Therefore I cannot assist you with an accurate description."

"I understand. But just the same you must have gained some kind of an impression."

Thinking it over, Harper conceded, "Yes, that's true."

"Let us have it. No matter how vague or fleeting, we need every datum we can get on this subject."

"For no apparent reason I felt that alien ownership of another body is a natural phenomenon. That is to say, I knew more or less instinctively that the thing occupying the body of Jocelyn Whittingham was functionally designed for such a purpose, was perfectly at home and knew how to use what it had gained. The girl was a human being from toes to hair in all respects but one: another and different life-spark had been substituted."

"Which suggests that its nature is wholly parasitic?" asked Conway. "It

normally exists in possession of some other life form?"

"Yes. It's an old hand at that game."

"And that in turn suggests that when it acquires another body it also gains the data within the brain, all the knowledge, the memory and so forth?"

"Undoubtedly. It could not survive without doing so. Otherwise its own incompetence would betray it at once."

Turning his attention to Benfield, the general remarked, "The inevitable deduction is that Venus harbors various life forms some of which are the natural prey of a possessive parasite. Also that this parasite is capable of taking over a form higher than any in its own habitat. It can adapt right out of its own environment and, if I may put it that way, it can raise itself by its own bootstraps."

Benfield nodded agreement.

"Also," continued Conway, "it is probably microscopic or germlike. That's my guess. I'll have to leave that angle to others more expert. They'll be able to make shrewder estimates of its characteristics."

"It would help more than somewhat if we could discover how that girl was mastered," Harper pointed out. "Her body might tell the story."

"That is being looked into. We have confiscated her corpse despite violent objections from her relatives."

Harper looked at him, eyes glowing. "Which of them raised the biggest outcry?"

About to add something more, Conway paused, closed his mouth, opened it, registered momentary bafflement.

"Why?"

"We Venusians must stick together."

"You mean—?"

"Yes, I mean what you're now thinking."

Firming his lips, Conway reached for the phone, ordered, "Take the entire Whittingham family into safe keeping at once. No, it is not an arrest. There are no charges. Tell them it's for their own protection. Eh? If their lawyer chips in refer him directly to me."

"That will do a fat lot of good," remarked Harper. "If one or more of the Whittinghams is no longer of this world, you're helping him create a bunch of Venusian cops out west."

"It's a risk we'll have to take."

"Not necessarily. You could put them in animal cages and feed them with long tongs. Anything, anything so long as they can't get near enough to help themselves to their own guards."

"That would be gross violation of their constitutional rights. We could get away with such tactics only by justifying them before the public. To do that we must release information that we wish to preserve, at least for the time being." His eyes questioned Harper as if to say, "What's the answer to that?"

Harper took it up promptly. "Tell them the truth. Tell the Whittinghams that Jocelyn died of a new, malignant and highly contagious disease. They must be isolated until found free from it. The black plague again."

"What, when they know she was shot?"

"*I* had the disease. I was raving mad with it. I touched her, contaminated her. She's lucky to be dead. You've got to give a clean bill of health to whoever handled her afterward. Scare them with a yarn like that. Some clause in the health laws can be finagled to cover their incarceration. No protectors of civil liberties are going to bawl about the freedom of suspected lepers. And the story will be substantially true, won't it?"

"You may have something there." Conway used the phone again, gave instructions, finished, "Consult Professor Holzberger about the technical description of a suitable pretext. What is needed is something strong enough to convince but not strong enough to cause a panic." He ended, said to Harper, "And now what?"

"When there's a chance, let me go out there to look them over. If I find them all clean, give them a mock check-up by some worried-looking medico, then let them go. They'll be too relieved to gripe."

"But if one of them is possessed?"

"I'll smell him at first sniff. He'll know it, too. Keep him at all costs. When the others have gone, call him dead and pull him apart. You could do that without a qualm. So far as humanity is concerned he's already dead. You'll be carving an animated corpse. With luck you might be able to isolate whatever is combing his hair."

Conway frowned. Jameson looked slightly sick. Benfield didn't enjoy it either; he was visualizing his hands shaving himself at another's behest.

"We'll take that up shortly," said Conway. "There is one more cogent point yet to be considered. You say that the instant you recognized the Whittingham girl her immediate thought was of escape?"

"Yes."

"But not to a specific place?"

"No."

"Therefore her impulse to flee was instinctive and no more?"

"Not entirely. She experienced the shock of somebody deprived without warning of a long-established and greatly valued truth, namely, that recognition is impossible. She was confronted with an irrefutable datum contrary to all experience. She felt the dire need to get away from me and tell the others."

"Which others? *Where?*"

"I don't know."

"You know only that *she* didn't know?"

Harper fidgeted around, brooded at the floor. "Frankly, I'm unable to give a satisfactory answer. Possibly she didn't have the remotest notion where the others might be and in that respect had been made irra-

tional by the crisis. Or she may have known but succeeded in suppressing the knowledge, which I doubt. Or—"

"Or what?"

"She may have possessed some alien sense which enables her kind to contact each other. A sense we haven't got and cannot understand. Something like the homing instinct of pigeons or dogs, but on a species basis."

"But you are convinced that she was not telepathic?"

"Not in the way that I am."

"In some other way, perhaps?"

"Nothing is impossible," said Harper, flatly. "It is beyond my power to list the attributes of things native to some place umpteen millions of miles away after a one-second glance. Catch me another dozen. I'll take a longer look and then I'll tell you more."

Responding to Conway's gesture, Benfield switched off the tape recorder.

"Catch you another dozen," echoed Conway. "How the devil are we going to do that? We know of three and it's not beyond our resources to find and seize them sooner or later. Getting any others who may be around is a different matter. We have nothing to go upon, no details concerning them, no way of identifying them." His gaze came up, leveled on Harper. "Excepting through you. That's why you're drafted. We require your services to test every suspect we can lay hands on."

"So I'm expected to stay put, wait for your line-ups, look them over and say yes or no?"

"Exactly. There is no other way."

"There is," Harper contradicted.

"For instance?"

"You could use me for bait."

"Eh?"

"They want my matted corpus as badly as you want theirs. They need to learn what makes me a nuisance fully as much as you need to learn about them. In that respect they have an advantage. You must try to grab an unknown number of unknown pseudo-people. They have to snatch one man whose name, address and car tag number have been shouted all over the country. I'm the most desirable subject for vivisection they ever heard about since their last picnic on Saturn. Give them half a chance and they'll swarm around me drooling. All you need do is step in and pinch everyone holding a scalpel."

Conway breathed heavily and objected, "It's a risk, a grave risk."

"Think I'm tickled pink about it?"

"If anything should go wrong, we'll have lost our most effective counter-weapon and be without means to replace it."

"The beauty of that will be," said Harper, cheerfully, "that I will no longer care one-tenth of a damn. The dead are splendidly indifferent about who wins a war or gains a world."

"Perhaps not. But we'll still be living."

"That won't concern me either.

Right now my great-grandmother doesn't give a hoot about the hole in my sock."

"And *you* may still be living," retorted Conway. "Even though dead."

"I'll be a goner either way," Harper gave back with ghoulish philosophy. "What if some midget alien *is* wearing me like mink?"

He grinned at them, enjoying the repulsion in their minds.

The general was like a chess player trying to decide whether mate could be ensured by sacrificing his queen. He was far from positive about it but could think up no satisfactory alternative. To his military mind, telepaths were expendable providing the supply of them was unending. Unfortunately they were neither shells nor guns. They could not be manufactured to order. So far as could be determined he had one and only one telepathic weapon in his armory. If that one went, there'd be no more.

Even if people with supernormal faculties existed in sufficient number to dispose of this extraterrestrial menace once and for all, the situation would remain critical. There would come the aftermath. What of them? Could they be trusted to let the world go by? Or would experience of recent events waken them to their own power, tempt them to unite and confiscate the planet? They'd have a good excuse for doing so, an excuse convincing enough to sway the masses: only we could save you last time, only we can save you next time.

Conway was still stewing it over when again his phone called for attention. He took it meditatively, listened, abruptly came to full attention.

"Who? When did this happen? Yes, yes, you'd better." He cradled it, scowled forward.

"Something wrong?" asked Harper.

"You know what's wrong. You must have heard the details being recorded in my mind."

"I wasn't listening. I was full of my own thoughts. I can't make noises at myself and at the same time take note of other people's cerebral trumpetings."

"One of the witnesses is dead; the old man at the filling station."

"Murdered?"

"Yes. It happened a couple of hours ago but they found him only within the last fifteen minutes. Whoever did it has a good headstart." Conway cocked an inquiring eye at Jameson. "I don't know what to think of it. You've far more experience in such matters. Do you suppose this could be nothing more than coincidence?"

"How was he killed?" Jameson asked.

"They discovered him lying by his pumps, his skull crushed by a single blow from a heavy instrument. They say it looks as if he filled somebody's tank and was struck down when he tried to collect."

"Any evidence of robbery? Had

his pockets been emptied or the cash register cleaned out?"

"No."

"Hm-m-m! That doesn't indicate that robbery wasn't the motive," Jameson opined. "The culprits may have been scared off before they could complete the job. Or maybe they were joyriders who slugged him for a free tank of alk, overdid it and made it murder." He pursed his lips while he mused a bit, finished, "These isolated filling stations get more than their fair share of rough stuff and have for years. I think it's quite likely that this is a genuine coincidence. To treat it as of special significance may cause us to lose time chasing up the wrong alley."

Conway turned attention to Harper. "The police out there feel hamstrung because they're under strict orders to abandon everything in favor of the hunt for missing pilots. Yet one investigation may be part of the other and I don't want it to be temporarily ignored if there is a connection. On the other hand, I'd rather not countermand orders unless such a connection exists. What is your opinion?"

"If Venusians did it to shut the old fellow's trap, they arrived too late. He saw their photos and set the fireworks going before they could stop him. But *they* wouldn't know that."

"You think they did it and therefore this is not a coincidence?"

"No," said Harper, carefully. "Jameson has given his viewpoint and I'm trying to consider its opposite. I'm telling you that if those three are aware of the identity of the girl they converted, her death will give them the shakes. Two and two make four on any planet. They'll add up the news, make it the correct total, decide she'd been found out somehow, God knows how."

"And so—?"

"They know a nation-wide hunt will be after them unless they can cover up. Even that will do no more than delay matters but delay is all they need. If they can postpone capture long enough, it will come too late.

"Many people spotted them in that Thunderbug but only two saw them actually with the girl, took a close look at them at the time. Those were Alderson and the oldster. The former is too dead to study pictures. It would help them some to have the latter in the same condition. That's how they'd look at it. The basic requirements of survival can be seen by any type of mind no matter where it's from.

"Then why were they so slow to get at him?" commented Conway. "They dealt with him three to four hours behind time."

"I killed that girl and came here as fast as I could go and have been hanging around all day. The news didn't break until sometime after I'd left. If, when they saw the news, they had to rush back as far or perhaps farther they must have moved as swiftly as they dared. It takes time

to cover territory even in these days."

"I suppose so." Doubtfully, Conway shifted his gaze to Benfield. "Have you any ideas?"

"Yes, general. I think it best to pursue this matter on the principle of overlooking nothing."

"That's the boy," approved Harper. "With all the troops and police littering this country we should be able to spare a couple of dozen to chase a possibility. The grave loss of manpower won't make us topple any quicker."

Conway did not approve the humor which smacked to him of unwarranted sarcasm. But it served its purpose of stinging him into immediate action. He handled the phone with the air of being fed up holding it, made his call.

"Williams, about that filling station murder. I want it looked into. Make it quick and thorough. Yes, orders are suspended with respect to this case only. It may be linked with the search. If so, one of the wanted men has been in that area today. Call me and report directly you make progress." He ended, gave a challenging look at the others. "That settles that. There's little more we can do until we make our first capture—and it's to be hoped we get him alive."

"It's also to be hoped that one will lead to the others," put in Benfield.

"And it's further to be hoped that sometime before Christmas somebody will make up their mind about accepting or rejecting my offer to dangle on the hook," said Harper.

"Your first job is to check the Whittingham family," Conway shot back. "After that we'll consider what to do with you next."

"Then let's go." Harper waved a familiar good-by to General Conway, performing it in the manner of a rookie too raw to know better. Conway involuntarily bristled at him, a fact he found most pleasing.

"There's no sense in going out of your way to irritate the old boy," reproved Jameson when they had exited and reached the car. "He has troubles enough."

"I was reasserting the freedom of the individual at the moment when it's likeliest to become disputed," snapped Harper. "And furthermore, a cat may look at a king. That holds good though the heavens fall."

Jameson did not choose to argue the point.

Back at headquarters Jameson said, "The sooner you get out there and do your stuff, the better. We'll send you by plane or 'copter. Sit down and wait—I'll find out what can be done."

"You can restore my good character while you're at it," Harper suggested. "Cancel that call for me. I don't like it even if it is being ignored. Priority of pilot-search won't prevent some sharp-eyed cuss grabbing me if he notices me right under his nose."

"We'll tend to that eventually.

Meanwhile I'll send a couple of agents with you, to be on the safe side."

"Think I can't look after myself?"

"It's Conway's order."

"Oh, all right." As the other went through the door, Harper called, "And I want my gun back. It's my property, isn't it?"

Jameson returned in two minutes, tossed him the weapon and a large brown envelope. "Study that while I get things moving—all planes are busy and you'll have to use a 'copter." He departed again.

Tucking the gun under his left arm, Harper extracted the envelope's flap, slid out three full-plate glossy photographs. Each had a typed slip of data attached to its back. He examined them closely.

The first was of William Gould, twenty-eight, test-pilot-in-chief, a frank-faced, blond-haired, husky individual who weighed one hundred eighty pounds and had a half-moon scar on the left brow. The thinner, dark-haired face smiling from the second picture was that of Cory McDonald, twenty-four, test-pilot and computer, a wiry type of one hundred fifty-five pounds, no identifying marks on body. Picture number three showed the thoughtful, serious features of Earl James Langley, twenty-seven, test-pilot and astronavigator, dark-haired, one hundred sixty-two pounds, small mole on right thigh, white scars on both kneecaps.

"Gould, McDonald and Langley," recited Harper to himself as he shuffled the photos to and fro and memorized the faces. "Gould, McDonald and Langley. Three good boys who went away full of hope and came back full of hell. God rest their souls!"

He felt vengeful as he looked at them. Didn't seem right that humanity's outward growth should be paid for by such as these. The salt of the earth thrown away for Earth's sake. And the payment they had made was not in full. They had given their minds. When their own kind found them and destroyed them they would also have given their bodies. Payment would then be complete.

Not for one moment did he doubt that should he come face to face with one of these three he would shoot him down like a rabid dog, as unhesitatingly as he had shot Jocelyn Whittingham. It was easier for him than for others to perform such cold-blooded execution; mentally he could *see* the terrible emptiness of the human shell and the thing squirming within.

Three fine young men.

Three rotten apples.

"Damn!" he said, loudly. "Damn!"

"What are you cussing over?" inquired Jameson, coming through the door.

"Somebody's sons—and what's been done to them."

"Don't bother your head about them. We've a bigger worry, namely, that of what they're doing to others."

"I know. But it's in my nature to deplore the deplorable." He returned the photographs to the envelope, handed it over. "If I can have copies, will you see they're put in my car? They're too large to fold into my pocket."

"We're printing thousands of smaller ones, wallet-size. You'll get a set in due course." Jameson gazed expectantly toward the door. Two men entered. They were young, lean, well-dressed, had an air of quiet competence. Jameson introduced them. "Meet Dan Norris and Bill Rausch. Try getting away from them."

"These are the escort?"

"Yes."

"Hope I won't bore you, boys," said Harper. "When will you be ready to go?"

"Right away," Jameson informed. "An army 'copter is on the roof."

Accompanied by the two silent agents, Harper rode an elevator to its limit, gained the waiting machine which proved to be a big thirty-seater with port and starboard rotors.

Engines whined into the high note, rotors spun into circles of light. The 'copter made one small bounce then soared rapidly. At five thousand feet the tail jet spurted flame and sped them westward.

Three and a half hours later they landed in the ornate grounds of a state isolation hospital. An agent met them as they stepped to the ground, identified himself as Vern Pritchard.

"You're holding the Whittinghams here?" Harper asked.

"Yes. There are five in the family. They swallowed our story of possible contagion and came without protest. They fear they may be incubating something and can hardly wait to find out."

"None of them have tried to escape?"

"No," said Pritchard.

"Or communicate with somebody at a distance?"

"No."

"Whereabouts are they?"

Pritchard pointed. "In that annex over there."

Gazing meditatively at the place indicated, which was about four hundred yards away, Harper said after a while, "They're O. K. You can let them go."

Incredulity came into Pritchard's features as he protested, "But you haven't *seen* them!"

"I don't need to."

"Well, my orders are to be governed entirely by what you say. I take it that you do know what you're saying?"

"I do. I say they're clean. You can release them."

"All right." Hopelessly baffled, Pritchard covered himself against a possible blunder by saying to his fellow agents, "You two are witnesses to this."

They signified agreement, followed Harper back into the 'copter as Pritchard walked toward the annex. The 'copter rose, started the return trip.

"Thank the Lord not everyone knows what's wrong with me," remarked Harper, thereby stimulating companion minds into revealing channels.

Mental reactions showed that they didn't know either. Jameson had told them no more than was strictly necessary. The powers-that-be were trying to hide two menaces from the public, not just one.

Authority was trying to conceal a human pryer as well as an inhuman enslaver. The idea was to use the former to destroy the latter—and then decide the fate of the former.

VII

Moira stood like one paralyzed when he marched surlily into the

office, planted himself behind his desk and commenced rummaging through the correspondence that had accumulated.

After a while he glanced up and growled, "Well, what's eating you? Have I turned into a purple opprobrium around here?"

"No, Mr. Harper." She sat down weakly, still looking at him wide-eyed. Her ears were perked for sound of oncoming sirens while she wondered how to duck the resulting fracas.

"Don't let your mouth hang open that way. It makes you resemble a half-starved carp. Where's the Pest Control progress report? They're bellyaching already."

She flew to a cabinet, jerked open a drawer, riffled its cards, extracted one and gave it to him. Her mind was whirly with the belief that she was alone with public enemy number one and somebody ought to do something about it.

"Mr. Riley has been around several times," she informed, making it sound like a warning and hoping he'd take the hint. "He said he'd call again today."

"He would, the big ugly bum." He studied the card, his expression sour. "Umph! When I say six weeks I mean six weeks and not six days. Dear sirs, in reply to your query of yesterday's date—"

Grabbing her pencil she scribbled with frantic haste. He spouted another forty words, knew she was making a hopeless mess of her script. He ceased dictating, spoke with a judicious mixture of sorrow and severity.

"See here, Lanky, I am not a convicted criminal. During my absence I have disembowled none save the few hundred who deserved it. I am not wanted by cops, judges, wardens or army recruiters. I am loved only as I have been loved since days of yore. Now pull yourself together and apply your mind to the job. Dear sirs, in reply to your query—"

This time she managed to take it down without error. She slipped paper into her machine, adjusted it, paused expectantly as heavy footsteps approached the office door.

"Here he is," announced Harper, with mock tenseness. "Dive under the desk when the shooting starts."

Moira sat frozen, one finger poised over a key. She dared not look round lest what she saw proved him to be deadly serious. She listened for the faint rustle of clothes indicating that he was drawing his gun.

Next moment Riley bashed open the door in his usual elephantine manner, took the usual two steps to reach the desk. If his scowl had forced his eyebrows an inch lower, they'd have served as a moustache. He splayed both hands on the desk while he leaned across it to stare into the other's eyes. Behind him, Moira felt faint with relief, gave the key a tentative tap.

"Now," said Riley, hoarsely, "you're going to tell me what is happening right and left. Why are you wanted for murder one moment

and not wanted the next? Why do they list you at top one day and remove you from the bottom another day? Why can't they make up their minds whether you're a hirsute hoodlum or not?"

"Life is just a—"

"Shut up! I haven't finished yet. Why has the F.B.I. emigrated wholesale into this area and calmly confiscated my four best squads? Why have they staked this crummy joint from the roof, the cellars, across the street, up the street, down the street, at both ends of the street and in half a dozen adjoining streets? Why—"

"Why do you turn Moira into a nervous wreck the minute my back is turned?" Harper demanded.

"Me?" Riley fumed a bit. "You're inventing things in effort to change the subject. But it won't work, see? Why—"

"You looked at her and *thought* things," asserted Harper.

Riley crimsoned and bawled, "All right. I get it. You refuse to talk. You know I can't make you talk. And you're enjoying the situation. It gratifies your simian ego." He let his voice drop a couple of decibels, went on, "Would your lordship grant me the favor of one question? Just one little question, eh?"

"You may voice it," said Harper, trying to be lordly.

"To whom must I go to get the answers?"

"General Conway."

"Jumping Jehoshaphat!" ejaculated Riley. "Is it *that* important?"

"Unfortunately, yes. And if they haven't seen fit to give you the details I mustn't do so either. If I told you all, I'd usurp authority and I'm given to understand it's a dreadful thing to usurp authority. It's the unforgivable sin. It breeds anarchy with all its attending features of godlessness, promiscuousness and every other form of untaxable naughtiness. Compile your own list—you know more about the wicked." He reached for another letter from the waiting pile. "Close the door gently as you go out. The glass won't hold under more than another two of your assaults."

"I could assault somebody right now," Riley informed, showing big teeth. "Two burglaries, one hold-up and one case of arson last night. I'm supposed to dismiss them with a light laugh. I'm supposed to concentrate exclusively on looking for three guys named McDonald, Langley and Gould and do it while robbed of four prowl cars. Nothing else matters but finding a trio of toughies against whom no criminal charge has been entered."

"Nothing else matters," Harper agreed.

Riley leaned closer and whispered, "Be a pal and tell me—what have they done?"

"Ask Conway."

"Thanks for nothing." Riley rattled the glass as he departed.

"Director of Research, Swain Laboratories, Trenton, N. J.," Harper dictated while Moira snatched at her

pencil. "In response to your inquiry for slow-motion pneumatic micro-manipulators suitable for use with type-Z electron microscopes, we have pleasure in quoting for our—" He glanced at the door which had opened "Well?"

Agent Norris said, "We heard the conversation through the mike. What's that police officer to you?"

"A friend. He thinks he's entitled to my confidence." He sniffed, rubbed his nose, added, "I think so, too."

"Why do you say that?"

"I know him of old. He's to be trusted."

Make note of Harper's friends and intimates, droned Norris' mind, repeating orders in mistaken secrecy. *They are to be thoroughly checked.* Vocally, he informed, "We let him through to you, being who he is. But we were wondering why he should come out with such peremptory demands for an explanation. What is good enough for the commissioner ought to be plenty good enough for him, shouldn't it?"

"He's in a privileged position so far as I'm concerned."

"Are you sure he did not have an ulterior motive in cross-examining you?"

"I did not look to see. I don't peer into everybody's nut, regardless. Besides, I'm busy trying to rescue myself from imminent bankruptcy. What motive could he have?"

"You can guess as well as anyone else—except that you don't have to guess," said Norris. "In a situation such as this it's wise to suspect everyone including your own mother."

He went out, joined Rausch in the machine shop. Harper continued with his mail. When lunchtime arrived and Moira had gone out to eat, Harper summoned Norris to the office.

"Moira is a nice girl. She tops me by three inches because I've pulled both her legs so often that they've stretched. But we get along all right."

"What's this to me?" Norris asked.

"I wouldn't like her to get hurt if she was around when a hatchet-man broke in. She's another worm on the same hook and I'm not paying her for taking those risks."

"You're the one who's supposed to warn us of an attack," Norris pointed out. "Without you we're working blind."

"I know. But I'm not holding her hand twenty-four hours per day. Do you suppose it might be best to get rid of her for a while? How about me sending her on paid leave until this affair is over?"

"No. You can play your part only by sticking to normal routine. Make enough changes and a trap starts looking like a trap."

"They might jump her outside, hoping to use her to get at me. It wouldn't work, thank God. I'd know what was coming before it got here. Yet I'd hate to turn the guns on her because she'd ceased to be Moira any

more. What's done can't be undone. I'd like to prevent the doing in the first place."

"She must take her chances the same as everybody else," said Norris impassively. "It's no worse for one than for another."

"It is worse," Harper contradicted, "because one's more likely to be picked on than another. I'd be happier if she had a guard, day and night."

"She has. We tied a couple of men onto her at the start. Same applies to your other employees. We've covered all your regular contacts as well. If anyone tries the tactic of approaching you in familiar form, they're going to have a hard time finding one suitable and fancy free."

"I could find one any minute," Harper declared.

Norris jerked an eyebrow. "Somebody not under continual observation?"

"Yes."

"Then it's your duty to tell me."

"An agent," said Harper. "Any agent. Who is watching the watchers?"

"That problem is beyond solution. Our men are working in pairs already. We could group them in threes, fours, tens or twenties and find it not enough. The line has to be drawn somewhere between the desirable and the performable. They're operating in pairs and that makes it impossible for one man to be taken by himself."

"So they must be confiscated two at a time?"

"If that can be done."

"The enemy can do anything that human beings can do. For all I know to the contrary they can also do one or two things that we can't."

"We'll see about that," promised Norris.

The fourth successive day of ordinary, uneventful business routine found Harper bored with playing bait for fish that apparently had ceased to exist. His chosen role didn't seem such a bright idea after all. Perhaps he had based it on a grossly exaggerated sense of his own importance. Perhaps Venusian plans already had developed far enough to remove fear of premature detection. Perhaps they'd become sufficiently well established no longer to care a damn for Harper or any of his ilk.

Meanwhile he had become fed up with being followed wherever he went, finding G-men lounging at every street corner, occupying nearby tables in restaurants, standing beside him in comfort stations, breathing down his neck at the theater, mooching outside his bedroom night-times. The price of human liberty was to sacrifice his own.

Monotony was broken and faith in his purpose restored when he arrived at the office early, spread the morning paper across his desk and found a news item tucked away at bottom of a column inside.

Savannah, Ga. A brief but bloody gun-battle took place near here at midnight when F.B.I. agents raided the Rankovic farm. Two men were

killed, four taken into custody. Two more are believed to have escaped. Declining to reveal the purpose of the raid, Area Director Stephen Maddox states that the F.B.I. acted upon direct orders from Washington.

It was a most unusual report in several respects. For one, it had been played down. For another, the precise location was not stated and no names were mentioned other than that of Maddox. Lastly, this fight had occurred when all forces of law and order were engaged in one task and one only. Obviously, therefore, the incident had some bearing on the main issue.

This was confirmed ten minutes later when Jameson phoned long distance. "Seen the news?"

"I've just been reading it."

"It should have been on the dawn radiocast but we kept it off. We're having a heck of a time persuading news services to minimize such items. Naturally they want to know why and we can't tell them."

"What happened?" asked Harper, watching the other's face in the visiscreen.

"I can't say too much even on an officially cleared line. In brief, one of our men picked up Langley's trail, followed it to the Rankovic farm. Langley must have moved out during the short lapse of time between our man's report and the raid. Anyway, we didn't get him. The fox had bolted, leaving the hole still warm."

"More's the pity."

"Two are dead. Their bodies are being shipped out for examination." Jameson went on. "Of the four we captured three emphatically deny that they took any active part in the battle. They say they merely happened to be in the house when the shooting started and hid until things quieted down. We've given them the paraffin test and the result is negative."

"What about the fourth?"

"He's a brother of one of the casualties. Says he was in bed, woke up when the ruckus started. Pulled on his pants and ran downstairs, joined his brother and another guy in slinging slugs out the windows. He swears that none of them knew they were firing upon the law."

"Sounds plausible," commented Harper.

"He gave up when tear gas got him. By that time the other two were going cold. All four captives recognize Langley's picture, know nothing about him except that he'd been rooming there a couple of days and left at ten-forty or not much more than an hour before the place was raided."

"Almost seems as if he'd been tipped off."

"He couldn't possibly have been. He was just plain lucky. Anyhow, I've not called merely to tell you the story. There's more to it than that. When we made the raid we surrounded the place, knocked and demanded entry. Somebody fired back through the door. Therefore, although Langley wasn't present, it made little difference—the house still concealed someone anxious not to be

grabbed. What does that suggest to you?"

"Langley had made himself a pal," Harper commented.

"Yes, and he may have made himself more than one. Some fellow named Waggoner pulled out same time as Langley. We know nothing about him except that he and Langley are teamed up. We have a good description and, of course, the search is continuing for both."

"You learned nothing about the other two?" Harper asked.

"McDonald and Gould? No, not in that locality. They appear to have split up. They're trying to make it harder for us by keeping apart." He paused while the screen showed him to be consulting a document below the level of the distant scanner. "I want these four captives put to the test without delay. They may not be what they appear to be."

"Want me to come there?"

"No. It would spoil that set-up at your end. We're flying the four to you. Give them the penetrating eye and say whether they are or they aren't."

"I'll do that."

"Thanks a lot. There's something else, too. So far nobody has taken a bite at you. As you said yourself, it all depends on whether they knew the identity of that girl and whether or not the filling station murder was a coincidence. To date we have no evidence to show that they actually know they're being sought or that they know we have learned of the ship's return. So it's—"

"Has the ship been found yet?" interjected Harper.

"Not a sign of it. It couldn't have been destroyed beyond recognition; a professional breaking-up yard with gas-cutters and furnaces would take a month to get rid of that mass of metal. Latest theory is that it's concealed somewhere in sub-Arctic wastes or has been dumped in the ocean. The latter seems the more likely. In that case the crew must have got ashore by using their rubber raft. We're raking the coasts in effort to discover it."

"Well, it's an idea. What were you saying about nobody biting me?"

"I was pointing out that up to last night they may not have known for sure that the hunt is already in full cry. But the newspaper yap specifically mentioning the Rankovic farm could be a giveaway if Langley reads it. We tried to persuade the press to leave it alone or at least suppress the name of the farm. For our pains we got a bleat about freedom of speech and liberty of publication. There's now a fair chance that the fugitives are no longer basking in a sense of false security. They may look into the question of what ended it and belatedly trace the cause to you. You'd do well to be extra-wary from now on."

"I'll tell Norris," said Harper. "He's my nursemaid."

"There's no need to. If he isn't actually listening-in, he'll soon be informed by somebody who is listening. All your calls are being monitored."

"*Solely* as a measure of protection?" inquired Harper.

"Yes," said Jameson, without hesitation. He cut off. The visiscreen clouded, went blank.

"Liar!" Harper glowered at the wall. "They are more bothered about my big ears than my whole skin."

The suspected quartet arrived a few minutes before the office was due to close. Norris lined them up in the machine shop where they stood manacled together, staring around, openly puzzled by their presence in such a place as this. Half a dozen agents shared their company and watched them narrow-eyed.

Norris went into the office and said, "They're here. How about it?"

"No luck," Harper told him. "They are normal enough to be downright dull."

"O. K." He went out, came back. "I've had three of them taken away. Jameson wants your report on the remaining guy. He admits taking part in the shooting, claims that he didn't realize what he was doing. Is he telling the truth?"

Shoving aside the papers with which he'd been dealing, Harper appeared to lay back while he pondered the question. He listened, picked up a worry that nagged like a toothache but failed to provide an answer. So he probed, drove the mind in the other room away from its present anxiety and onto the recent cause.

"It's true enough. He got a scare that sent him into a panic."

"That's all we want to know."

Harper watched him depart, sighed deeply, slid the papers into a drawer and looked at his watch. It was time to call it a day.

At three o'clock the following afternoon the elusive foe put in first appearance. Harper was taking it easy just then, his chair tilted on its back legs, his feet on the rim of the desk, his mind wide open as idly he watched Moira sorting invoices.

His mental faculty had two distinct methods of functioning which he liked to symbolize as radio and radar. When he was playing at radio he merely listened and put up with whatever programs were being broadcast in the vicinity. If he switched to radar, he transmitted a pulse of his own which stimulated some other mind into producing a required response.

When he listened he took pot luck, accepted what was being offered whether informative or not, and ninety-nine times out of a hundred it was stuff not worthy of a moment's attention. But when he probed he got what he wanted by nudging the other mind into thinking of it. So far as ordinary human beings were concerned it made not the slightest difference which method he adopted because they were blissfully unconscious of both.

With a Venusian mind it wasn't the same; that had been his first lesson learned when he contacted the entity owning the Whittingham girl. In some subtle way the Venusian differed. He could listen to one, radio-fashion, without it realizing

that it was being overheard. But if, radar-like, he prodded one to compel release of a wanted datum, it felt the prod and took immediate alarm.

Telepathic power had its limitations. None knew that better than he did. Even with normal humans it became frequently necessary to conceal probing under a cloak of speech, to hold conversations spiced with leading questions that would stimulate desired responses. The alternative was to pick up a useless mess of stuff cerebrated at the others' whims.

To deal with a Venusian mind was not as easy. It became doubly difficult when squatting in the middle of an ambush. He could listen in the hope that the prey would betray its own coming, but had to be extremely careful about administering a mental jab. To probe too early might result in the other's escape with the news that one or more minds could detect things hidden from a million eyes. To probe too late might bring about a last minute struggle and the death of something they wanted to catch alive.

Right now he was slowly and rhythmically rocking the chair and straining its hind legs which gave forth protesting squeaks. Over the last few days he had not listened continuously. It was impossible to do that and give attention to other matters. Besides, there was no need to do so. It was sufficient for his mind to make a two-seconds sweep around the neighborhood every couple of minutes, much like a lighthouse beam circling across dark and stormy seas.

He rocked and made his umpteen hundredth or thousandth sweep, ceased punishing the chair, sat erect. Moira glanced at him expectantly, saw that his attention was not on her, resumed her sorting. He listened again to something far away, maybe a thousand yards or more, half-hidden in the general hubbub. It drew nearer, slowly but steadily, at a rate corresponding with walking pace. It was an inhuman mind gaggling like an angry gander.

"Norris!" he yelled.

Moira gave a jerk, dropped a bunch of papers, scrabbled for them on the floor.

The door whisked open and the agent looked in. "What's the matter?"

"I think this is it."

"You mean—?"

"It's coming on two feet. No car. On the sidewalk taking a stroll."

"Stay where you are!" ordered Norris. He bolted from sight.

Going to the window, Harper looked onto the street ten feet below. He opened the casement, leaned out to get a better view. That this made him an excellent target did not worry him in the least; there was no point in them coming after him except to learn his technique—and secrets cannot be extracted from the dead.

If there was one pedestrian in sight, there must have been a thousand. The mind he sought had to be

among that cluster on the left-hand side of the street between four and five hundred yards to the north. His directional sense assured him of that much but it could not detach one individual from a distant bunch of nondescripts.

Still leaning out and watching, he waited for the weird mind to draw closer. Three hundred yards, two hundred, one-fifty. By now he had narrowed the possibility down to three people; a smart housewife tripping along perkily; a plump and prosperous-looking businessman in his early forties; a lanky, lantern-jawed individual who slunk along close to the wall.

Behind him, Norris reappeared and said, "All set. Now can you—?"

Ignoring him, Harper made a vicious mental stab along the receiving-line. The result came back in a split second: intense shock, wild alarm, frantic desire to escape and bear warning elsewhere.

The housewife kept going without faltering or changing pace. The lanky slinker maintained gait and manner. The plump man stopped in his tracks, glared wildly around, swung on one heel and hurried back whence he had come. He moved at a rapid walk, about as fast as he could go without attracting unwelcome attention.

Harper jumped out the window. He heard a gasp from Norris, an exclamation from Moira before he landed heavily. His gun was already in his right fist as he regained balance and plunged forward in the wake of the escapee.

Something in the expressions of passers-by told the quarry that things had begun to happen behind him and now was the time to hustle. He did not bother to look backward for confirmation. Lifting arms to sides he broke into a headlong run. For one of his portly build he showed a remarkable turn of speed.

A bewildered clerk carrying a large box danced in front of the charging Harper who snarled, "Out of my way, Stupid!" then brushed him aside and pounded on. Back of him someone was shouting indistinguishable words in authoritative tones. On the corner six hundred yards ahead someone else blew a shrill whistle. A police car siren started wailing. Two agents stepped out of a doorway ahead of the fugitive, weapons in hands, and bawled an order to halt. Two more came racing down the opposite side of the road.

The plump man wasn't finished yet. Taking as little notice of the guns as one would of pea-shooters, he dived through the main door of an office building. Harper went in five seconds later, red-faced and breathing hard. Two agents followed close upon his heels. A car squealed into the curb, unloaded four more.

One of a bank of self-operated elevators was going up fast, taking the fugitive with it. Stopping at its folding gate, Harper scowled upward, watched the other's feet disappear from sight. One pair of

agents raced up nearby stairs. Two more jumped into an adjoining elevator and boosted it skyward.

Putting the muzzle of his weapon to the gate's lock, Harper fired, busted it, hauled the gate open and halted the elevator at third-floor level. He had hoped to get the quarry stuck between floors but the apparatus proved to be of automatic-leveling type and responded to sudden loss of power by letting its box sink into adjustment.

Listening to the minds above he detected the fugitive's break-out onto the third floor, the nearness to him of the agents on the stairs, and knew what was going to happen before he could prevent it.

He galloped up the stairs with sweat beading his brow. He had covered the first flight and half the second, taking steps three at a time, when overhead there sounded a terrific blast, a tinkle of falling glass, a brief pause followed by a hammering burst of explosions. His speed upped itself another twenty per cent while his lungs heaved.

While taking the turn from second to third he heard the yowl of an alien spark becoming extinguished in a useless body, also the wild, despairing cry of something more human on its way out. He slowed, mounting the remaining stairs at normal pace, sadly knowing that he was too late.

The third floor corridor was a shambles. Three agents stood in a little group looking over the scene. One was holding a heavy riot-gun

still warm in the muzzle. Another was mopping blood that dripped steadily from his left ear. The third was gazing gloomily at the body of a fourth sprawled near the top of the stairs, crimson splotches on chest and face.

Ten yards from the elevator lay the corpse of the plump man. He was not a pleasant sight. The riot-gun had tried to cut him in half and nearly succeeded. Glass from two broken doors and shattered ceiling lights lay in glittering shards along with flakes of paint and fragments of plaster. One or two scared faces began peeking furtively from doorways farther along.

VIII

The man with the dripping ear bent over the agent supine by the stairs, slid a hand under his vest, felt around and rasped, "He's dead." He stood up, patted a crimson-spotted handkerchief to the side of his head. "If he hadn't beaten me to the top, he mightn't have got it. And if I hadn't been four steps lower I'd have got it all over and right through."

"We soared past him in that other box," explained the one with the riot-gun to Harper. "When he stopped so suddenly we overshot him and had to back down. It was just then that he got out and tossed an egg at the other pair. A splinter went right through the floor and between my feet. We jerked open the gate, saw him running down there and gave him a burst before he could throw any more."

A horde came charging up the stairs, Norris and Rausch in the lead. Loud murmurings came from the street far below. Harper realized that he was still gripping his gun, tucked it away.

Norris glanced around, thinned his lips, examined the agent lying by the stairs. "He looks gone to me. Rush him down to the ambulance, just in case." He turned to the others. "What happened?"

They told him, finishing, "Fat lot of chance we had of taking him alive."

One of the onlookers opened a penknife, picked at the wall, dug out a ragged piece of metal. He studied it closely and said, "Army grenade by the looks of it." He gave the fragment to Norris. "What do you think?"

"Yes, you may be right. We'll have to start checking the armories. Frisk him and let's see what else he's got."

They made thorough search of the plump man's clothes. No more weapons, not even a vest-pocket gun. The grenade was all he had carried in the way of lethal objects. He had an expensive watch, a diamond stickpin and a well-filled wallet. His clothes were of top quality and his handmade shoes had cost him plenty. It was pretty obvious that instead of walking down the street he could well have afforded to come along in a private 'copter and dump himself on Harper's roof.

They laid him flat on his back, revealing a double-chinned and amiable face closely-shaven and well cared-for. Even now his features wore the expression of one who would not harm a fly—unless it tried to make off with the stickpin. His hands were clean and soft with pink, almond-shaped nails expertly manicured.

Apart from the watch, pin, wallet and two fine linen handkerchiefs he hadn't another thing in his pockets. That was singular: not a driving permit, business card or identity card; no pen, cigarette case, lighter or bunch of keys. His clothes were devoid of a tailor's label; his shoes bore no maker's mark other than that indicating the size. There wasn't a thing by means of which he could be identified quickly.

"More delay," remarked Norris, with bitterness. "It's going to use up valuable time finding out who he is." Again he pawed through the wallet and still found nothing but money of which there was a sizable wad. "We must nail him down before we can start the job of tracing all his contacts. He must have been in touch sometime and somewhere —otherwise he wouldn't have run off the rails." He became momentarily hopeful. "I don't suppose *you* can tell us anything about him?"

"Sorry," said Harper, genuinely regretful. It was beyond his power to dig data out of a dead brain. Although he had not had a chance to put it to the test he suspected that a probe might not have forced self-identification from the plump man's living brain. A Venusian involuntarily identifies himself as a Venusian and not as the entity he has usurped. That was the cause of all the trouble, the reason why one exceptional man could recognize them.

"We'll have to do the best we can and do it quickly, too." Norris handed the wallet to an agent. "Make a list of those numbers and have them circulated to the banks fifty miles around. See if anyone has them recorded as paid out and, if so, to whom."

Rausch had opened the watch and examined its insides. He snapped it shut, gave it to another of his men. "This ought to tell us something. It's one of those new-fangled jobs drawing power from variations in barometric pressure. There shouldn't be a million of them around considering what they cost. Find the local distributor. He'll have the movement number on his books and be able to say where it went. Follow it through until you learn who bought it."

The agent took the watch, hastened downstairs.

Studying the stickpin, Rausch said to Norris, "It's a poorer bet, but we'll have to take it." He beckoned another agent. "Show it to the leading jewelers. Phone us at once if you trace a sale."

"If his prints are on record, we'll know him in a few hours' time," commented Norris, inwardly doubting that they were recorded. "We'll roll a copy and let Washington have

a look. Let's hope they've got him on their files. Somebody had better tote those shoes around town. Any good shoeshop should be able to tell us who makes jobs like those."

"May I see them?" asked Harper. He took them, turned them over and over, doubled them toe to heel and felt their softness and pliability. He handed them back. "Made to measure for him."

Norris nodded, let go a yell of, "Where's the cameraman?"

That worthy appeared, his apparatus dangling from one shoulder. He glanced at the corpse with the professional air of one who had yet to see a stiff with a new shape, size, expression or attitude.

"Tidy his pan and make him look sweet," Norris ordered. "I want a good head and shoulders stereo-study to put through the pane. Some gawper might recognize him mooning out of the screen. Give me the pic just as soon as you can have it ready." He turned to Harper. "That's all we can do for the moment. We'll escort you back to your office."

Harper rubbed his chin, looked hesitant, said, "I'm so overawed by surrounding talent that I'm reluctant to offer a suggestion."

"Let's have it," urged Norris.

"You don't mind me amateuring right under your nose?"

"Of course not."

"Well, then," said Harper, "how many grown men go round without even a solitary key in their pockets?"

"That's right. He hasn't a key of any sort. I think he stripped himself of anything he thought likely to give us a lead but he made a sloppy job of it. Or maybe he knew that if anything happened to him it would be enough for him to cause a little delay."

"I also noticed that his right shoe is worn in the center of the sole," Harper went on. "More worn than is the left shoe." He paused thoughtfully, continued, "And he has the general appearance of a man who has enjoyed prosperity for many years. If he's ever been without a thick wad, it was a long, long time ago. Yet he *walked* down the street."

"What are you getting at?"

"Fatty has a car and uses it. His type almost invariably goes in for a big, powerful car the size of an ocean liner. But he didn't employ it this time. Why? Answer: for reasons best known to himself he parked it some place and did the rest on foot. But he did not leave it locked, otherwise he'd have the keys. Why didn't he lock it? Because somebody's sitting in it waiting for him, with the missing keys dangling from the instrument board. Is that someone still sitting and waiting? Answer: unless he has parked near enough to have seen or heard the ruckus, he'll be blissfully ignorant of it."

"Let's go down to the cruiser and put out a radio call. I have enough prowlers to rake the whole area and—"

"Now, now!" Harper chided.

"More space, less heed. There are hundreds of parked cars standing around and dozens have people sitting in them. Unless Fatty's playmate happens to be Langley, McDonald or Gould, how are you going to spot him?"

"He *may* be one of those three," said Norris, bursting to start the search. "Probably that's why this dead boy walked part of the way. None of those three would risk exhibiting himself near your place in case it was well-covered and he was recognized. He would have to squat out of sight and let a stooge do his dirty work."

"All right. Then I suggest you have all cars make a comb-out for Langley and company, paying special attention to parked jobs with waiting occupants. If the accomplice is not one of those three, then he's Mr. Anonymous and your men are out of luck. They wouldn't be able to tell him from Joe Soap even if he were cavorting down the main street in his naked pelt."

"But *you* could identify him?"

"Providing I manage to get near enough. You'd better take me on a personal tour of all the parking places within, say, half an hour's walk. Within two miles radius. Fatty wasn't running merely for exercise. He scooted in hope of losing himself a short while until he could make a fast getaway. Ten to one that means he had a car parked some place."

"I think you may be right," agreed Norris. "Let's go!"

They piled into one of the several cruisers now lined up outside the building. Norris took the wheel, Rausch sat by his side, Harper slumped in the back with another agent. About to start, Norris was struck with a thought, looked over his shoulder at the agent in rear.

"We don't know this area too well. You'd better get out and make room for a local cop who can show us around."

"I can direct you to all the likeliest places," said Harper. "Get going. Take the second turn on the right."

At once they moved off, made the turn, reached a park holding some two hundred cars. The machines stood in neat rows like a parade of hardback beetles. Seven had people sitting inside or lounging nearby. Harper made a mental dig at each, picked up no vicious reactions.

"Turn left," he ordered. "There are a couple of small dumps on that road and a big one about a mile up on our nearside."

They trundled along the road at moderate pace while examining all machines en route. Nothing was seen to arouse suspicion and no alarm was sprung.

A mile farther on they reached an underground hiding place holding more than a thousand cars. Rolling down one of the half dozen wide entrance ramps they entered a brightly lit cavern in which concrete pillars soared at intervals from a mass of silent vehicles. An attendant came toward them, his curiosity aroused by

sight of a police prowler. Norris dropped his window and stuck a head out to speak.

"Quick!" yelped Harper, sitting up and staring ahead. "There he goes—out the middle exit!"

Norris jumped the car forward, narrowly escaped knocking down the attendant. The car roared along the mainway between packed ranks of its fellows. Overhead lights flashed by faster and faster, receded into the rear distance. Supporting pillars zipped past with enough speed to make them resemble a paled fence. The car's bonnet lifted as they hit the exit ramp. The last light fled by, they shot into daylight and the street.

From the left Harper could still pick up the rapidly fading *gobble-gobble-gobble* of an agitated brain intent on escaping with what it had learned, namely, that gobblings can be heard.

The siren commenced wailing as they spun off the ramp and started down the middle of the broad street. Traffic scattered, fled to the sides and left a clear road far along which a big black car was hurtling as if driven by a maniac. Holding grimly to the wheel, Norris pressed the accelerator to the floorboard. Rausch felt around under a panel, took out a hand-mike, held it near to his mouth.

"Black Roadking escaping southward on Bailey Avenue. All cars in region of Bailey Avenue South, Greer Avenue South and Mason Turnpike intercept black Roadking."

"If this loaded heap catches a Roadking, it'll be a miracle," Harper observed.

They took no notice. The agent beside him leaned over, tugged a gun from a pocket, held it on his knees.

"Car Forty-one making for Bailey Avenue South," said an impassive cop, speaking out of the instrument board.

Harper squinted ahead, decided they'd lost a couple of hundred yards in less than a mile. He held on as they rocked around a halted bus.

"Car Eleven on Mason," announced another voice.

"Car Four on Mason at Perkins Corner," said a third.

The fleeing Roadking, now visibly diminished by its increased lead, made a sudden swerve as if about to dive up a sideroad, but at the last moment swerved back, cut the corner and continued down Bailey.

A moment later the reason became evident when a cruiser rocked out of the sideroad, set after it in hot pursuit. The newcomer was about halfway between Harper's car and the Roadking, made better pace because of its lesser load but still could not gain an inch on the excessively high-powered fugitive.

"What did I tell you?" griped Harper. "Fat men with fat wallets buy fat engines that guzzle a gallon of alk to the mile." He sniffed in disgust, added by way of comfort, "You can't bust his balloons either.

Those Roadkings run on sorbo-centered solids."

"Car Twenty-eight at junction of Mason and Bailey."

"That's the spot," gritted Norris. "They'll stop him."

"They'll have to crash him to stop him and it'll be a hell of a wallop by the way he's going," said Rausch, holding his mike to one side as he gazed anxiously ahead. "There's no safe way to halt him unless we follow until—"

Taking advantage of the other's preoccupation, Harper leaned forward and bawled into the conveniently held mike. "No half measures! Shoot to kill!"

"Hey, you!" Rausch snatched the mike away, turned his head to throw a scowl.

In that instant the listening Car Twenty-eight opened fire. The cruiser ahead of Harper's car promptly swung in to the curb, crawled cautiously forward and gave full view of the second cruiser parked half a mile farther along.

The Roadking whizzed hell for leather past Car Twenty-eight, covered a hundred and fifty yards, yawed wildly twice, made a violent turn that took it over the sidewalk and into a shopfront. The sound of the crash was like an explosion. Haberdashery sprayed outward. An inflated shirt tried to soar across the avenue on flapping arms. Two police officers scrambled out of Car Twenty-eight, raced toward the wreckage.

"That's done it," growled Norris, easing pressure on the pedal and reducing pace. He snapped over his shoulder at Harper, "Who's running this show?"

"I am. And if you didn't know it before you know it now."

"Our orders are—"

"To blue blazes with your orders," said Harper toughly. "I appreciate your coöperation and sometime or other you're going to appreciate mine."

He opened the door as the car stopped, got out, made for the Roadking knowing in advance that yet again an alien spark had become extinguished within a broken body. But at least no normal human being had been killed—that was one consolation.

In the rear of the shopfront a busted show-robot sprawled over the Roadking's bonnet and leered inanely at the dead driver. The robot wore a tartan hat tilted drunkenly over one eye and the force of the impact had filled its pants with broken parts. The driver sat bowed forward, his face rammed into the wheel, a pair of lurid socks complete with price-tag draped across his neck.

Two police officers waded through smashed glass, torn handkerchiefs and tattered pajamas, dragged at the car's door. They knocked display-stands out of the way the better to get at it.

Harper was about to join them when a slender individual pranced out of the shop, picked on him with much gesturing of white hands and

indignant fluttering of long eyelashes.

"Look at that!" shrilly insisted this apparition. "Just *look* at it! What am I going to do *now?*"

"I could make a suggestion," said Harper, surveying him. "But I don't care to be suggestive."

"This is too bad," insisted the other. "Simply too *too* bad. Somebody will have to pay for it. Somebody—"

"Sue the stiff in the car," Harper told him. "He did it. Don't blame us." Joining the police, he helped lug out the body.

The protestor shifted attention to Norris who was following close upon Harper's heels. "Only last night I dressed that window. It's really *sickening.* It makes me so mad I could *spit.* I don't know what—" He broke off and his large eyes went next size larger as they saw the corpse being carried past and laid on the sidewalk. "Why, Mr. Baum!"

"You know this porker?" demanded Norris swiftly.

"Yes, indeed. He's Mr. Baum. Mr. Philip Baum. Only last week I sold him a most fetching line in—"

Staring down at the plump and slightly familiar features, Harper interjected, "Has he a brother?"

"Yes," said the slender man, working his eyelashes and gazing fascinatedly at the dead face. "Mr. Ambrose Baum. A little older. Three or four years, perhaps. Isn't this *awful?* Mr. Baum! My window! Just *look* at it! It makes my stomach turn right over!"

"Where do the Baums live?" asked Norris.

"In Reevesboro. I'd—" He stopped, let his mouth hang open while he looked with horror at the shattered show-robot which slowly slid down from the bonnet and onto its knees, belched loudly, emitted a whirr and two clicks then went cross-eyed. He shuddered at the sight. "Alexander is ruined, completely *ruined.* I'd like to know who's going to compensate for all this."

"Pick on your insurance company," said Norris. "Where in Reevesboro is the Baum house?"

"Somewhere on Pinewalk Avenue, I believe. I can't recall the number. It should be in the phone book."

"Bring out your phone book and let's have a look at it."

"There's no need," put in one of the police officers, searching the body. He straightened up, holding a card. "He's carrying identification. It says he is Philip Kalman Baum of 408 Pinewalk Avenue, Reevesboro. The car is registered in name of Ambrose Baum of same address."

The other officer added, "This one is deader than a mackerel. His chest is shoved right in. The wheel did it."

Norris turned to the agent who had accompanied them from the beginning. "You take charge here. You know how to handle it. Tell the pressmen nothing. Let 'em yawp—and refer them to our field office." He beckoned to Harper. "We need you along."

Entering the cruiser the three

hustled away from the scene around which pedestrians had gathered in a murmuring semicircle.

"We may want more help than we've got," remarked Norris, driving at high speed. "You'd better cancel that Roadking call and see who's still on the turnpike. Tell them to follow us into Reevesboro."

Rausch found the mike, sent out the message and a voice came back saying, "Car Four on Mason Turnpike at Perkins Corner."

"Pick us up and tail us to Reevesboro," Rausch ordered.

They reached the big twelve-track artery, gained top pace. A green Thunderbug was running ahead of them. They overhauled it slowly, passed, moved ahead. The Thunderbug was being driven by a matronly blonde. Harper stared at her thoughtfully, picked his teeth and said nothing. He was tired of feeling around inside green Thunderbugs.

After four miles a prowl car shot off the verge and raced behind them. Another six miles and they sidetracked from the turnpike, ran into Reevesboro, found the address they were seeking. It was a small but attractive house standing in a half-acre plot.

Driving a short distance past, Norris stopped, signaled the following car to close up behind. He got out, went to the other car in which were two police and two agents.

He said to the police, "You fellows stay here in case some escapee takes a fancy to an official auto." Then to the agents, "You two get around to the back of that house. If anyone beats it that way as we go in through the front, he's your meat."

"You're wasting time," advised Harper, near enough to the house to know that nothing alien lurked within.

"I'm the judge of that," Norris retorted. He waited for the two agents to make their way round the back, then started toward the front door. "Come on!"

A gray-haired, motherly woman answered the bell. She was in her late fifties or early sixties, had toil-worn hands and meek features.

"This is the Baum house," said Norris, making it a statement rather than a question.

"That's right," she agreed. "But Mr. Philip and Mr. Ambrose aren't here just now. I don't know when they'll be back."

"They'll never be back," Norris told her.

Her wrinkled hand went to her mouth while she gazed at him in thoroughly startled manner. "Has . . . something happened?"

"Unfortunately, yes. Are you a relative?"

"I'm Mrs. Clague, their housekeeper," she informed a little dazedly. "Are they—?"

"Any relatives living here?" interrupted Norris.

"Oh, no. They're confirmed bachelors and have nobody related to them living nearby. In this house there's only the maid and myself."

She swallowed hard. "Are they hurt?"

"They're dead. We're law officers. We'd like to have a look around."

"Dead?" She whispered it as she stepped backward and let Norris enter with Harper and Rausch following. Her mind had some difficulty in grasping the full import of the news. "Not *both* of them surely?"

"Both, Mrs. Clague. I'm sorry." Norris extracted three photographs from his wallet, showed them to her. "Do you recognize any of these men?"

She blew her nose, wiped her eyes, studied the pictures bemusedly. "No, I don't."

"Sure you haven't seen any of them recently?"

"I'm positive."

"Where's this maid you mentioned?"

"In the kitchen. Do you wish to speak with her?"

"Yes."

She called, "Winnie! Winnie!"

Winnie slouched in, a plump, ungainly girl with the placid eyes of a ruminating cow.

"Know these?" demanded Norris.

She ogled the photographs. "No, sir."

"If any of them had visited recently would you or Mrs. Clague have been sure to have seen them?"

"I guess so."

The housekeeper put in, "Mr. Ambrose and Mr. Philip seldom had visitors. They used this house only for relaxation and sleep. And they kept late hours. Two or three o'clock in the morning they'd come home sometimes. But always sober, I'll say that for them. I—"

"What did they do for a living?" Norris asked.

"They have three jewelery shops somewhere or other. And a small wholesale warehouse in town. Their father started the business, I believe. He's been gone a good many years. They were two nice gentlemen and it's terrible to think they're—"

Norris cut the garrulity with an impatient gesture. "We want to look over any papers they've left lying around. Where did they keep their correspondence?"

"All their business files will be at the office," said Mrs. Clague. "But their personal letters will be in that desk or perhaps upstairs in their rooms."

"All right, Mrs. Clague. We're sorry to trouble you but these things happen. If you're not too busy, how about fixing some coffee?"

Still somewhat bewildered, she agreed, retreated to the kitchen as if glad to escape their questions. Winnie slopped along behind her, turned twice to look back with a bovine smile before she, too, disappeared. Norris frowned after her.

"What was that one smirking at?" he asked.

"You," Harper informed. "She's about I.Q. 70 but that doesn't spoil her appetite for a tasty hunk of man. It's what comes of being a handsome Fed."

"Nuts!" growled Norris, looking sour. He spoke to Rausch. "We've no time for search-warrant formalities and by the looks of it there's nobody around to bawl about the matter. I'll rake through this desk. You give the bedrooms a going-over. When we've finished we'll run into town and frisk the office. We must compile a complete list of all the contacts they've made these last few weeks."

Rausch tramped upstairs. Norris spent five minutes trying to open the desk, failed, called in one of the two agents stationed at back.

"Open this lock for me, Yensen."

Examining it, Yensen went out to the garage, returned with a length of wire. "Another Roadking is stashed in there. Same model and one number higher. They must have bought them together." He fiddled with the wire, turned the lock, rolled up the lid which automatically released the drawers.

Avidly Norris pounced on the contents, pulling documents from pigeonholes, scanning them rapidly, putting them aside. He lugged out the drawers one by one, found a dull black gun concealed in a camera carton, handed it to Yensen.

"Hang onto that. The ballistics boys may be able to dig some data out of it."

After a while he finished reading the last of a bunch of letters, shoved them back, grunted discontentedly. "Go ask Mrs. Clague when the Baums were last here."

Yensen departed, came back. "She says they had breakfast this morning."

"That's peculiar." He turned to Harper. "All this stuff is chitchat, mostly from friends in the trade. It averages a letter a day. But there's nothing filed for the last five days. If the average was maintained, there are five letters missing."

"They may be at the office," Harper suggested. "Or—"

"Or what?"

"Maybe they destroyed them on receipt."

"Why should they do that?"

"Because the messages were devoid of interest, they having become alien to the readers."

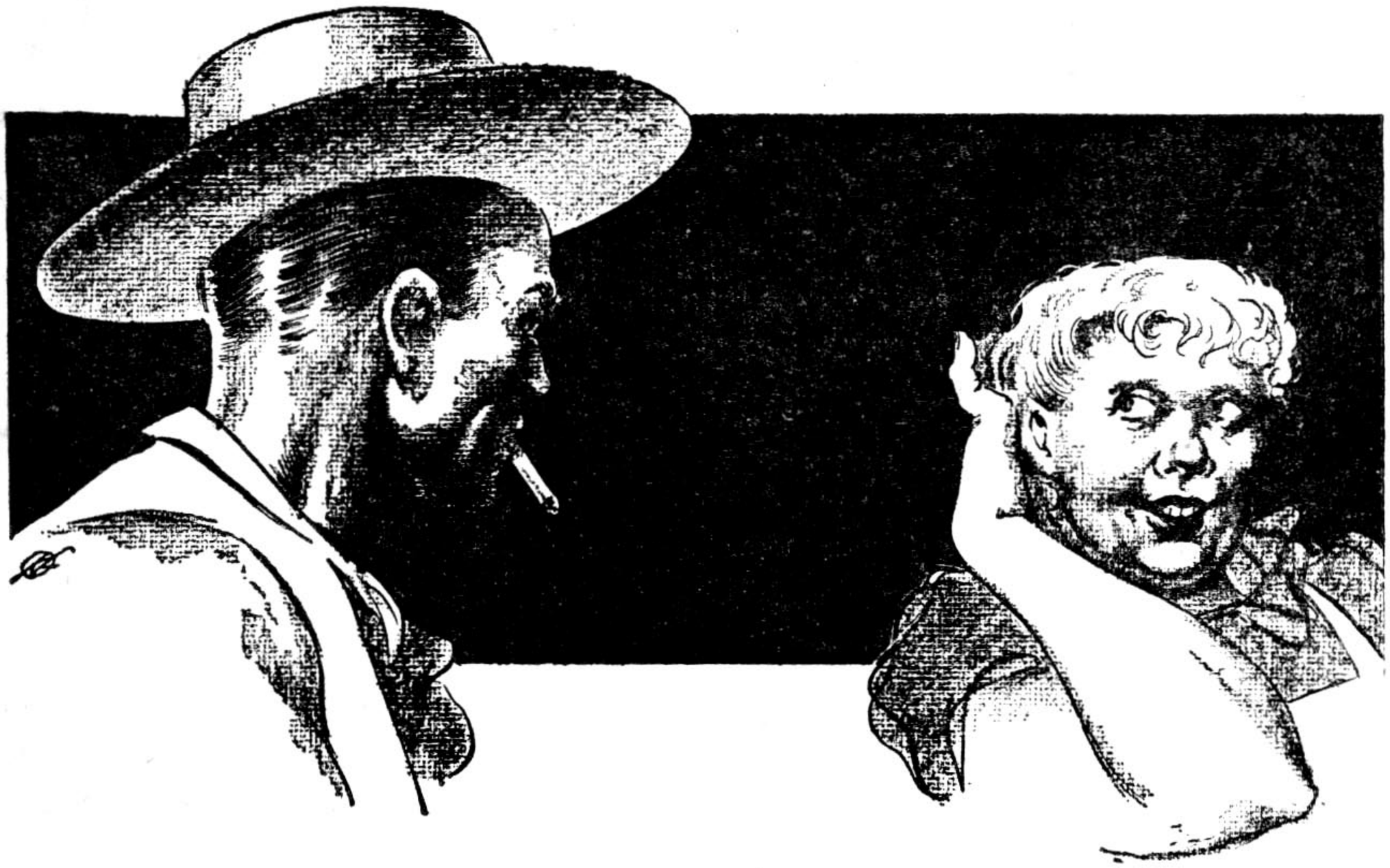
"We'll check at their office before we jump to any conclusions," Norris decided. "Either they kept them or they didn't."

"If a search elsewhere fails to produce them, we can bet on two things," said Harper. "Firstly, that the Baums were taken over about five days ago. Secondly, that the enemy is no longer so desperate to get established in number and is starting to be choosy."

"How d'you make that out?"

"The Baums have been in daily contact with Mrs. Clague and Winnie. We know that much. But neither of the women were touched. They've been left alone despite that they're easy prey. They've lived with the devil but retained their souls. Aren't they the luckiest people?"

"You give me the creeps," Norris complained. He turned to Yensen. "Make a list of names and addresses



from this correspondence and bring it to H.Q. We'll have to follow up every one of them."

Rausch reappeared saying, "Nothing of any significance up there except a couple of telephone numbers scribbled on a pad by the phone in Ambrose's room."

"We'll look into those later." Norris had a final, dissatisfied glance around, saw nothing of fresh interest. "If the fate of the Baums isn't yet known to those we're seeking, you can see what's likely to happen. Somebody's going to come along wanting to know how the brothers made out. If all of us go to their office, there will be nobody here to make a grab. We'll have to stake this place until the news gets out and warns off possible visitors."

"I'll stay with Yensen," Rausch volunteered. "If anybody—"

Something went *whirr-whirr* above.

"The phone!" yelped Norris.

He charged upstairs, taking two steps at a time. The others crowded behind him. Entering Ambrose's room he eyed its bedside phone warily.

"Notice any other telephone here?"

They shook their heads.

"Too bad. No chance of holding the caller while we trace him." Extracting his pocket handkerchief he draped it over the tiny scanner then lifted the earpiece. The small visi-screen at once lit up but revealed no picture. That meant a similarly obscured scanner at the other end. "Hello!" he said.

"Var silvin, Wend?" demanded a voice bearing the sharpness of deep suspicion.

"Baum residence," said Norris, frowning. "Can I help you?"

Click! The line went dead. Norris rattled the instrument, raised the operator, identified himself. "Where did that call originate? Let me know quickly—it's urgent!" He hung on for most of a minute, listened again, snorted, racked the phone and told the others, "The Baum warehouse. Evidently they had a rendezvous there with somebody who got worried and called after they'd failed to turn up. We missed a trick by not finding out about the place and going there first."

"Get along right now," urged Rausch. "I'll stay with Yensen, just in case."

Norris nodded, signed to Harper and they hastened to the car. Ordering one of the waiting police to join them, he drove away at top pace.

"You might as well take it easy," advised Harper, with unconcealed pessimism. "There'll be nobody at the place. Whoever hangs up on a call isn't going to sit around doing nothing."

"That's what I think," agreed Norris, maintaining speed. "But if we fail to catch somebody it won't be for lack of trying." He used a hand to indicate the microphone under the dashboard. "Put out a shout. Any cars near the warehouse to go there at once. Detain anyone found on the premises."

Harper did as told. Two voices answered, said they'd be there within a couple of minutes.

"A couple of minutes too late," he commented, replacing the mike.

IX

The warehouse proved to be an ancient but solid redbrick building with six heavily barred and shuttered windows and a cumbersome steel door. It had the appearance of property once designed to hold merchandise regarded as a chronic temptation to the backward neighborhood. Two cars were lined up outside and three police were standing defeatedly nearby.

"We've three men waiting around the back," one of them told Norris. "The place is locked. Nobody answers the bell. No sounds inside. Looks like it's empty."

"Then we'll break through the door."

It took some time to do that but they managed without overmuch damage. Not a soul lurked within. The first floor held a number of flat glass showcases exhibiting junk jewelry arrayed on black velvet. The floor above was littered with light crates and cardboard cartons, some full, some empty. A small office of clapboard and plastiglass stood in a corner.

Entering the office, Norris moved carefully around, said to one of the police, "Fetch the fingerprint man. Given enough luck we may be able to discover who was waiting here." To Harper he added, "It takes a

professional criminal to wipe a place clean of prints—and the characters we're after don't fall into that category."

He went to the desk, slid out its drawers. The contents were not enlightening, mostly billheads, invoices and other business items. A metal filing cabinet proved no more informative.

"Tell you one thing," remarked Harper, sniffing the air. "The Baums and their associates seem fond of cold-cure."

"What makes you say that?" asked Norris.

"Ambrose had a faint odor. So did Philip. And I can smell it again here."

Norris twitched his nostrils a couple of times. "Your sense of smell must be a deal sharper than mine."

"People vary that way. So do dogs. I can detect it all right. And I know what it is."

"What is it?"

"Eucalyptus."

"Well, that's mighty useful," commented Norris sardonically. "Now all we need do is track down somebody stinking of eucalyptus."

"You could do worse," Harper opined. "Three smellers in a row, and in one day, means something. Like tobacco. If I'm in a deep forest and smell burning tobacco, I know a man is somewhere near."

"So—?"

"Maybe somebody *likes* eucalyptus."

"You come up with the damnedest ideas," said Norris.

"They've got to come up from somewhere if we're going to make any progress at all." Harper shoved hands deep in pockets, gazed moodily around. "Anyway, why shouldn't certain people have a craving for the stuff? Koala bears dote on it, so I'm told."

"They eat the leaves," Norris informed. "Besides, we're not trying to cope with koala bears. We're in pursuit of things with bigger teeth and claws."

"So what? Even tigers have fads."

Norris frowned at him, reached for the telephone, handling it delicately so as not to spoil any latent prints. He dialed a number and spoke to someone.

"This is no more than a wild guess but you'd better note it: check all suspects for an odor of eucalyptus." He racked the instrument, admitted, "It would sound silly to me if this entire business wasn't so crazy."

"Not being a full-time Sherlock," said Harper, "I tend to miss things that are obvious to you but spot others that you may overlook. For instance, what's the scientific conclusion to be drawn from a liking for eucalyptus?"

"I don't know."

"That elsewhere the natural prey is vegetarian and feeds on aromatic shrubs, its favorite food being something akin to eucalyptus. So here the host feels a need born of centuries of conditioning. In other words, they've found a local drug

that reminds them of home, sweet home."

"What are you talking about?"

"Sorry, I forgot you've been told only part of the story," said Harper. "You've got to know the whole of it to guess the way I'm guessing."

"Eucalyptus isn't a drug," declared Norris, baffled.

"Not to us, it isn't. God knows what it is to some other guppies."

"Look, did you sniff the stuff when you shot that girl?"

"No, I didn't go near enough or hang around long enough. Her case being the first, I was in a jam, had to get out fast, had no time or inclination to look for what I suspect only now."

"Humph!" Norris thought a bit, resorted to the phone again, called the Baum house, spoke to Rausch. "We're out of luck. The bird had flown." He listened to some comment from the other end, then continued, "Harper smells eucalyptus here, says the Baums smelled of it, too. I didn't notice it. Did you?"

Rausch said, "Yes. But I thought nothing of it."

Cutting off, Norris observed, "I should have my nasal passages irrigated."

"This is important," Harper pointed out. "Ambrose and Philip carried the odor. Whoever was here reeked of it. Maybe they stumbled across the stuff with the same glee as a bunch of hopheads discovering a field of Mexican hemp. If so, they'll pass the news one to another."

"Well?"

"The habit will hand humanity a small advantage. If you can't tell what's going on in a suspect's mind, you can at least smell his breath. He thought again, added, "By 'you' I mean the forces of law and order in general. *You* couldn't smell an overheated goat under your own bed."

"Thanks for the criticism," grunted Norris. He lapsed into silence as the fingerprint man arrived and set about his business. The newcomer raised prints all over the place, most of them undoubtedly being those of the Baum brothers. When he had finished, Norris ordered, "Get them checked as quickly as possible and let me know the results." He turned to Harper. "Momentarily we're stalled. Let's get back to your office."

"And put the worm on the hook once more, eh?"

Norris glanced at his wrist watch. "I don't think so. It's a bit too late to expect further action there. You'll be just in time to lock up and go home. If anyone else comes after your blood before tomorrow, it's likeliest to be while you're in bed."

"That idea makes for peaceful sleep."

"Don't worry. You're well guarded around the clock."

"I know. Too well for my liking. By the looks of it I'm going to have official company for the rest of my natural life."

"Oh, I wouldn't say that," opined Norris. "This rigmarole is only for the duration of the emergency."

"So it is alleged," Harper grumbled. "But higher up are a few authoritative coots who resent the unalterable facts of life. They're not above replacing one emergency with another so long as it suits their power-game to do so."

He got into the car, sat alongside Norris and returned to the office in silence. He was grouchily aware that when the present crisis ended—if ever it were ended—he would then have the problem of how to get authority off his neck and for keeps.

It wasn't going to be easy.

Morning brought news. Norris poked a head into the office, beckoned him away from Moira's hearing.

"Things are beginning to break," he announced. "Firstly, there were two calls to the Baum house during the night. The caller hung up immediately Rausch answered. Both calls emanated from public booths. That means the Baums' contact man is still in town some place."

"Assuming there's only one of them," said Harper. "For all we know, there may be a dozen."

"Perhaps. Anyway, we got identifiable prints out of that warehouse office. They are McDonald's."

"Ah! So *he* was waiting there?"

Norris nodded. "We missed him by minutes. Further, we've found that he was with the Baums in an hotel one evening. He left with them in Ambrose's car and hasn't been seen since. Two waiters and a barkeep have identified his picture."

"When did he pick them up?" Harper asked.

"Six days ago."

"Just the time we estimated," Harper remarked.

"We're searching the locality for him right now," Norris continued. "If he's still here today, we'll find him."

"That may prove more difficult than you expect."

"Why?"

"He doesn't have to stay at an hotel or rooming house. So you'll gain little making the rounds of those. He doesn't have to rent a flat. He doesn't have to sleep out in the open."

"Then what does he do?"

"He lives in a private house, as one of the family—having *made* himself one of the family." Harper eyed him skeptically. "How are you going to search several thousand private homes?"

"We won't try. There are quicker ways of picking up leads."

"How?"

"Every street has its gossip, its incurable snoop. We have enough photos of McDonald to check with every nosey-parker for miles around. What's more, he can't operate while sitting in a back room behind drawn curtains. He has to emerge sometime. If it was he who called Rausch he went outside his hole-up to do it. He took a risk and was mighty lucky not to be recognized."

"How about sounding the drugstores for abnormal sales of eucalyptus?"

"We've thought of that. Four agents are on the job."

The phone shrilled in the office. Moira picked it up, called to them, "It's for Mr. Norris or Mr. Rausch."

Norris went inside, listened for a while, came back and said to Harper, "That was Jameson."

"Anything new?"

"Yes. Langley's dead."

"So they caught up with him?"

"He was spotted in a stolen car at dawn. Two men were with him, Waggoner and a fellow now known to be a certain Joe Scaife. They ran up against a road-block, abandoned the car and took to the woods. Police, agents and national guardsmen dived in after them. Jameson says they put up such a desperate fight it proved impossible to take them alive. Langley and Scaife were shot dead. Waggoner used his last bullet on himself. That was about an hour ago. Their big problem now is what to tell the newshawks."

"This looks bad to me," Harper admitted.

"Bad isn't the word for it," said Norris, seriously. "Waggoner's deed speaks for itself. If these reactions are any criterion, we're up against a crazy crowd who'd far rather be killed than caught."

"The Baums behaved the same way," Harper reminded. "The death-before-dishonor touch."

"It's inhuman."

"Of course it is! Get it into your head that we are fighting against mentalities with standards far different from yours and mine. To them, capture may seem a fate considerably worse than death. If so, it wouldn't be enough for us to try win a battle. More is needed. We must also prevent a last-minute suicide to get one of them alive."

"Our orders are to take them alive at all costs."

"Easier said than done."

"Well, you're supposed to be an ace in the pack," Norris pointed out. "How would you go about it if you happened to find one of them, McDonald for instance?"

Harper mulled the problem, then said, "The all-important thing would be not to let him realize or suspect that he'd been tagged. I don't see anything else for it but to sit around in patience and wait a chance to knock him unconscious or pin him down before he could make a move of any kind."

"That comes well from the man who got Ambrose Baum on the run."

"I had to make him react to find out who was which. Up to that point there was no telling with such a crowd in the street. We knew nothing about him until then. McDonald's different. We do know what he looks like."

"True enough."

"If it comes to that," Harper went on, "and I could organize things my own way—which unfortunately I can't—I would not try to take McDonald alive or dead. I'd let him run free."

"Why?"

"So that he could lead me to others."

"He wouldn't play sucker for long," Norris scoffed. "If you think you could exploit him for months, you're mistaken."

"For what reason?"

"Because it's no darned use him leading you to others unless you profit by it. Therefore you'd have to grab them sooner or later. And directly his contacts start disappearing he'll take alarm, scoot out of sight or blow his head off." Sniffing his disdain of amateur tactics, he finished, "If we can capture him unscratched and intact, he'll do all the leading we require and whether he likes it or not. We'll see to that!"

"Have it your own way." Harper returned to his office, saying, "I'm going to carry on with business otherwise it will never get done." He squatted behind his desk, spent half an hour considering a large blueprint, then gave ten minutes to the long letter that had come with it. "All right, Moira, wet your pencil and be careful with the big words. I—"

Norris looked in and commanded, "Put your hat on. You're wanted again."

"Oh, not now, surely?" growled Harper. "I've important work to do."

"You bet you have," agreed Norris. "But you can't do it there. Come along."

Throwing him an ugly look, Harper said to Moira, "Much more of this and you can have the business as a gift, you being about the only one left to cope with it unchivvied."

"Hurry up!" urged Norris. "Never mind the gripes."

Harper did as bidden, went out, followed him down to the car, clambered in.

"They think they know where McDonald has hidden himself," Norris explained.

After a brief run the car halted at one end of a long, tree-lined road sided by tidy bungalows. No other official cruisers were in sight as Norris pointed through the windshield and spoke.

"It's a pink-washed house halfway down on the left. The boys are keeping clear of it so as not to raise an alarm. We'll roll casually past. Take a look as we go by and tell me what you think."

He shifted into gear and let the car move forward at modest pace. They trundled by the pink house which had a close-clipped lawn in front, a locked garage at one side. Nobody could be seen about the place, nobody maintaining a lookout from a window. Reaching the end of the road, Norris parked by the curb.

"What's the verdict?"

"Nothing doing."

Norris registered acute disappointment. "Are you sure of that?"

"We'll circle around and try again if you're not satisfied."

They circled.

"Nothing doing," repeated Harper. "For all I can tell the house is empty." He glanced at the other.

"How did you get a line on this address?"

"One of our agents went the rounds of the taxi companies on the theory that if it was McDonald who made those calls to the Baum house he did not walk to or from the booths. The agent found a driver who recognized McDonald's picture, claimed to have picked him up after midnight and run him to this place."

"After which McDonald walked around the corner and made for wherever his sanctuary really is," Harper suggested.

"The driver saw him use a key and go in. That's likely enough. After all, McDonald isn't a hardened crook, wise in the ways of the underworld. He could be naive enough not to think of a taxi-trace."

"That's so. Anyway, all I can tell you is that he isn't there at this moment. Maybe he's in my office making preparations for my return. Moira wouldn't like that. Let's go back."

"Bide your time," Norris ordered. "Your correspondence can wait. It'll have to wait. It'll wait a hell of a while when you're dead, won't it?"

"I'll worry none at that stage. I don't have to eat when down the hole."

Taking no notice, Norris pondered a moment, decided, "I'll take a chance on setting off the alarm." Turning the car round, he drove to the house standing next to the pink one. A middle-aged woman was at the door watching him. He beckoned to her and she crossed her lawn, examined him with beady-eyed curiosity. "Can you tell me who lives next door?" he asked, pointing.

"Mr. and Mrs. Reed," she informed.

"Nobody else?"

"No. They have no family. They're not the kind who would, I reckon." She thought again, added, "They've a nephew staying with them just now. He's from some place out west, so I've heard."

"Would this be the nephew?" inquired Norris, showing her McDonald's photograph.

"Yes. Only he looks a bit older than that."

Norris took in a deep breath. "How long has he been rooming there?"

"About a week." She reconsidered, went on, "Yes, I first saw him last Thursday." Her sharp eyes studied his plain clothes, had a look at the car. Her mind showed her to be impressed by Norris' official tone. "Are you police?"

"If we were, we'd have said so," Norris evaded. "We just want to make sure of the Reed's address."

"That's their house all right," she confirmed. "But you won't find anyone in. They took their car out this morning and haven't come back."

"About what time did they leave?"

"Eight o'clock. And they were in a real hurry, I can tell you that."

"Don't happen to know where they've gone, do you?" put in Norris, with a faint hope.

"Oh, no. They said nothing to

me and I didn't ask. I mind my own affairs and leave other people to mind theirs."

"Quite proper of you," said Norris. "I suppose there's nothing for it but to come back later when they're in."

"Heaven knows when that will be," she volunteered. "They took a lot of luggage with them. It gave me the idea that they were going for quite a piece. Not that it's any business of mine, of course. But sometimes one just can't help noticing things."

Norris considered this evidence of her ability to mind her own affairs, then asked, "Have they any friends locally who might put us in touch with them?"

"Not that I know of," she answered. "Those Reeds aren't overly sociable and became even less so after that nephew arrived. In fact if you ask me, they've been downright surly these last few days. Wouldn't speak unless spoken to and then said no more than they could help. Acted as if I were a complete stranger to them, me who's lived next door for twelve years. It made me wonder what on earth had come over them. That nephew had something to do with it, I'm sure."

Harper put in, "Who told you that he was their nephew?"

"Mrs. Reed," she informed. "I said to her, 'Who's the young man?' and she gave me a sharp look and snapped, 'Just a nephew.' You'd have thought I'd asked her for the loan of a hundred dollars from the way she spoke. Naturally I didn't mention him again. I know when to keep my mouth shut."

"Thanks for the information," said Norris. He got the car going while she remained on the lawn and showed deep disappointment at giving so much and learning so little.

"If that female minds her own business," remarked Harper as they rounded the end corner, "how much might we get out of someone who doesn't?"

Norris grunted and offered no comment.

"What do you propose to do about McDonald?" Harper pursued. "Are you going to stake this place as thoroughly as you've staked mine?"

"It has been watched continually since nine o'clock but evidently we started an hour too late. And although you saw no sign of the fact, it's still under observation." He weaved the car through traffic, went on, "First thing is to get the tag-number of the Reed car from the motor vehicle bureau and put out a general call for it. The second step is to have that house searched on some pretext or other. The third is to find how and where McDonald picked up the Reeds and, more importantly, whether he's had contact with anyone else beside the Reeds and the Baums. Lastly, I want to know how he's managed to smuggle himself out of this area seeing that all routes are sealed."

"Maybe he isn't out of the area.

Maybe he is hidden somewhere nearby."

"We'll soon learn." He drove another mile, asked, "Well, what are you thinking about?"

"Langley's dead. McDonald's not too far away and now being sought."

"What of it?"

"Strange that there's not been a whisper about the third fellow, Gould."

"No, there hasn't," Norris admitted. "He appears to have vanished into thin air. That proves nothing except that luck runs better with some than with others."

"If it is luck."

"What do you mean?"

"It doesn't have to be luck. Perhaps he is the cleverest of the three, a really crafty character. If so, he is also the most dangerous."

"He'll fall over his own feet eventually," Norris assured. "They always do."

"I've been the subject of a nationwide hunt myself," Harper pointed out. "Admittedly it wasn't so urgent and intensive. But I had to jump around plenty to stay free. I know what it means to be on the run, which is more than you do, always having been the chaser and never the chased. The man who can disappear like Gould is good. He's too good for comfort."

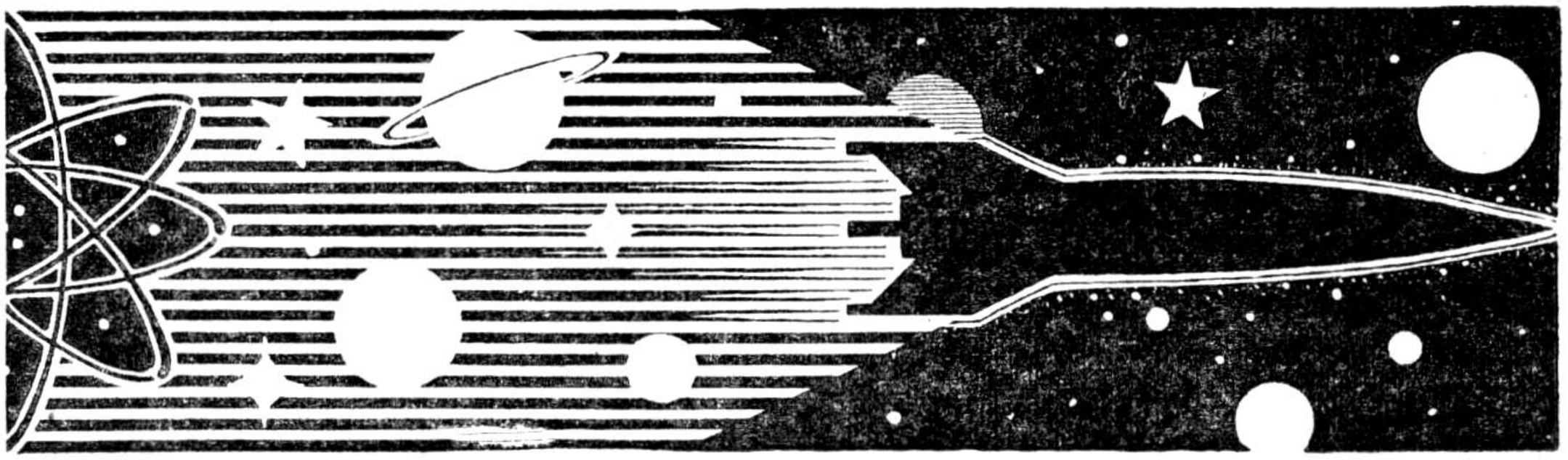
"That won't save him forever," Norris observed.

"We haven't got forever. Time is running short. Every day, every hour counts against us." He shoved open the door as they halted at their destination. "You know only as much as they've seen fit to tell you. I'll tell you something more."

"What's that?"

"If progress proves too slow for success, if we're compelled to face defeat, you'll have another bird's egg in your mental nest before the new year. You'll be really cuckoo in a new and novel sense of the term. Just like everyone else. At least you'll be in the fashion—when it's the latest thing to be one of the walking dead!"

TO BE CONCLUDED



VICTORY ON PAPER

BY ISAAC ASIMOV

In his recent "Hemoglobin and the Universe," Asimov showed that you couldn't add up enough units in a billion Universes to equal the number of possible formations of a single type of common molecule. True enough—but division is a far more powerful tool than addition or subtraction. And division on paper can do it!

The fact of the matter is that Russians do make important discoveries now and then. As a case in point, let us consider a Russian who suffered under the burden of the name, Michael Tsweet. (However uneuphonious Tswett sounds in English, it means "light" in Russian.)

In 1906, Tswett submitted a paper to a German botanical journal in which he described a series of experiments involving a new and, as it turned out, revolutionary technique. Tswett was a botanist who was interested in the colored pigments one could soak out of plant leaves by using various solvents. Among those pigments is chlorophyll which plants use to convert solar energy into food and without which life on Earth—except for certain microorganisms—would quickly become impossible. Naturally, biochemists were yearning at the time to get at those plant pigments, separate one from another and figure out the structure of each. But how was one to go about separating the unholy mess of goo into individual components? Ordinary chemical procedures simply didn't come close to doing the job.

The way Tswett went about it was to dissolve said mess in a liquid called petroleum ether and then pour it through a glass column packed tightly with powdered limestone. The liquid percolated downward and came out at the bottom of the column unchanged and unharmed. The plant pigments which had been dissolved in the liquid, however, remained behind, clinging to the surface of the limestone particles.

Don't think for a moment that the pigment molecules were faced with an easy choice. To be sure they preferred the particle surface, yet the liquid did exert a certain attraction for them. As the liquid passed through the pigment molecules were slowly and reluctantly dragged down with it, moving downward from limestone particle to limestone particle.

Each individual type of pigment was its own schizophrenic self; each arrived at its own particular compromise in deciding how firmly to remain with the limestone or how willingly accompany the downward-moving liquid. The more tightly they hugged the particles, the more slowly that particular variety of molecule moved downward. The more bibulously they enjoyed their liquid surrounding, the more quickly.

What was, therefore, originally a disheartening mixture slowly resolved itself into a series of bands of different shades of yellow and green in different places along the column of powdered limestone (see figure 1). If one continued to pour petroleum ether through the column, each band would eventually be washed out through the bottom opening—one at a time. By the time the experiment was completed, the different components of the mixture would be resting contentedly in separate beakers.

Tswett called the technique "chromatography" from Greek words meaning "color-writing," though as he pointed out, the principle would work for colorless mixtures as well.

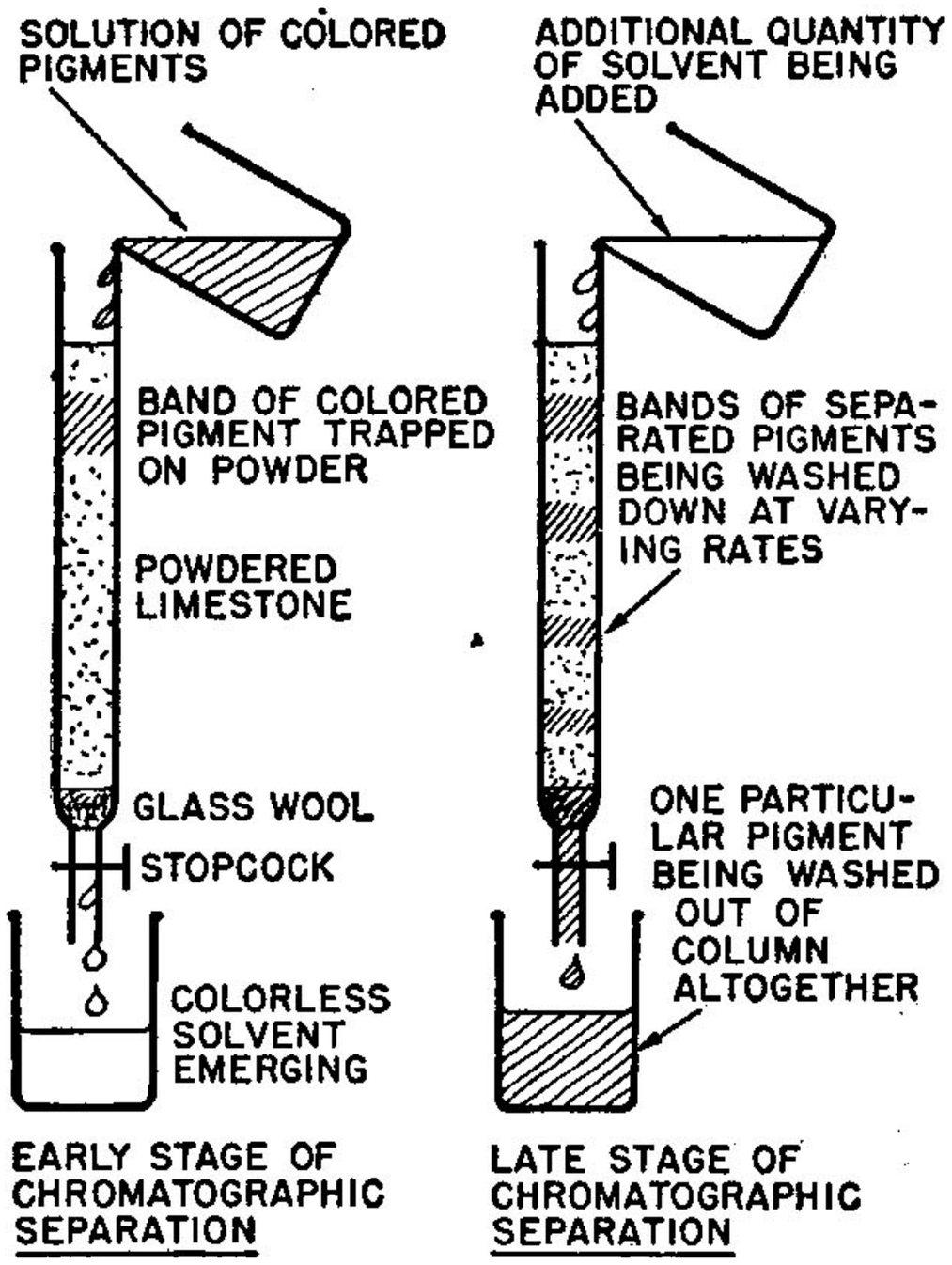


Figure 1: Column chromatograph.

Tswett, unfortunately, was in a poor position. Biochemistry was, at the time, almost the private domain of German scientists and these did not take kindly to the fact that here was a neat, elegant and easy solution to a mystifying and tantalizing problem offered the world by 1) a botanist and not a biochemist, and 2) a Russian and not a German. Furthermore, in 1910, when Tswett wrote a detailed monograph on chromatography, he wrote in the very best Russian and he might as well have used south-Martian for all the good that did the biochemical world.

Working in favor of Tswett was only the fact that he was right and

that chromatography was destined to become one of the most powerful and widely-used techniques available to the biochemist. The mere fact of his being right, however, was not enough to raise a Russian botanist to a level of equality with a German biochemist, and chromatography dropped dead. (In 1922, an American used chromatography and reported it, but in those days that carried little weight, too.)

Twenty-five years passed from the day of the original discovery. Then, in 1931, German biochemists finally got around to using Tswett's techniques and, what do you know, it worked exactly as he had described.

In the last quarter-century, all sorts of powders have been used to separate individual components out of all sorts of mixtures. Most recently, synthetic substances known as "ion-exchange resins" have been most useful.

In 1944, came a major refinement. A group of English biochemists abandoned columns and powders and contented themselves with sheets of filter paper (i.e. a kind of porous paper which, in its better grades, is almost pure cellulose).

If one end of a strip or sheet of filter paper is immersed in liquid, the liquid will slowly creep up the filter paper. (You can watch this phenomenon yourself if you have a piece of blotting paper and a glass of water handy.) If you keep the filter paper and the liquid in a closed container to prevent evaporation, the liquid will eventually soak through the entire strip if it is not too long.

Now suppose that near the end of a sheet of filter paper you were to place a drop or two of a solution containing a mixture of similar substances and then let the drop dry. Next, dip that end of the sheet into a liquid, being careful to keep the dried drop of mixture above the level of the liquid, and enclose the whole system to cut down evaporation.

Up creeps the liquid. In a short while it reaches and passes the dried drop of mixed substances. Each different component of that mixture is now faced with the usual schizophrenic dilemma. Shall it stay put or shall it let go? Shall it ignore the liquid or shall it go along with it? Each substance makes the usual individual compromise. Each substance moves along with the liquid in a laggard and hesitant way. (Referring back to a home experiment with a blotter and a drop of ink, note that the pigment particles in the ink do not travel as far along the blotting paper as does the water content of the ink, so that the blue drop of spread-out ink is encircled by a colorless damp spot.)

As you can guess, each component of the mixture travels at its own rate. By the time the liquid has soaked a foot or two along the paper, the original spot has become a whole series of spots.

Theoretically, each spot of the series should now contain a single separate substance. Actually, however, in any mixture containing a

number of similar substances, it often happens that two or three may have such similar rates of travel that at the end, they remain in a single spot.

For that reason, the paper is dried, turned on its side, and immersed in a different type of liquid altogether. The first liquid, for instance, might have been a mixture of butyl alcohol and water; the second, a mixture of phenol and water. Substances which have similar rates of travel in one liquid are very likely to have different rates of travel in a second liquid. The two or three substances which had previously stuck together buddy-fashion, bid one another a fond adieu and separate. The whole process is diagrammed in (Figure 2).

This technique is called two-dimensional paper chromatography. Its advantage over the earlier column chromatography is that the equipment needed is dirt-cheap and that very small quantities of material can be handled without difficulty.

Once the spots are separated; once each substance occupies its own individual place on the paper; there is the problem of finding them. Usually, the substances being separated are colorless and the filter paper, after drying has a disconcertingly virginal emptiness about it.

The problem can be solved handily, however. For instance, under ultraviolet light, the spots may fluoresce or appear black. In either case, pencil lines can be drawn about them. Or else, two sheets are prepared in identical fashion and one is treated with some chemical which will combine with some or all of the substances to form a visible color.

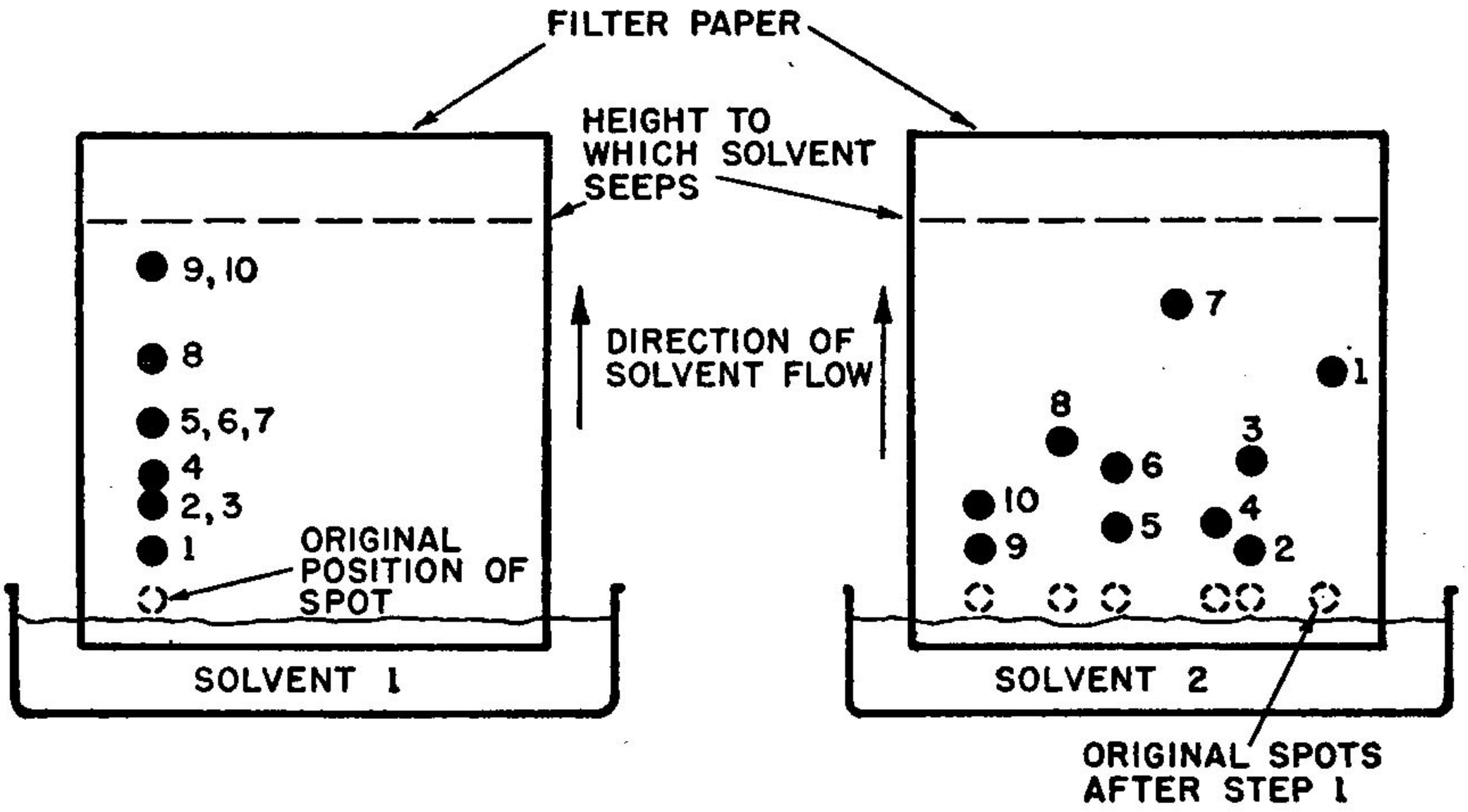


Figure 2: Two-dimensional paper chromatography.

The spots stand out neatly; the colored sheet is superimposed on the untouched sheet, and you take it from there.

Once the spots are located, they can be cut out. Each substance can be dissolved individually out of the paper. Each can be identified and manipulated further. Peace, it's wonderful.

And why am I talking about this? Where are all these filter paper manipulations getting me?

Well, it is paper chromatography which enabled chemists to solve the problem which in an earlier article* I went to great lengths to demonstrate to be "impossible" of solution. That problem involves the structure of protein molecules.

Each protein molecule is made up of hundreds or even thousands of simpler substances called amino acids—of some twenty different varieties—which are strung together like pearls in a necklace. The number of different ways in which a particular combination of amino acids can be arranged even for a protein of only average size is so great that all of space and time—literally, not poetically, speaking—is insufficient to allow each possible way to be tested in order that the one arrangement which actually makes up that protein be discovered.

Nor is this "impossible" problem just a matter of idle curiosity on the part of long-haired biochemists who have nothing better to do.

In case you wonder about that, let's bring insulin to the center of the stage.

Insulin is a protein molecule which is manufactured by certain specialized cells of the pancreas (a gland located just under the stomach). As it is formed, it is secreted into the blood in amounts adjusted to the needs of the body at the moment. The blood carries it to all the cells of the body and there it somehow supervises the utilization of sugars and fats for energy-production purposes.

Exactly how insulin does this is a matter of considerable dispute. Some biochemists think it acts as a control on one particular chemical reaction, through which the entire series of reactions is hastened or slowed according to need. Other biochemists think insulin coats the surface of each cell and controls the flow of raw materials entering, adjusting the cell chemistry in that fashion.

Whatever the exact mechanism, insulin is vital. Every once in a while, the pancreas stops manufacturing this key protein in some individual. The chemistry of the body promptly goes to pot. Glucose—a kind of sugar used by the body for quick energy production—is processed inefficiently. It accumulates in the blood and spills over into the urine. Sugar in the urine or, better still, too much sugar in the blood, is an almost certain sign of this disease, called diabetes.

*HEMOGLOBIN AND THE UNIVERSE, Astounding Science Fiction, February, 1955.

Because a diabetic utilizes his food inefficiently, he grows hungrier; yet though he may increase his food intake, he will lose weight nevertheless. He needs extra water to carry off the sugar continually passing through his kidneys, so he must drink more and urinate more. The disease has its ramifications. The diabetic is more prone to various infections than is the normal person, he is much more likely to suffer from hardening of the arteries if the disease is allowed to take its course.

Although diabetes tends to run in families, its onset in an individual is unpredictable and unpreventable. Once it comes, it is incurable. (Careful diet may delay its approach and keep its effects relatively mild.) Diabetes is the most common chemical disorder of the human body. Millions suffer from this serious disease.

Fortunately, in the 1920s, some Canadian scientists—who later got the Nobel Prize for it—discovered how to isolate insulin from the pancreases of cattle. Using such insulin as a replacement for that which their own pancreases can no longer supply, human diabetics can now live reasonably normal lives.

The use of insulin as a treatment (*not* cure) for diabetes has certain difficulties about it. First, it's only source is the pancreas of slaughtered cattle, swine and so on, and each animal has but one pancreas. There is, therefore, an upper limit to how much insulin can be made available. Secondly, insulin cannot be taken by mouth, since it is digested and made useless in the stomach and intestines. It must be injected by hypodermic needle, which is troublesome.

Now *if* the exact structure of insulin were known—not just the approximate structure but the *exact* structure—biochemists might be better able to decide from that structure its method of working, now under such dispute. They might make an intelligent guess at what features of its molecule were most necessary for its purpose and synthesize a simpler molecule containing those features. If the simpler molecules worked to control diabetes, it would mean that there would be a potentially limitless supply of drug not dependent on cattle. Furthermore, it might be simple enough to withstand digestion, in which case it might be taken by mouth.

This sort of procedure has actually been carried out in the case of certain alkaloids. The structure of the local anesthetic, cocaine, was worked out and simpler substances, containing the essential features of the molecule, were synthesized. Such a synthetic substitute-cocaine is novocaine which, in some respects, is more useful than the natural drug.

So you see then that in the case of insulin, at least, the exact arrangement of the amino acids is anything but an academic problem. It has an important application to a serious health problem.

The size of the insulin molecule

can be determined in a number of ways and it is found to have a molecular weight of 12,000. This is 660 times as great as the weight of a water molecule but only one-fifth the weight of an averagely-sized protein such as hemoglobin. Despite its small size for a protein, insulin still has room for about a hundred amino-acid components, which makes the problem of its exact structure a sizable one.

The insulin molecule can be broken up into the individual amino-acid components by prolonged treatment with acid. Before 1944 this wouldn't have helped much because many of the amino-acids are quite similar in structure and it is the devil's own job to tackle the analysis of amino-acid mixtures in the expectation of determining how much of each amino-acid is present. With paper chromatography, however, the problem is simple. A drop of the mixture is placed on the filter paper, two different solvents are used in two different directions, and the various amino-acids are spread out neatly so that the identity of each and the quantity present can be determined.

In this way, it was found that the molecule of insulin contained 96 amino-acids of 18 different types. For our purposes, the names of the different amino-acids are unnecessary. We can list them in alphabetical order and call them A, B, C, through R.

The fifth amino acid—in alphabetical order—is different from the rest in that it is a double molecule, or a two-headed molecule if you prefer. One end of it can form part of one amino-acid chain and the other end of it can form part of a second amino-acid chain. For that reason, it will be referred to as E-E, instead of simply E.

Table 1 lists the different amino-acids and gives the number of each which is found in the insulin molecule. The number of ways in which those ninety-six amino acids can be arranged in a chain to form a protein molecule is three googols; that is,

TABLE 1

Amino-Acid Composition of Insulin

Type of Amino-Acid	*Number in Insulin Molecule*
A	6
B	2
C	4
D	2
E-E	6
F	8
G	2
H	12
I	4
J	2
K	12
L	2
M	6
N	2
O	6
P	2
Q	8
R	10
Total	96

3×10^{100} or a 3 followed by 100 zeroes. I won't go through the gyrations I went through in my previous article to prove that this is a large number. Take my word for it. The total number of all subatomic particles contained in a trillion suns is nothing in comparison to it.

Which of the three googols of possible arrangements is the right one? Give up? Well, a group of British biochemists under the direction of Dr. F. Sanger didn't. They began working on the problem in 1945 or thereabouts.

One point of attack in any amino-acid chain are the end amino-acids. Suppose you had the chain, F-G-H-I-J-K. Obviously, F and K differ from the other amino-acids in that each has one end free. F has its acid side free and K has its amino side free. (Arbitrarily, I write the chain so that the acid ends of each amino-acid component is at the left and the amino ends of each at the right. It could be done the other way around just as easily).

Sanger and his groups discovered that if an amino-acid chain is treated with a certain colored chemical—which is now called Sanger's Reagent in his honor—it will attach itself to the unattached amino group at the extreme right-hand end of the chain. You would have this situation in the case we have presented: F-G-H-I-J-KS, where S represents Sanger's Reagent.

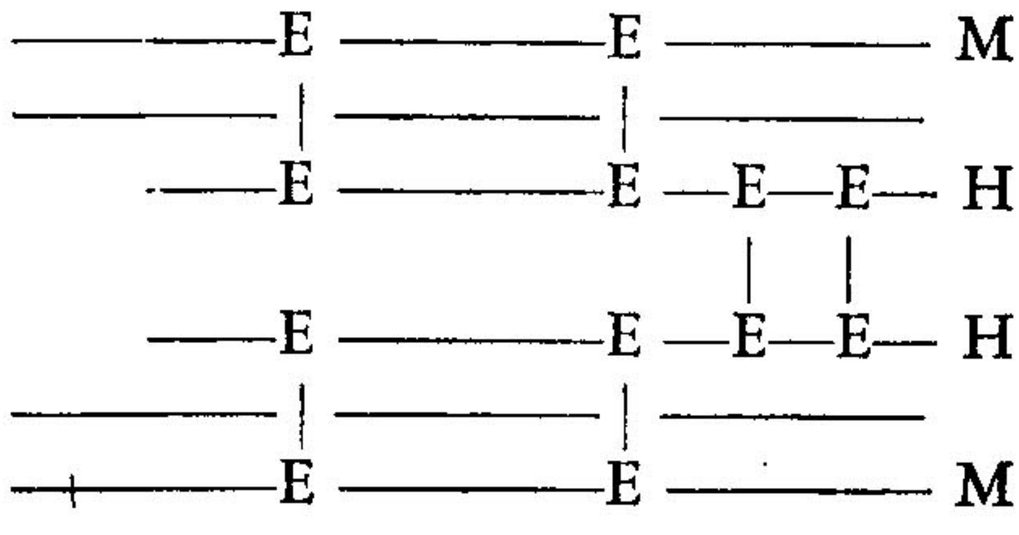
If, after treatment, the chain is broken into individual amino-acids by acid treatment, Sanger's Reagent remains combined and you're left with F, G, H, I, J, and KS. The mixture can be chromatographed and the KS is extremely easy to locate since, like Sanger's Reagent alone, it is colored and the other amino-acids are not. The KS can be dissolved out of the paper, Sanger's Reagent can be forced off and the amino-acid identified. In this way, one can decide the particular amino acid which exists at the extreme right end of an amino-acid chain.

Sanger's group applied this principle to insulin and found that every molecule of insulin yielded *four* amino-acids to which Sanger's reagent was attached. Two of these amino-acids were H and two were M (using our alphabetical arrangement).

The only conclusion was that every insulin molecule consists of four separate amino-acid chains held together by the double-headed amino-acid E-E of which there are six in every molecule. The picture so far is shown diagrammatically in (Figure 3).

FIGURE 3

Diagrammatic Structure of Insulin Molecule

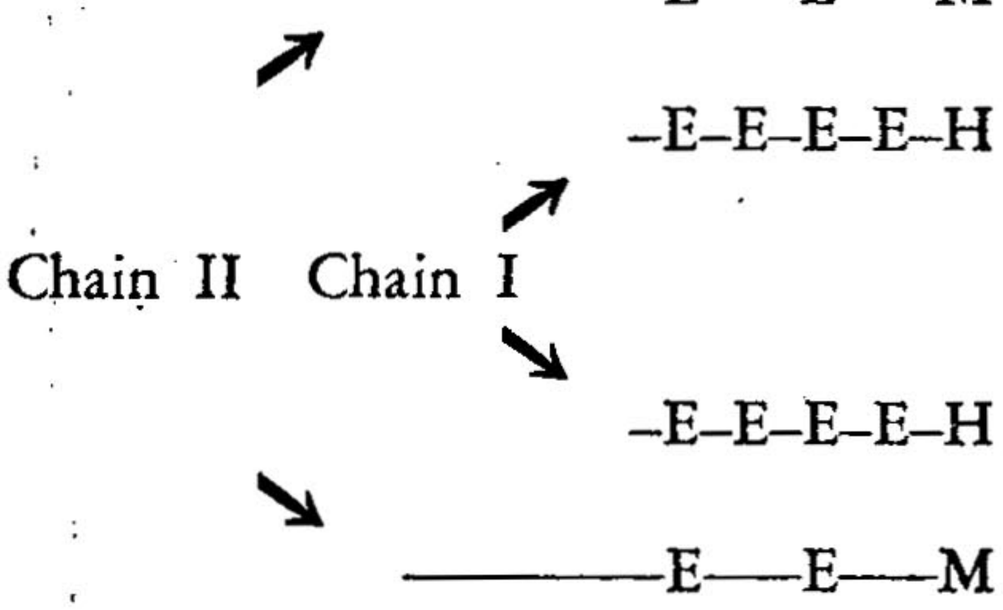


Now there is a way of breaking the double-headed E-E into two single-headed fragments, E and E, without disturbing other portions of the amino-acid chains. The chemical used is one called performic acid.

Sanger and company treated insulin with performic acid—what an opportunity for puns—and found themselves left with the four isolated amino-acid chains shown in (Figure 4).

FIGURE 4

Separated Amino-Acid Chains of Insulin



The two chains ending in H and containing four E's apiece turned out to be identical, judging from the results of various tests. Let's refer to such a chain as Chain I. The two chains ending in M and containing two E's apiece are also identical. Call such a chain Chain II. Since Chain I and Chain II are different in structure, they have different chemical properties and can be separated easily enough.

Once separated, Chain I and Chain II can be separately broken up into individual amino-acids by treatment with acid. The resulting amino-acid soup from each type of chain can be and was analyzed by paper chromatography. In this way, the different amino-acids in each chain can be identified both as to nature and quantity. The results are shown in (Table 2).

TABLE 2

Amino-Acid Composition of Chain I and Chain II

Type of Amino-Acid	*Number in Chain I*	*Number in Chain II*
A	1	2
B	0	1
C	2	0
D	0	1
E	4	2
F	2	2
G	0	1
H	3	3
I	0	2
J	1	0
K	2	4
L	0	1
M	0	3
N	0	1
O	2	1
P	0	1
Q	2	2
R	2	3
Totals	21	30

Notice that Chain I consists of twenty-one amino-acids and Chain II of thirty amino-acids. Since each insulin molecule consists of two of Chain I and two of Chain II, the total number of amino acids in insulin comes to one hundred and two.

Earlier, I said ninety-six. This is no discrepancy, however, since in breaking apart the four amino-acid chains of insulin, the six E-E amino-acids were converted to twelve E amino-acids, thus adding six amino-acids to the total. 96 plus 6 equals 102, Q. E. D.

Have we gotten anywhere? Well, now it is only necessary to determine the arrangement of the amino-acids in each of the two varieties of chains. The number of possible arrangements in Chain II is 3×10^{27} and that of Chain I is 6×10^{15}. These aren't exactly small numbers, but in comparison to 10^{100}, they are nothing. Nothing at all. Why 3×10^{27} is only half the size of the number of grams of mass contained in the Earth. As for 6×10^{15}, it is only six million billion, which is laughable.

So Sanger and company have made progress.

Where next?

Suppose we take Chain II and subject it to acid treatment. The acid breaks the links between the amino-acids more or less at random, sometimes here, sometimes there, in no particular order. If you let it work to the bitter end, all the links between amino-acids are broken. But what if you stop the action by neutralizing the acid before the job is completed? In that case, you end up with various fragments of the chain that haven't been completely broken apart. Two amino-acids remain stuck together from one portion of the chain, two from another, three from still another, four from yet another. In short, you get a potpourri of just about every possible combination of two, three, or four amino acids that the chain can yield.

This potpourri can be partially separated. Actually, five different groups of chain fragments can be isolated by conventional chemical treatment. Each group is still a complex mixture, of course, yet each group can be separated easily enough into its different components by two-dimensional paper chromatography.

Once separated, each individual chain fragment can be dissolved out of the paper and placed in a separate test tube. Each fragment can be separately treated with acid and this time the acid is allowed to do the complete job. Each chain fragment is cut up into individual amino-acids and *that* mixture then takes the filter-paper path to analysis. The individual amino-acids in each separate chain are thus identified.

In this way, it is found that one chain fragment consists of amino-acids E, H, and R. Another one consists of D, G, R, and M. And so on and so on and so on.

But what about the order of amino-acids in these fragments? If a fragment contains E, H, and R, is its structure E-H-R, E-R-H, R-E-H, R-H-E, H-E-R, or H-R-E?

One piece of information can be obtained by treating a particular chain fragment with Sanger's reagent before subjecting it to acid and thus identifying the amino-acid at the

right-hand end of the fragment.

If the fragment happens to consist only of two amino-acids, that gives us its structure at once. If it contains A and B and it is B that is on the right, obviously its structure is A-B. Nothing else is possible. In this way, nearly thirty-two amino-acid fragments were identified as coming from the partial break-up of Chain II.

From that point, a process of reasoning follows that is similar to the type used in solving jigsaw puzzles or cryptograms.

For instance, Chain II contains only one of amino-acid, D. Two different chains of two amino-acids, each containing D, were isolated. One had the structure G-D and the other D-R. Obviously then, Chain II must contain the combination G-D-R. It is the only combination from which one can obtain both G-D and D-R.

There is an amino-acid chain of three amino acids which contains D, R and M, with M at the right-hand end. The chain of three can only be D-R-M or R-D-M. But we know that R follows the only D in the chain. The three combination can only be D-R-M. Furthermore, we know that G precedes the only D in Chain II. So, it is now known that Chain II contains the following sequence of four amino-acids, G-D-R-M.

Analysis proceeds in this manner. There is only one amino-acid, B, in the chain. Since H-B and B-F are found, the sequence H-B-F is established.

Again there is only one amino-acid N present. A fragment of structure N-P is found. Also one containing three amino-acids with N at the right end is found. The latter is either L-A-N or A-L-N. No fragment of structure L-A is ever found, however. One of structure A-L *is* found. The three amino-acid chain must, therefore, be A-L-N and since there is also the N-P previously mentioned, a four-amino-acid sequence, A-L-N-P, has been established.

Little by little the chain sequence is put together until finally the only (!!!!) arrangement of thirty amino-acids which will account for *all* the chain fragments located by paper chromatography is decided upon. One arrangement out of 3×10^{27} possibilities. One arrangement only. It's like looking for a particular two-gram chunk of matter—1/14th of an ounce—somewhere in Earth's massive rotundity, *and finding it.*

By similar methods, the arrangement of amino-acids in Chain I is also determined. The arrangements for both chains is shown in (Figure 5). The manner in which two Chain

FIGURE 5

Amino-Acid Arrangement in Chain I and Chain II

C-E-Q-C-H-K-H-Q-K-O-E-R-O-
A-E-E-F-F-R-J-H

Chain I

A-L-N-P-Q-M-M-H-B-F-H-E-R-
K-Q-K-A-F-R-K-I-O-H-E-K-I-G-
D-R-M

Chain II

I's and two Chain II's are hooked up to form insulin becomes a mere detail, and it can be stated that Sanger and his group have determined the exact amino-acid structure of insulin.

It would be pleasant if I could proceed now to say that the determination of insulin's structure shed an immediate and brilliant light on insulin's method of working or that it served to present an immediate hope for an improved treatment of diabetes.

Unfortunately, I can't. So far, the victory on (filter) paper remains only a victory on paper as far as clinicians are concerned.

The arrangement of amino-acids in insulin seems to have no significance. We stare at it and it makes no illuminating sense. Minor changes in the insulin molecule destroy its effectiveness completely and no one part of the molecule appears more important than another part.

Is no further progress possible? Can no chemical even slightly simpler than insulin possibly substitute for it?

I don't know. Yet I'm not entirely depressed, either.

It took Sanger and his men eight years to solve the "impossible" problem of finding one arrangement out of several googols of possible arrangements. We shouldn't object to giving biochemists a few more years to see what other impossibilities they can knock off.

THE END

THE ANALYTICAL LABORATORY

The June issue of Astounding carried six stories—the usual wordage total, but distributed toward the short story end of the range. This tended to make story-scores higher—but Poul Anderson's "The Long Way Home" definitely did all right. Here's the score:

PLACE	STORY	AUTHOR	POINTS
1.	The Long Way Home (Pt. III)	Poul Anderson	1.61
2.	Final Weapon	Everett B. Cole	2.69
3.	The Guardians	Irving Cox, Jr.	3.00
4.	Criminal Negligence	J. Francis McComas	3.42
5.	Shock Absorber	E. G. von Wald	3.92

And Isaac Asimov's article, which can't be rated in with the stories, got many comments—largely from professional scientists, and largely along the line of "Brother, you are soooooo right!" That was "The Sound of Panting," if you recall. . . .

THE EDITOR.

BLESSED ARE THE MEEK

Every strength is a weakness, and every weakness is a strength. And when the Strong start smashing each other's strength . . . the Weak may turn out to be, instead, the Wise.

BY G. C. EDMONDSON

Illustrated by Freas

The strangers landed just before dawn, incinerating a good li of bottom land in the process. Their machines were already busily digging up the topsoil. The Old One watched, squinting into the morning sun. He sighed, hitched up his saffron robes and started walking down toward the strangers.

Griffin turned, not trying to conceal his excitement. "You're the linguist, see what you can get out of him."

"I might," Kung Su ventured sourly, "if you'd go weed the air machine or something. This is going to be hard enough without a lot of kibitzers cramping my style and

scaring Old Pruneface here half to death."

"I see your point," Griffin answered. He turned and started back toward the diggings. "Let me know if you make any progress with the local language." He stopped whistling and strove to control the jauntiness of his gait. *Must be the lower gravity and extra oxygen,* he thought. *I haven't bounced along like this for thirty years. Nice place to settle down if some promoter doesn't turn it into an old folks home.* He sighed and glanced over the diggings. The rammed earth walls were nearly obliterated by now. *Nothing lost,* he reflected. *It's all on tape and they're no different from a thousand others at any rate.*

Griffin opened a door in the transparent bubble from which Albañez was operating the diggers. "Anything?" he inquired.

"Nothing so far," Albañez reported. "What's the score on this job? I missed the briefing."

"How'd you make out on III, by the way?"

"Same old stuff, pottery shards and the usual junk. See it once and you've seen it all."

"Well," Griffin began, "it looks like the same thing here again. We've pretty well covered this system and you know how it is. Rammed earth walls here and there, pottery shards, flint, bronze and iron artifacts and that's it. They got to the iron age on every planet and then blooey."

"Artifacts all made for humanoid hands I suppose. I wonder if they were close enough to have crossbred with humans."

"I couldn't say," Griffin observed dryly. "From the looks of Old Pruneface I doubt if we'll ever find a human female with sufficiently detached attitude to find out."

"Who's Pruneface?"

"He came ambling down out of the hills this morning and walked into camp."

"You mean you've actually found a live humanoid?"

"There's got to be a first time for everything." Griffin opened the door and started climbing the hill toward Kung Su and Pruneface.

"Well, have you gotten beyond the 'me, Charlie' stage yet?" Griffin inquired at breakfast two days later.

Kung Su gave an inscrutable East Los Angeles smile. "As a matter of fact, I'm a little farther along. Joe is amazingly coöperative."

"Joe?"

"Spell it Chou if you want to be exotic. It's still pronounced Joe and that's his name. The language is monosyllabic and tonal. I happen to know a similar language."

"You mean this humanoid speaks Chinese?" Griffin was never sure whether Kung was ribbing him or not.

"Not Chinese. The vocabulary is different but the syntax and phonemes are nearly identical. I'll speak it perfectly in a week. It's just a question of memorizing two or three thousand new words. Incidentally,

Joe wants to know why you're digging up his bottom land. He was all set to flood it today."

"Don't tell me he plants rice!" Griffin exclaimed.

"I don't imagine it's rice, but it needs flooding whatever it is."

"Ask him how many humanoids there are on this planet."

"I'm way ahead of you, Griffin. He says there are only a few thousand left. The rest were all destroyed in a war with the barbarians."

"Barbarians?"

"They're extinct."

"How many races were there?"

"I'll get to that if you'll stop interrupting," Kung rejoined testily. "Joe says there are only two kinds of people, his own dark, straight-haired kind and the barbarians. They have curly hair, white skin and round eyes. You'd pass for a barbarian, according to Joe, only you don't have a faceful of hair. He wants to know how things are going on the other planets."

"I suppose that's my cue to break into a cold sweat and feel a premonition of disaster." Griffin tried to smile and almost made it.

"Not necessarily, but it seems our iron-age man is fairly well informed in extraplanetary affairs."

"I guess I'd better start learning the language."

Thanks to the spade work Kung Su had done in preparing hypno-recordings, Griffin had a working knowledge of the Rational People's language eleven days later when he sat down to drink herb infused hot water with Joe and other Old Ones in the low-roofed wooden building around which clustered a village of two hundred humanoids. He fidgeted through interminable ritualistic cups of hot water. Eventually Joe hid his hands in the sleeves of his robe and turned with an air of polite inquiry. *Now we get down to business,* Griffin thought.

"Joe, you know by now why we're digging up your bottom land. We'll recompense you in one way or another. Meanwhile, could you give me a little local history?"

Joe smiled like a well nourished bodhisattva. "Approximately how far back would you like me to begin?"

"At the beginning."

"How long is a year on your planet?" Joe inquired.

"Your year is eight and a half days longer. Our day is three hundred heartbeats longer than yours."

Joe nodded his thanks. "More water?"

Griffin declined, suppressing a shudder.

"Five million years ago we were limited to one planet," Joe began. "The court astronomer had a vision of our planet in flames. I imagine you'd say our sun was about to nova. The empress was disturbed and ordered a convocation of seers. One fasted overlong and saw an answer. As the dying seer predicted the Son of Heaven came with fire-breathing dragons. The fairest of maidens and the strongest of our young men were taken to serve his warriors. We

served them honestly and faithfully. A thousand years later their empire collapsed leaving us scattered across the universe. Three thousand years later a new race of barbarians conquered our planets. We surrendered naturally and soon were serving our new masters. Five hundred years passed and they destroyed themselves. This has been the pattern of our existence from that day to this."

"You mean you've been slaves for five million years?" Griffin was incredulous.

"Servitude has ever been a refuge for the scholar and the philosopher."

"But what point is there in such a life? Why do you continue living this way?"

"What is the point in any way of life? Continued existence. Personal immortality is neither desirable nor possible. We settled for perpetuation of the race."

"But what about self-determination? You know enough astronomy to understand novae. Surely you realize it could happen again. What would you do without a technology to build spaceships?"

"Many stars have gone nova during our history. Usually the barbarians came in time. When they didn't—"

"You mean you don't really care?"

"All barbarians ask that sooner or later," Joe smiled. "Sometimes toward the end they even accuse us of destroying them. We don't. Every technology bears the seeds of its own destruction. The stars are older than the machinery that explores them."

"You used technology to get from one system to another."

"We used it, but we were never part of it. When machines fail, their people die. We have no machines."

"What would you do if this sun were to nova?"

"We can serve you. We are not unintelligent."

"Willing to work your way around the galaxy, eh? But what if we refused to take you?"

"The race would go on. Kung Su tells me there is no life on planets of this system, but there are other systems."

"You're whistling in the dark," Griffin scoffed. "How do you know if any of the Rational People survive?"

"How far back does your history go?" Joe inquired.

"It's hard to say exactly," Griffin replied. "Our earliest written records date back some seven thousand years."

"You are all of one race?"

"No, you may have noticed Kung Su is slightly different from the rest of us."

"Yes, Griffin, I have noticed. When you return ask Kung Su for the legend of creation. More hot water?" Joe stirred and Griffin guessed the interview was over. He drank another ritual cup, made his farewells and walked thoughtfully back to camp.

"Kung," Griffin asked over coffee next afternoon, "how well up are you on Chinese mythology?"

"Oh, fair, I guess. It isn't my field but I remember some of the stories my grandfather used to tell me."

"What is your legend of creation?" Griffin persisted.

"It's pretty well garbled but I remember something about the Son of Heaven bringing the early settlers from a land of two moons on the back of his fire-breathing dragon. The dragon got sick and died so they couldn't ever get back to heaven again. There's a lot of stuff about devils, too."

"What about devils?"

"I don't remember too well, but they were supposed to do terrible things to you and even to your unborn children if they ever caught you. They must have been pretty stupid though; they couldn't turn corners. My grandfather's store had devil screens at all the doors so you had to turn a corner to get in. The first time I saw the lead baffles at the pile chamber doors on this ship it reminded me of home sweet home. By the way, some young men from the village were around today. They want to work passage to the next planet. What do you think?"

Griffin was silent for a long time.

"Well, what do you say? We can use some hand labor for the delicate digging. Want to put them on?"

"Might as well." Griffin answered. "There's a streetcar every millennium anyway."

"What do you mean by that?"

"You wouldn't understand. You sold your birthright to the barbarians."

THE END

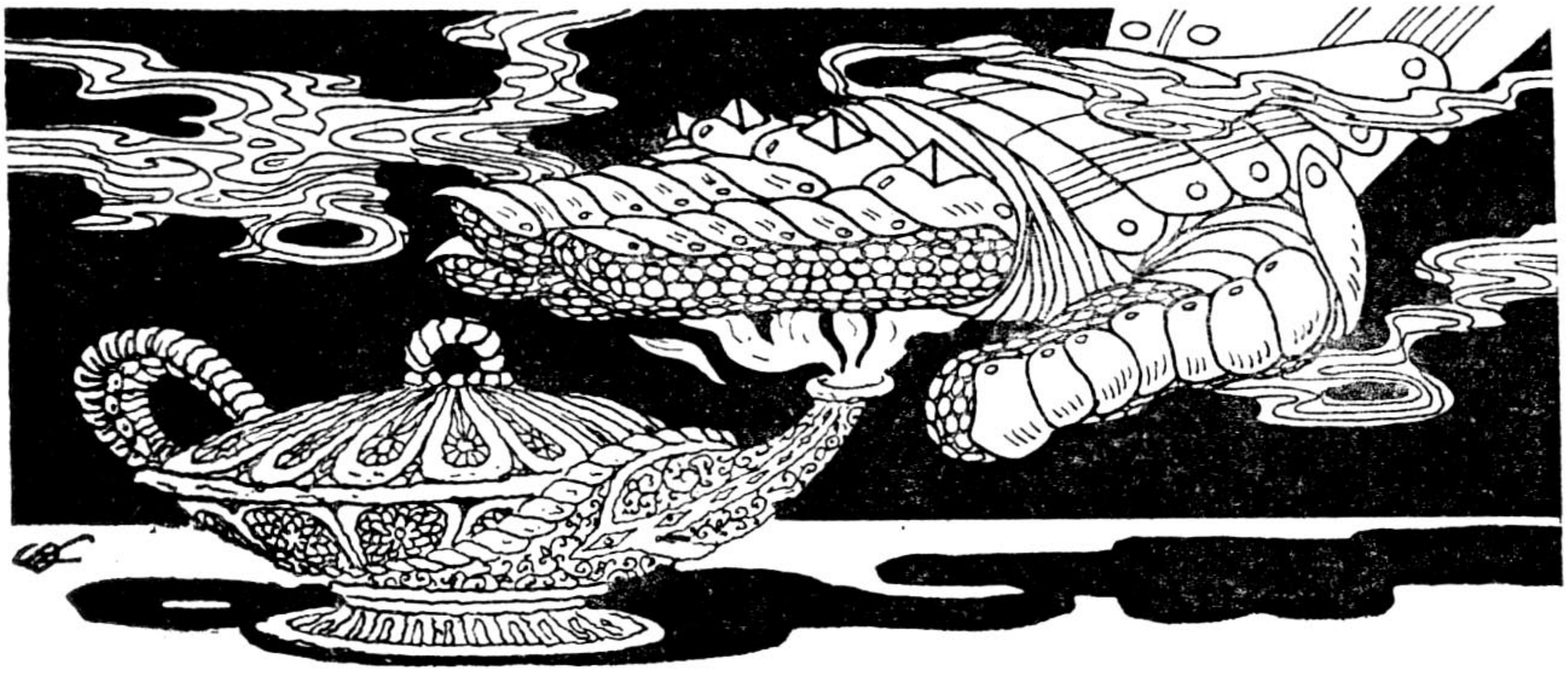
IN TIMES TO COME

Next month's cover will be a symbolic—which, in essence, means a story-complete-in-one-picture. Emsh, who did it, might have titled it "Last Command"—but you'll be seeing it. There are some things that the most perfect imaginable robot can't do. . . .

The lead story will be "The Short Life," by Francis Donovan, a new man—illustrated by Rogers. An entity forced to act quickly in an unfamiliar world can make a serious mistake with the best of good intent—and can, thereby, bollix up a situation for years, even centuries, to come. Pressed for time, there is always the twin risk of Taking the Risk—and the sometimes greater danger of Not Taking the Risk. What to do—with only one chance to try!

And, of course, Part Three of Eric Frank Russell's "Call Him Dead." Russell always has been able to present such magnificently simple, and simply frightful, obvious inscrutabilities. I, for one, like this simple problem of finding the perfectly camouflaged!

THE EDITOR.



SCRIMSHAW

The old man just wanted to get back his memory—and the methods he used were gently hellish, from the viewpoint of the others . . .

BY MURRAY LEINSTER

Illustrated by Freas

Pop Young was the one known man who could stand life on the surface of the Moon's far side, and, therefore, he occupied the shack on the Big Crack's edge, above the mining colony there. Some people said that no normal man could do it, and mentioned the scar of a ghastly head-wound to explain his ability. One man partly guessed the secret, but only partly. His name was Sattell and he had reason not to talk. Pop Young alone knew the whole truth, and he kept his mouth shut, too. It wasn't anybody else's business.

The shack and the job he filled were located in the medieval notion of the physical appearance of hell. By day the environment was heat and torment. By night—lunar night, of course, and lunar day—it was frigidity and horror. Once in two weeks Earth-time a rocketship came around

the horizon from Lunar City with stores for the colony deep underground. Pop received the stores and took care of them. He handed over the product of the mine, to be forwarded to Earth. The rocket went away again. Come nightfall Pop lowered the supplies down the long cable into the Big Crack to the colony far down inside, and freshened up the landing field marks with magnesium marking-powder if a rocket-blast had blurred them. That was fundamentally all he had to do. But without him the mine down in the Crack would have had to shut down.

The Crack, of course, was that gaping rocky fault which stretches nine hundred miles, jaggedly, over the side of the Moon that Earth never sees. There is one stretch where it is a yawning gulf a full half-mile wide and unguessably deep. Where Pop Young's shack stood it was only a hundred yards, but the colony was a full mile down, in one wall. There is nothing like it on Earth, of course. When it was first found, scientists descended into it to examine the exposed rock-strata and learn the history of the Moon before its craters were made. But they found more than history. They found the reason for the colony and the rocket landing field and the shack.

The reason for Pop was something else.

The shack stood a hundred feet from the Big Crack's edge. It looked like a dust-heap thirty feet high, and it was. The outside was surface moondust, piled over a tiny dome to be insulation against the cold of night and shadow and the furnace heat of day. Pop lived in it all alone, and in his spare time he worked industriously at recovering some missing portions of his life that Sattell had managed to take away from him.

He thought often of Sattell, down in the colony underground. There were galleries and tunnels and living-quarters down there. There were air-tight bulkheads for safety, and a hydroponic garden to keep the air fresh, and all sorts of things to make life possible for men under if not on the Moon.

But it wasn't fun, even underground. In the Moon's slight gravity, a man is really adjusted to existence when he has a well-developed case of agoraphobia. With such an aid, a man can get into a tiny, coffinlike cubbyhole, and feel solidity above and below and around him, and happily tell himself that it feels delicious. Sometimes it does.

But Sattell couldn't comfort himself so easily. He knew about Pop, up on the surface. He'd shipped out, whimpering, to the Moon to get far away from Pop, and Pop was just about a mile overhead and there was no way to get around him. It was difficult to get away from the mine, anyhow. It doesn't take too long for the low gravity to tear a man's nerves to shreds. He has to develop kinks in his head to survive. And those kinks—

The first men to leave the colony

had to be knocked cold and shipped out unconscious. They'd been underground—and in low gravity—long enough to be utterly unable to face the idea of open spaces. Even now there were some who had to be carried, but there were some tougher ones who were able to walk to the rocketship if Pop put a tarpaulin over their heads so they didn't have to see the sky. In any case Pop was essential, either for carrying or guidance.

Sattell got the shakes when he thought of Pop, and Pop rather probably knew it. Of course, by the time he took the job tending the shack, he was pretty certain about Sattell. The facts spoke for themselves.

Pop had come back to consciousness in a hospital with a great wound in his head and no memory of anything that had happened before that moment. It was not that his identity was in question. When he was stronger, the doctors told him who he was, and as gently as possible what had happened to his wife and children. They'd been murdered after he was seemingly killed defending them. But he didn't remember a thing. Not then. It was something of a blessing.

But when he was physically recovered he set about trying to pick up the threads of the life he could no longer remember. He met Sattell quite by accident. Sattell looked familiar. Pop eagerly tried to ask him questions. And Sattell turned gray and frantically denied that he'd ever seen Pop before.

All of which happened back on Earth and a long time ago. It seemed to Pop that the sight of Sattell had brought back some vague and cloudy memories. They were not sharp, though, and he hunted up Sattell again to find out if he was right. And Sattell went into panic when he returned.

Nowadays, by the Big Crack, Pop wasn't so insistent on seeing Sattell, but he was deeply concerned with the recovery of the memories that Sattell helped bring back. Pop was a highly conscientious man. He took good care of his job. There was a warning-bell in the shack, and when a rocketship from Lunar City got above the horizon and could send a tight beam, the gong clanged loudly, and Pop got into a vacuum-suit and went out the air lock. He usually reached the moondozer about the time the ship began to brake for landing, and he watched it come in.

He saw the silver needle in the sky fighting momentum above a line of jagged crater-walls. It slowed, and slowed, and curved down as it drew nearer. The pilot killed all forward motion just above the field and came steadily and smoothly down to land between the silvery triangles that marked the landing place.

Instantly the rockets cut off, drums of fuel and air and food came out of the cargo-hatch and Pop swept forward with the dozer. It was a miniature tractor with a gigantic scoop in front. He pushed a great

mound of talc-fine dust before him to cover up the cargo. It was necessary. With freight costing what it did, fuel and air and food came frozen solid, in containers barely thicker than foil. While they stayed at space-shadow temperature, the foil would hold anything. And a cover of insulating moon-dust with vacuum between the grains kept even air frozen solid, though in sunlight.

At such times Pop hardly thought of Sattell. He knew he had plenty of time for that. He'd started to follow Sattell knowing what had happened to his wife and children, but it was hearsay only. He had no memory of them at all. But Sattell stirred the lost memories. At first Pop followed absorbedly from city to city, to recover the years that had been wiped out by an axe-blow. He did recover a good deal. When Sattell fled to another continent, Pop followed because he had some distinct memories of his wife—and the way he'd felt about her—and some fugitive mental images of his children. When Sattell frenziedly tried to deny knowledge of the murder in Tangier, Pop had come to remember both his children and some of the happiness of his married life.

Even when Sattell—whimpering—signed up for Lunar City, Pop tracked him. By that time he was quite sure that Sattell was the man who'd killed his family. If so, Sattell had profited by less than two days' pay for wiping out everything that Pop possessed. But Pop wanted it back. He couldn't prove Sattell's guilt. There was no evidence. In any case, he didn't really want Sattell to die. If he did, there'd be no way to recover more lost memories.

Sometimes, in the shack on the far side of the Moon, Pop Young had odd fancies about Sattell. There was the mine, for example. In each two Earth-weeks of working, the mine-colony nearly filled up a three-gallon cannister with greasy-seeming white crystals shaped like two pyramids base to base. The filled cannister would weigh a hundred pounds on Earth. Here it weighed eighteen. But on Earth its contents would be computed in carats, and a hundred pounds was worth millions. Yet here on the Moon Pop kept a waiting cannister on a shelf in his tiny dome, behind the air-apparatus. It rattled if he shook it, and it was worth no more than so many pebbles. But sometimes Pop wondered if Sattell ever thought of the value of the mine's production. If he would kill a woman and two children and think he'd killed a man for no more than a hundred dollars, what enormity would he commit for a three-gallon quantity of uncut diamonds?

But he did not dwell on such speculation. The sun rose very, very slowly in what by convention was called the east. It took nearly two hours to urge its disk above the horizon, and it burned terribly in emptiness for fourteen times twenty-four hours before sunset. Then there was night, and for three hundred and thirty-six consecutive hours there

were only stars overhead and the sky was a hole so terrible that a man who looked up into it—what with the nagging sensation of one-sixth gravity—tended to lose all confidence in the stability of things. Most men immediately found it hysterically necessary to seize hold of something solid to keep from falling upward. But nothing felt solid. Everything fell, too. Wherefore most men tended to scream.

But not Pop. He'd come to the Moon in the first place because Sattell was here. Near Sattell, he found memories of times when he was a young man with a young wife who loved him extravagantly. Then pictures of his children came out of emptiness and grew sharp and clear. He found that he loved them very dearly. And when he was near Sattell he literally recovered them—in the sense that he came to know new things about them and had new memories of them every day. He hadn't yet remembered the crime which lost them to him. Until he did—and the fact possessed a certain grisly humor—Pop didn't even hate Sattell. He simply wanted to be near him because it enabled him to recover new and vivid parts of his youth that had been lost.

Otherwise, he was wholly matter-of-fact—certainly so for the far side of the Moon. He was a rather fussy housekeeper. The shack above the Big Crack's rim was as tidy as any lighthouse or fur-trapper's cabin. He tended his air-apparatus with a fine precision. It was perfectly simple. In the shadow of the shack he had an unfailing source of extreme low temperature. Air from the shack flowed into a shadow-chilled pipe. Moisture condensed out of it here, and CO_2 froze solidly out of it there, and on beyond it collected as restless, transparent liquid air. At the same time, liquid air from another tank evaporated to maintain the proper air pressure in the shack. Every so often Pop tapped the pipe where the moisture froze, and lumps of water ice clattered out to be returned to the humidifier. Less often he took out the CO_2 snow, and measured it, and dumped an equivalent quantity of pale-blue liquid oxygen into the liquid air that had been purified by cold. The oxygen dissolved. Then the apparatus reversed itself and supplied fresh air from the now-enriched fluid, while the depleted other tank began to fill up with cold-purified liquid air.

Outside the shack, jagged stony pinnacles reared in the starlight, and craters complained of the bombardment from space that had made them. But, outside, nothing ever happened. Inside, it was quite different.

Working on his memories, one day Pop made a little sketch. It helped a great deal. He grew deeply interested. Writing-material was scarce, but he spent most of the time between two particular rocket-landings getting down on paper exactly how a child had looked while sleeping, some fifteen years before. He remembered with astonishment that the child had really looked exactly

like that! Later he began a sketch of his partly-remembered wife. In time —he had plenty—it became a really truthful likeness.

The sun rose, and baked the abomination of desolation which was the moonscape. Pop Young meticulously touched up the glittering triangles which were landing guides for the Lunar City ships. They glittered from the thinnest conceivable layer of magnesium marking-powder. He checked over the moondozer. He tended the air apparatus. He did everything that his job and survival required. Ungrudgingly.

Then he made more sketches. The images to be drawn came back more clearly when he thought of Sattell, so by keeping Sattell in mind he recovered the memory of a chair that had been in his forgotten home. Then he drew his wife sitting in it, reading. It felt very good to see her again. And he speculated about whether Sattell ever thought of millions of dollars' worth of new-mined diamonds knocking about unguarded in the shack, and he suddenly recollected clearly the way one of his children had looked while playing with her doll. He made a quick sketch to keep from forgetting that.

There was no purpose in the sketching, save that he'd lost all his young manhood through a senseless crime. He wanted his youth back. He was recovering it bit by bit. The occupation made it absurdly easy to live on the surface of the far side of the Moon, whether anybody else could do it or not.

Sattell had no such device for adjusting to the lunar state of things. Living on the Moon was bad enough anyhow, then, but living one mile underground from Pop Young was much worse. Sattell clearly remembered the crime Pop Young hadn't yet recalled. He considered that Pop had made no overt attempt to revenge himself because he planned some retaliation so horrible and lingering that it was worth waiting for. He came to hate Pop with an insane ferocity. And fear. In his mind the need to escape became an obsession on top of the other psychotic states normal to a Moon-colonist.

But he was helpless. He couldn't leave. There was Pop. He couldn't kill Pop. He had no chance—and he was afraid. The one absurd, irrelevant thing he could do was write letters back to Earth. He did that. He wrote with the desperate, impassioned, frantic blend of persuasion and information and genius-like invention of a prisoner in a high-security prison, trying to induce someone to help him escape.

He had friends, of a sort, but for a long time his letters produced nothing. The Moon swung in vast circles about the Earth, and the Earth swung sedately about the Sun. The other planets danced their saraband. The rest of humanity went about its own affairs with fascinated attention. But then an event occurred which bore directly upon Pop Young and Sattell and Pop Young's missing years.

Somebody back on Earth promot-

ed a luxury passenger-line of spaceships to ply between Earth and Moon. It looked like a perfect set-up. Three spacecraft capable of the journey came into being with attendant reams of publicity. They promised a thrill and a new distinction for the rich. Guided tours to Lunar! The most expensive and most thrilling trip in history! One hundred thousand dollars for a twelve-day cruise through space, with views of the Moon's far side and trips through Lunar City and a landing in Aristarchus, plus sound-tapes of the journey and fame hitherto reserved for honest explorers!

It didn't seem to have anything to do with Pop or with Sattell. But it did.

There were just two passenger tours. The first was fully booked. But the passengers who paid so highly, expected to be pleasantly thrilled and shielded from all reasons for alarm. And they couldn't be. Something happens when a self-centered and complacent individual unsuspectingly looks out of a spaceship port and sees the cosmos unshielded by mists or clouds or other aids to blindness against reality. It is shattering.

A millionaire cut his throat when he saw Earth dwindled to a mere blue-green ball in vastness. He could not endure his own smallness in the face of immensity. Not one passenger disembarked even for Lunar City. Most of them cowered in their chairs, hiding their eyes. They were the simple cases of hysteria. But the richest girl on Earth, who'd had five husbands and believed that nothing could move her—she went into catatonic withdrawal and neither saw nor heard nor moved. Two other passengers sobbed in improvised strait jackets. The first shipload started home. Fast.

The second luxury liner took off with only four passengers and turned back before reaching the Moon. Space-pilots could take the strain of space-flight because they had work to do. Workers for the lunar mines could make the trip under heavy sedation. But it was too early in the development of space-travel for pleasure-passengers. They weren't prepared for the more humbling facts of life.

Pop heard of the quaint commercial enterprise through the micro-tapes put off at the shack for the men down in the mine. Sattell probably learned of it the same way. Pop didn't even think of it again. It seemed to have nothing to do with him. But Sattell undoubtedly dealt with it fully in his desperate writings back to Earth.

Pop matter-of-factly tended the shack and the landing field and the stores for the Big Crack mine. Between-times he made more drawings in pursuit of his own private objective. Quite accidentally, he developed a certain talent professional artists might have approved. But he was not trying to communicate, but to discover. Drawing—especially with his mind on Sattell—he found fresh in-

cidents popping up in his recollection. Times when he was happy. One day he remembered the puppy his children had owned and loved. He drew it painstakingly—and it was his again. Thereafter he could remember it any time he chose. He did actually recover a completely vanished past.

He envisioned a way to increase that recovery. But there was a marked shortage of artists' materials on the Moon. All freight had to be hauled from Earth, on a voyage equal to rather more than a thousand times around the equator of the Earth. Artists' supplies were not often included. Pop didn't even ask.

He began to explore the area outside the shack for possible material no one would think of sending from Earth. He collected stones of various sorts, but when warmed up in the shack they were useless. He found no strictly lunar material which would serve for modeling or carving portraits in the ground. He found minerals which could be pulverized and used as pigments, but nothing suitable for this new adventure in the recovery of lost youth. He even considered blasting, to aid his search. He could. Down in the mine, blasting was done by soaking carbon black—from CO_2 in liquid oxygen, and then firing it with a spark. It exploded splendidly. And its fumes were merely more CO_2 which an air-apparatus handled easily.

He didn't do any blasting. He didn't find any signs of the sort of mineral he required. Marble would have been perfect, but there is no marble on the Moon. Naturally! Yet Pop continued to search absorbedly for material with which to capture memory. Sattell still seemed necessary, but—

Early one lunar morning he was a good two miles from his shack when he saw rocket-fumes in the sky. It was most unlikely. He wasn't looking for anything of the sort, but out of the corner of his eye he observed that something moved. Which was impossible. He turned his head, and there were rocket-fumes coming over the horizon, not in the direction of Lunar City. Which was more impossible still.

He stared. A tiny silver rocket to the westward poured out monstrous masses of vapor. It decelerated swiftly. It curved downward. The rockets checked for an instant, and flamed again more violently, and checked once more. This was not an expert approach. It was a faulty one. Curving surface-ward in a sharply changing parabola, the pilot over-corrected and had to wait to gather downspeed, and then over-corrected again. It was an altogether clumsy landing. The ship was not even perfectly vertical when it settled not quite in the landing-area marked by silvery triangles. One of its tail-fins crumpled slightly. It tilted a little when fully landed.

Then nothing happened.

Pop made his way toward it in the skittering, skating gait one uses in one-sixth gravity. When he was within half a mile, an air-lock door

opened in the ship's side. But nothing came out of the lock. No space-suited figure. No cargo came drifting down with the singular deliberation of falling objects on the Moon.

It was just barely past lunar sunrise on the far side of the Moon. Incredibly long and utterly black shadows stretched across the plain, and half the rocketship was dazzling white and half was blacker than blackness itself. The sun still hung low indeed in the black, star-speckled sky. Pop waded through moondust, raising a trail of slowly settling powder. He knew only that the ship didn't come from Lunar City, but from Earth. He couldn't imagine why. He did not even wildly connect it with what—say—Sattell might have written with desperate plausibility about greasy-seeming white crystals out of the mine, knocking about Pop Young's shack in canisters containing a hundred Earth-pounds weight of richness.

Pop reached the rocketship. He approached the big tail-fins. On one of them there were welded ladder-rungs going up to the opened air-lock door.

He climbed.

The air-lock was perfectly normal when he reached it. There was a glass port in the inner door, and he saw eyes looking through it at him. He pulled the outer door shut and felt the whining vibration of admitted air. His vacuum suit went slack about him. The inner door began to open, and Pop reached up and gave

his helmet the practiced twisting jerk which removed it.

Then he blinked. There was a red-headed man in the opened door. He grinned savagely at Pop. He held a very nasty hand-weapon trained on Pop's middle.

"Don't come in!" he said mockingly. "And I don't give a damn about how you are. This isn't social. It's business!"

Pop simply gaped. He couldn't quite take it in.

"This," snapped the red-headed man abruptly, "is a stickup!"

Pop's eyes went through the inner lock-door. He saw that the interior of the ship was stripped and bare. But a spiral stairway descended from some upper compartment. It had a handrail of pure, transparent, water-clear plastic. The walls were bare insulation, but that trace of luxury remained. Pop gazed at the plastic, fascinated.

The red-headed man leaned forward, snarling. He slashed Pop across the face with the barrel of his weapon. It drew blood. It was wanton, savage brutality.

"Pay attention!" snarled the red-headed man. "A stickup, I said! Get it? You go get that can of stuff from the mine! The diamonds! Bring them here! Understand?"

Pop said numbly: "What the hell?"

The red-headed man hit him again. He was nerve-racked, and, therefore, he wanted to hurt.

"Move!" he rasped. "I want the diamonds you've got for the ship from Lunar City! Bring 'em!" Pop licked blood from his lips and the man with the weapon raged at him. "Then phone down to the mine! Tell Sattell I'm here and he can come on up! Tell him to bring any more diamonds they've dug up since the stuff you've got!"

He leaned forward. His face was only inches from Pop Young's. It was seamed and hard-bitten and nerve-racked. But any man would be quivering if he wasn't used to space or the feel of one-sixth gravity on the Moon. He panted:

"And get it straight! You try any tricks and we take off! We swing over your shack! The rocket-blast smashes it! We burn you down! Then we swing over the cable down to the mine and the rocket-flame melts it! You die and everybody in the mine besides! No tricks! We didn't come here for nothing!"

He twitched all over. Then he struck cruelly again at Pop Young's face. He seemed filled with fury, at least partly hysterical. It was the tension that space-travel—then, at its beginning—produced. It was meaningless savagery due to terror. But, of course, Pop was helpless to resent it. There were no weapons on the Moon and the mention of Sattell's name showed the uselessness of bluff. He'd pictured the complete set-up by the edge of the Big Crack. Pop could do nothing.

The red-headed man checked himself, panting. He drew back and slammed the inner lock-door. There was the sound of pumping.

Pop put his helmet back on and sealed it. The outer door opened. Outrushing air tugged at Pop. After a second or two he went out and climbed down the welded-on ladder-bars to the ground.

He headed back toward his shack. Somehow, the mention of Sattell had made his mind work better. It always did. He began painstakingly to put things together. The red-headed man knew the routine here in every detail. He knew Sattell. That part was simple. Sattell had planned this multi-million-dollar coup, as a man in prison might plan his break. The stripped interior of the ship identified it.

It was one of the unsuccessful luxury-liners sold for scrap. Or perhaps it was stolen for the journey here. Sattell's associates had had to steal or somehow get the fuel, and somchow find a pilot. But there were diamonds worth at least five million dollars waiting for them, and the whole job might not have called for more than two men—with Sattell as a third. According to the economics of crime, it was feasible. Anyhow it was being done.

Pop reached the dust-heap which was his shack and went in the air lock. Inside, he went to the vision-phone and called the mine-colony down in the Crack. He gave the message he'd been told to pass on. Sattell to come up, with what diamonds had been dug since the regular cannister was sent up for the Lunar City ship that would be due presently. Otherwise the ship on the landing strip would destroy shack and Pop and the colony together.

"I'd guess," said Pop painstakingly, "that Sattell figured it out. He's probably got some sort of gun to keep you from holding him down there. But he won't know his friends are here—not right this minute he won't."

A shaking voice asked questions from the vision-phone.

"No," said Pop, "they'll do it anyhow. If we were able to tell about 'em, they'd be chased. But if I'm dead and the shacks smashed and the cable burnt through, they'll be back on Earth long before a new cable's been got and let down to you. So they'll do all they can no matter what I do." He added, "I wouldn't tell Sattell a thing about it, if I were you. It'll save trouble. Just let him keep on waiting for this to happen. It'll save you trouble."

Another shaky question.

"Me?" asked Pop. "Oh, I'm going to raise what hell I can. There's some stuff in that ship I want."

He switched off the phone. He went over to his air apparatus. He took down the cannister of diamonds which were worth five millions or more back on Earth. He found a bucket. He dumped the diamonds casually into it. They floated downward with great deliberation and surged from side to side like a liquid when they stopped. One-sixth gravity.

Pop regarded his drawings meditatively. A sketch of his wife as he now remembered her. It was very

good to remember. A drawing of his two children, playing together. He looked forward to remembering much more about them. He grinned.

"That stair-rail," he said in deep satisfaction. "That'll do it!"

He tore bed linen from his bunk and worked on the emptied cannister. It was a double container with a thermware interior lining. Even on Earth newly-mined diamonds sometimes fly to pieces from internal stress. On the Moon, it was not desirable that diamonds be exposed to repeated violent changes of temperature. So a thermware-lined cannister kept them at mine-temperature once they were warmed to touchability.

Pop packed the cotton cloth in the container. He hurried a little, because the men in the rocket were shaky and might not practice patience. He took a small emergency-lamp from his spare spacesuit. He carefully cracked its bulb, exposing the filament within. He put the lamp on top of the cotton and sprinkled magnesium marking-powder over everything. Then he went to the air-apparatus and took out a flask of the liquid oxygen used to keep his breathing-air in balance. He poured the frigid, pale-blue stuff into the cotton. He saturated it.

All the inside of the shack was foggy when he finished. Then he pushed the cannister-top down. He breathed a sigh of relief when it was in place. He'd arranged for it to break a frozen-brittle switch as it descended. When it came off, the switch would light the lamp with its bare filament. There was powdered magnesium in contact with it and liquid oxygen all about.

He went out of the shack by the air lock. On the way, thinking about Sattell, he suddenly recovered a completely new memory. On their first wedding anniversary, so long ago, he and his wife had gone out to dinner to celebrate. He remembered how she looked: the almost-smug joy they shared that they would be together for always, with one complete year for proof.

Pop reflected hungrily that it was something else to be made permanent and inspected from time to time. But he wanted more than a drawing of this! He wanted to make the memory permanent and to extend it—

If it had not been for his vacuum suit and the cannister he carried, Pop would have rubbed his hands.

Tall, jagged crater-walls rose from the lunar plain. Monstrous, extended inky shadows stretched enormous distances, utterly black. The sun, like a glowing octopod, floated low at the edge of things and seemed to hate all creation.

Pop reached the rocket. He climbed the welded ladder-rungs to the air lock. He closed the door. Air whined. His suit sagged against his body. He took off his helmet.

When the red-headed man opened the inner door, the hand-weapon shook and trembled. Pop said calmly:

"Now I've got to go handle the hoist, if Sattell's coming up from

the mine. If I don't do it, he don't come up."

The red-headed man snarled. But his eyes were on the cannister whose contents should weigh a hundred pounds on Earth.

"Any tricks," he rasped, "and you know what happens!"

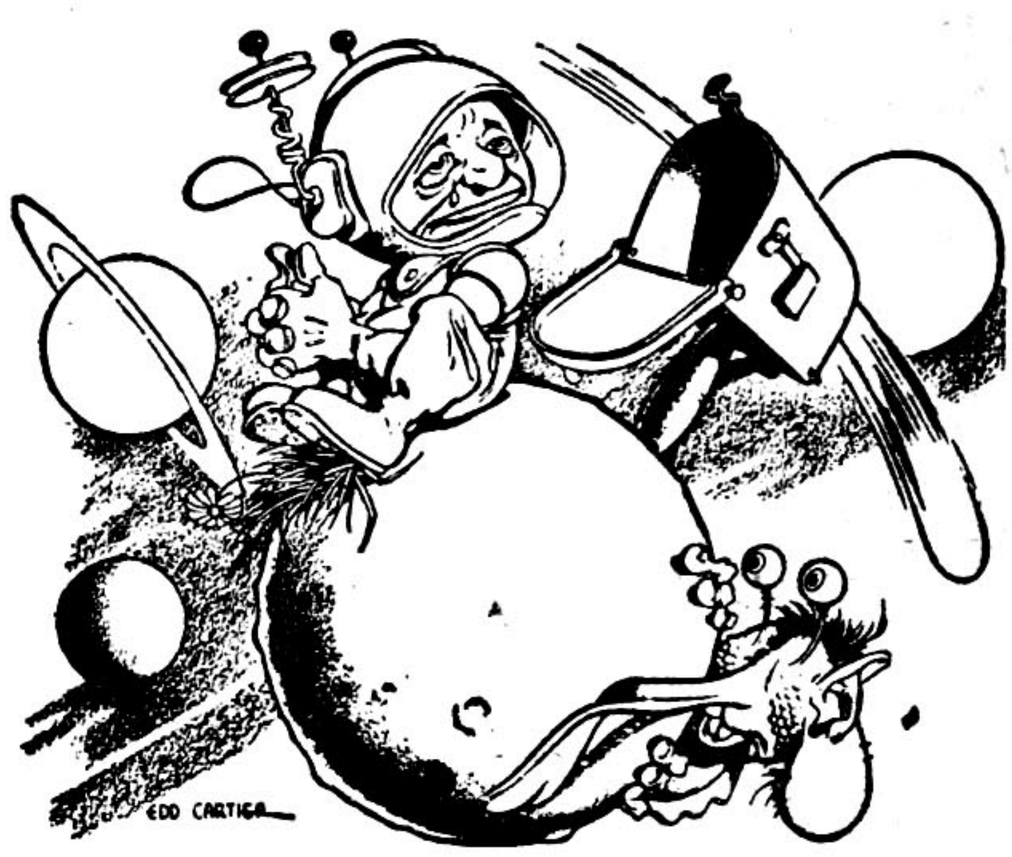
"Yeah," said Pop.

He stolidly put his helmet back on. But his eyes went past the red-headed man to the stair that wound down, inside the ship, from some compartment above. The stair-rail was pure, clear, water-white plastic, not less than three inches thick. There was a lot of it!

The inner door closed. Pop opened the outer. Air rushed out. He climbed painstakingly down to the ground. He started back toward the shack.

There was the most luridly bright of all possible flashes. There was no sound, of course. But something flamed very brightly, and the ground thumped under Pop Young's vacuum boots. He turned.

The rocketship was still in the act of flying apart. It had been a splendid explosion. Of course cotton sheeting in liquid oxygen is not quite as good an explosive as carbon-black, which they used down in the mine. Even with magnesium powder to start the flame when a bare light-filament ignited it, the cannister-bomb hadn't equaled—say—T.N.T. But the ship had fuel on board for the trip back to Earth. And it blew, too. It would be minutes before all the fragments of the ship returned



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to the Moon's surface. On the Moon, things fall slowly.

Pop didn't wait. He searched hopefully. Once a mass of steel plating fell only yards from him, but it did not interrupt his search.

When he went into the shack, he grinned to himself. The call-light of the vision-phone flickered wildly. When he took off his helmet the bell clanged incessantly. He answered. A shaking voice from the mining-colony panted:

"We felt a shock! What happened? What do we do?"

"Don't do a thing," advised Pop. "It's all right. I blew up the ship and everything's all right. I wouldn't even mention it to Sattell if I were you."

He grinned happily down at a section of plastic stair-rail he'd found not too far from where the ship exploded. When the man down in the mine cut off, Pop got out of his vacuum suit in a hurry. He placed the plastic zestfully on the table where he'd been restricted to drawing pictures of his wife and children in order to recover memories of them.

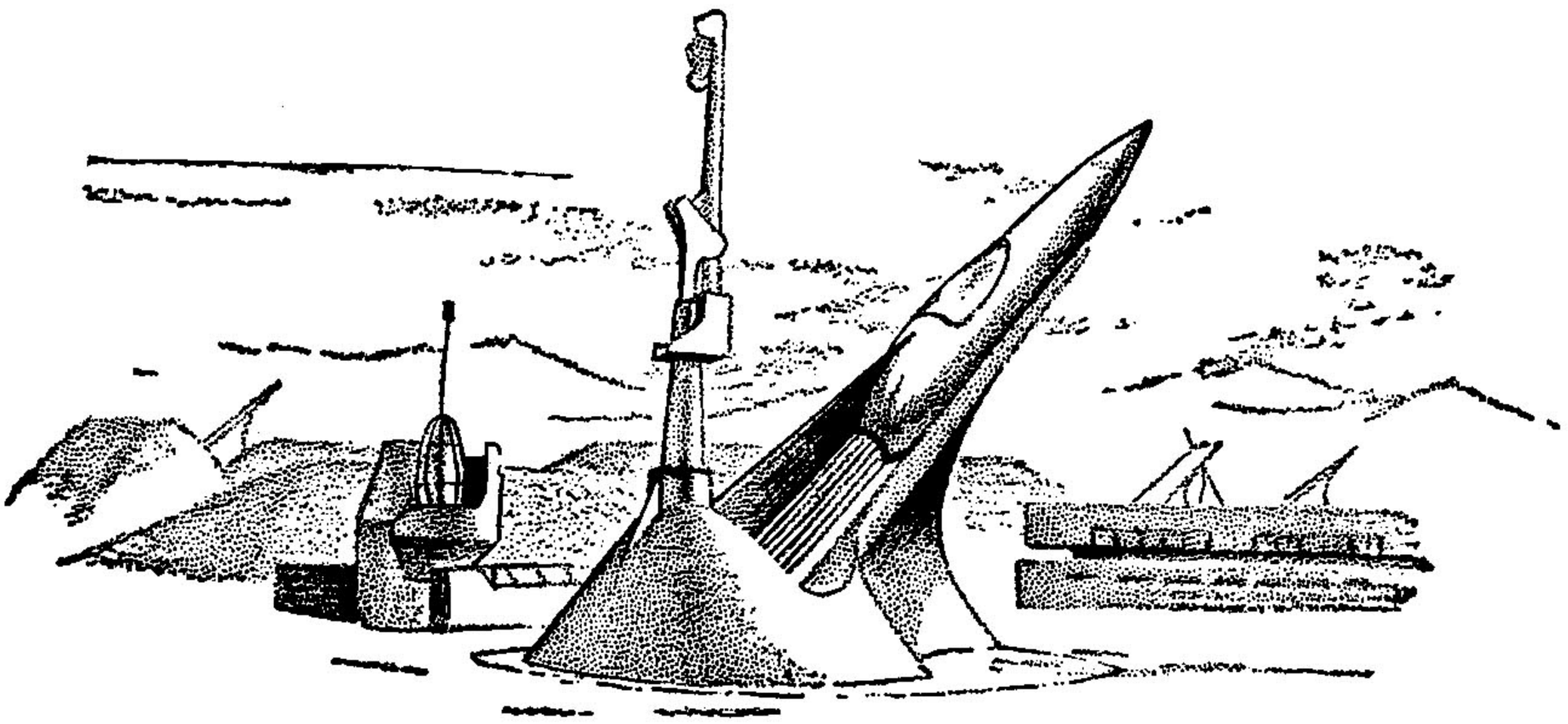
He began to plan, gloatingly, the thing he would carve out of a four-inch section of the plastic. When it was carved, he'd paint it. While he worked, he'd think of Sattell, because that was the way to get back the missing portions of his life—the parts Sattell had managed to get away from him. He'd get back more than ever, now!

He didn't wonder what he'd do if he ever remembered the crime Sattell had committed. He felt, somehow, that he wouldn't get that back until he'd recovered all the rest.

Gloating, it was amusing to remember what people used to call such art-works as he planned, when carved by other lonely men in other faraway places. They called those sculptures scrimshaw.

But they were a lot more than that!

THE END



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BY P. SCHUYLER MILLER

FRIEND IN COURT

I don't know what lot of book-buyers are expected to put down $2.50 for Basil Davenport's little study, "Inquiry into Science Fiction" (Longmans, Green & Co., New York, London & Toronto, 87 pp.) but perhaps some of you will listen to Dirce Archer, president of the Pittsburgh Science Fiction Association (who did the round-up of British s-f for us last year). Her reaction: "It should be required reading for every fan's family."

Basil Davenport is about as understanding a critic of the science-fiction-fantasy field as you'll find in "mature" literary circles. He has done two collections of retold ghost stories, and whenever he's tapped for a review you can be sure it will be fair. This study is in the mood of the literary essays you used to find in the highbrow magazines, and I suppose the bulk of the edition will go into libraries. It is to be hoped some of the librarians will read it, and try some of Mr. Davenport's suggested reading-list instead of buying blindly anything with "Space" in the title and passing up the really mature books of science fiction.

After briefly assessing the contri-

butions of Verne, Wells and Hugo Gernsback—did you see *his* story in the May *Esquire?*—Mr. Davenport goes on to explain the main categories of science fiction as he sees them: the space opera, mad scientist, BEM school; the scientific science fiction like "Mission of Gravity"; and the speculative school which is still growing and maturing. "The difference between science fiction and other comparable types of light reading, such as Westerns and detective stories, is that when the interest in the latter is outgrown they have nothing beyond to offer; whereas the reader of space operas, who usually begins young, is likely as he matures to be led on to the more intelligent types of science fiction, which deal with scientific problems and with social and even philosophical ideas," he points out. Not news to us, perhaps, but those bewildered families Dirce has in mind will take from Basil Davenport a judgment they won't accept from us.

Since the stories we remember longest are usually those which aroused us emotionally, and since Basil Davenport is a collector and student of ghost stories as well as of science fiction, you will find an excellent appraisal of the relationship of science fiction to fantasy in the chapter, "Science Fiction and the Emotions." Here he hits at one of our real weaknesses—that is, a weak spot in *modern* science fiction (for this is no turning of old turf). "It does seem," Mr. Davenport says wistfully, "as if science fiction ought to be able to produce a hero with as much personality as, for instance, Rex Stout's Archie Goodwin."

After you've bought this book to slip into your mother-in-law's Christmas stocking, have a look at the last chapter, on the future of science fiction. I know it's a good chapter, because I agree with just about everything in it. Introduction after introduction to anthology after anthology has had a go at assessing the significance of science fiction for our times. It seems to me that this chapter of "Inquiry into Science Fiction" just about ties off that vein. Some genius among editors will have to find another theme for introductions.

One source of confusion to the public has been the relation of science fiction to the crackpot borderland of science which harbors the Atlantis enthusiasts, the occultists, the followers of Velikovsky, and the flying-saucers-are-from-Mars — Venus, the Moon, or Outer Space—enthusiasts. Personally, I think the kind of fan who prefers this magazine and its two or three closest cognates is more critical of such things than the man in the street. I know doggone well that science fiction fandom didn't put "Worlds in Collision" on the best-seller lists: the people I saw buying it were old ladies with a fundamentalist gleam in their eyes. But I'd like to recommend another little book which shows how a hoax can stir the entire scientific world, pass on into orthodox acceptance, and finally be upset by better science.

The book is "The Piltdown Forgery," by J. S. Weiner (Oxford University Press, New York, London & Toronto. 1955. 214 + xii pp. Ill. $3.50), and it is as fascinating a scientific detective story as I've seen, told by the man who first scented an outright fake, and who then looked for and found the evidence which spells out every step right up to the last—the identity of the forger. The result is much like one of Roy Vickers' "Department of Dead Ends" detective stories, in which you can watch the masterful construction of a crime, then the steps which bring the whole structure down in a heap.

What it amounts to is that in 1912, public interest in Darwin's "Descent of Man" demanded that someone find a "missing link" which would be half man and half ape. Someone obligingly manufactured one — Piltdown man—and very deftly supplemented the first scraps of "evidence" with others of just the right kind, advanced at just the right time and in the right order to convince a majority of the world's leading authorities on paleontology and anthropology that in Piltdown man they had, indeed, a half-million-year old man with a modern braincase and an ape's jaw.

It wasn't easy, and the forger was a better psychologist than he was a counterfeiter, as it now appears. But forty years ago little or nothing was known about fossil men, and very little about their archeology. The men, like Arthur Smith Woodward, who became the principal champions of Piltdown man's authenticity were paleontologists whose eminence had been earned in the field of fossil reptiles, and who had been permitted to "find" some of the Piltdown relics themselves. They were allowed to predict what the missing canine tooth must look like, even to making a plaster reconstruction — then the forger whittled an orang-outang canine to look exactly like the plaster one. Naturally the pundits were elated to have their genius so definitely confirmed.

The Piltdown forgery didn't fool everybody. Many scientists objected to its authenticity for reasons which are as good today as they were in 1912. But there were very few real human fossils for comparison. There were no generally accepted standards of excavation. And there was the tendency that's still with us, for an expert in one field to consider himself an expert in all fields. The chemical test with which Dr. Kenneth Oakley first proved that the Piltdown remains were no more than fifty thousand years old—rather than ten times that age—had been used effectively as far back as 1892, but when Oakley made his first Piltdown analysis, in 1949, it was still not sensitive enough to reveal the difference between the skull fragments — which may date back to the Ice Age, and may even have come from the Piltdown gravel pit before someone began to improve on them with chemical stains—and the ape's jaw, which is fresh bone. When he repeated the tests in 1953, the techniques of fluorine analysis

had improved to the point where the difference did show clearly.

By the same token, we may very well not yet have arrived at a stage in our scientific knowledge where we can evaluate the soundness or unsoundness of such investigations as are being made by Roger W. Babson's Gravity Research Foundation up in New Boston, New Hampshire. Reaction to the Foundation and its activities seems to oscillate between complete acceptance in a "here's a gang of *real* scientists who are going to show up all those educated fools" mood, and complete ridicule. When I heard that there was an annual $1000 award for the best essay on gravity, I wondered what could possibly win or whether—as, after all, has often been the case with the Pulitzer Prizes in literature—they had had to rule that nothing qualified.

Not only has the $1000 award been made every year beginning with 1949, additional awards of from $50 to $500 have been made each year—seven of them in 1951. The winning essays for the first five years are published in a pamphlet which you can get, free, from the Foundation, and the others may be borrowed. They are, by the way, assembling a reference library of information on gravity for the use of any serious student. And whatever their present or ultimate scientific value may be, these are definitely not just tongue-in-cheek attempts to butter up Mr. Babson and get some of his money. To me—no expert—the worth of these first five seems to vary pretty widely, and I'm not sure I'd pay out $1000 for all of them put together. They may be uncritical, but they seem to be serious and sincere.

Anthropology went on from the Piltdown days to work out better techniques for gathering and evaluating evidence, to look for more facts, and to fit them into a consistent picture of the evolution of Man and his societies. Science may go on from these elementary Gravity Research essays to develop experimental techniques, uncover phenomena, and erect a comprehensive theory of gravity that can be tested and put to use. I don't think we can judge, now, any more than people in 1912 could evaluate the Piltdown skull, or the professors of literature can tell now what the future of science fiction will be.

TIMELINER, by Charles Eric Maine. Rinehart & Co., New York. 1955. 249 pp. $2.75

This novel by a British author, whose previously published s-f novel I haven't seen, is based on a BBC radio script. He has also scripted a British film, "Spaceways," which hasn't come my way.

Physicist Hugh Macklin is testing the "dimensional quadrature" capsule which he hopes will rotate his time-sense in such a way that he can experience past or future. A rival for his wife's favors throws on full power, Macklin's body dies, but his

personality takes over the body of Eddie Rayner, lunar miner, seventy-six years later. When Rayner dies, Macklin becomes Ernest Tehn, suspected spy in the technocracy on Venus after Earth has annihilated itself. Here he undergoes some very complicated maneuvering, both plotwise and identity-wise, before plunging on into an interstellar war thousands of years in the future. And now, he finds, "timeliners" like himself are well known—and are destroyed as murderers to restore the personalities they have displaced. Yet Macklin does, in the end, get back to his own time and to a surprise . . .

This doesn't have the intensity that Van Vogt might have given to such a plot. On the other hand, it's well beyond the elementary, matter-of-fact treatment we get from some British writers. The scenes are vivid—radio and TV training showing up, I suppose—but Macklin isn't a very sympathetic protagonist. He lets things happen to him, instead of digging in his heels and directing his own fate. Might have been good enough once, but it doesn't quite meet current standards.

SNOW FURY, by Richard Cort Holden. Dodd, Mead & Co., New York. 1955. 248 pp. $3.00

Here is a top-notch scientific mystery of the kind John Taine long ago adopted as his own particular *forte*. A series of horrible, mysterious incidents occur: a boy's snowball grows, a flock of chickens are killed, an old man and his dog are dead and desiccated in the midst of a trackless patch of snow—and all the while the unseasonable, inexplicable "dry" snow falls grimly over the town of Cainfield, New Hampshire. Country reporter David Storm, cloud-seeding biochemist Nathan Cruickshank, and the Professor's pretty daughter are in the midst of the puzzle from the start, and little by little the mystery grows as the local authorities follow the trail of the snow that blows against the wind, the part-eaten field mice, the gnawed saplings, and the eerie glow on Barker Mountain.

The people and New England setting are convincing and the mystery beautifully built up, but the end falls rather flat with some clumsy pseudo-scientific explanation no worse, but less convincing, than that in more typical science fiction. And either the author made a nonsensical chemical boner in the very key point of his gimmick, or the publisher didn't let him read proof on the last twenty-five pages. Maybe it won't spoil a superior story for you, but it let me down with a thunk.

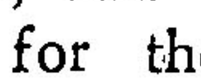
THE EXPLORATION OF THE MOON, by Arthur C. Clarke & R. A. Smith. Harper & Brothers, New York. 1955. 112 pp. Ill. $2.50.

It is an understatement to say this book is "illustrated." It's a picture-book of forty-five full-page plates by

Ralph A. Smith, currently a British rocket designer, with accompanying text by our old friend Arthur C. Clarke. In fact, it could almost be considered a book of plates for Clarke's recent novel "Earthlight."

Step by step and plate by plate we watch a satellite rocket built and launched into an orbit, a personnel rocket following, spacemen learning the ropes, tankers put into an orbit and a robot ship built, fueled and landed on the Moon. Then come the human pioneers to set up generators, prospect for buried air, burrow underground and establish a self-sustaining station and observatory. The colonists follow, and we see them at work and play, visualizing the background of "Earthlight" de-detail by detail. Finally a robot "probe" is sent to Mars.

They haven't the Bonestell photographic realism, and they aren't in color—except for the jacket—but these pictures come as close to spelling out in minute detail the first adventuring into space, as anything we've had. Maybe it's most like one of the old *Science and Invention* articles, with all the advantages of the author-illustrator team's practical, special knowledge of what today's rocketeers are doing and planning. Grand for the kids, too.



OF ALL POSSIBLE WORLDS, by William Tenn. Ballantine Books, New York. 1955. 161 pp. $2.00; paper, 35¢.

I don't know why William Tenn hasn't had a short story collection before; he is one of the more reliable of the post-war writers—reliable for variety as well as for quality, and one of the few writers to handle humor deftly.

This Ballantine selection doesn't include any masterpieces, and as might be expected leaves out some of the best of the Tenn yarns, which have already found a warm home in previous anthologies. But it's superior entertainment, and the opening story, "Down Among the Dead Men," succeeds in threading a human feeling through a grisly theme, making this the most memorable of the seven stories in the book.

Five of the seven are science fiction: two are good fantasy. In "Me, Myself, and I" we have a paradoxical comedy of the man who goes back in time and meets himself going back in time . . . In "Flirgle-flip," a specialist from the far future—he flips flirgles—makes a spectacle of himself in our time. "The Liberation of Earth" is a wry parallel to our own times, galactic scale, and "The Custodian" is a very nicely done portrait of the last man on Earth, forced to clamber down out of his worldwide ivory tower.

Both fantasies are comedies in the old *Unknown* manner: "Everyone Loves Irving Bommer" describes the gypsy's gift better than anyone else can, and "The Tenants" is a story of the very peculiar pair who rent the thirteenth floor of an office building that doesn't have one—and pro-

ceed to move in and do business there.

THE TREASURY OF SCIENCE FICTION CLASSICS, edited by Harold W. Kuebler. Hanover House, Garden City. 1955. 694 pp. $2.95.

I don't for the life of me, know who this anthology is for, except that the editor says its purpose "is to give the newer generation of readers an opportunity to sample a few of the great classics that form the foundation upon which modern science fiction is built. August Derleth has covered that ground pretty thoroughly, but maybe his collections have been worn out by now and the libraries need something new and respectable.

You do get a lot for your money here, and what you get is good, if overly familiar. Three out of the seventeen items in the book may be new to you: Poe's "Conversation of Eiros and Charmion," describing the destruction of Earth by a comet —and too unreadable to have been reprinted in the old *Amazing Stories,* which dug out just about everything else of Poe's—E. M. Forster's classic "The Machine Stops," and "The Curious Case of Benjamin Button" by none other than F. Scott Fitzgerald, the beautifully comic tale of the child who was born old.

You get, complete, three novels, though short ones: Arthur Conan Doyle's Atlantis tale, one of his last ones, "The Maracot Deep," Jules Verne's "Round the Moon"—which can be called "a little-known sequel" to "From the Earth to the Moon" only because it is usually included with it in one complete book—and H. G. Wells' "The Time Machine," which reads as well now as it always does. You get an abridgment of Garrett P. Serviss' stumbling, archaic sequel to "War of the Worlds," "Edison's Conquest of Mars," and why I don't know, when Serviss did better things—except that you first have the script of the Orson Welles broadcast of "War of the Worlds" by way of introduction. (Howard Koch gets due credit as its author.) You get, also, the complete play, "R.U.R." by Karel Capek, which gave us the word "robot."

In place of complete novelettes or more short stories, the editor has spanned time and added variety by taking excerpts from three landmark books, which I personally hold in about the same esteem as the condensed novels in *Readers' Digest*: from the Balmer and Wylie "When Worlds Collide" from Aldous Huxley's "Brave New World," and two from Stapledon's "Last and First Men."

Filling in the chinks between the longer items are Wells' "The Star," S. Fowler Wright's "The Rat," Ambrose Bierce's "The Damned Thing," and J. B. Priestley's "Mr. Strenberry's Tale"—which was copyrighted in 1953 and consequently cannot be called a classic or the foundation for anything. Presumably it is there

to show that "name" writers still write science fiction—we have no editorial comments on the stories, save in a brief introduction—but there are better choices.

Maybe the libraries will want it . . .

THE OTHER PLACE, by J. B. Priestley. Harper & Brothers, New York. 1955. 265 pp. $3.00.

Only a few of the short stories in this collection can be called science fiction: the rest are open-and-shut fantasy. The ones that qualify have that quality of thrown-away understatement that stands in diametric contrast to the fever-pitch of most mainline stories which we consider typical of modern s-f. Maybe a little hybridization would be good for the breed.

What we have are more variants on Priestley's preoccupation with mental time-travel, the ability to experience different parts of the four-dimensional continuum simultaneously. In "Look After the Strange Girl," a man and girl from the present find themselves deposited for a few hours in a house party of 1901. In "The Statues" a man gets brief glimpses of a future London, and in "Mr. Strenberry's Tale" another man meets a creature fleeing from horrors of the very far future. These last two are very much in the vein of some of H. G. Wells' short stories. Finally, "Night Sequence" can be taken either as another brief excursion into the past or as an encounter with two very pleasant ghosts. A fifth story, "The Grey Ones," is also on the borderline: its theme is the possession of mankind by aliens who may be taken either as invaders from elsewhere or semi-orthodox demons.

As for the rest of the book we have old familiar themes of fantasy, smoothly and competently but not very originally handled: "The Other Place" where everyone is happy; the "Guest of Honor" who finds his audience turned strange, as does the bureaucrat of "The Leadington Incident"; and finally a bit of low comedy with "Uncle Phil on TV," haunting the television set which was bought with his legacy.

They're casual, old-line, anecdotal incidents in the vein of the "Jorkens" yarns by Lord Dunsany. Some like some of 'em; some can't abide 'em.

HELL'S PAVEMENT, by Damon Knight. Lion Books, New York. 1955. 192 pp. Paper, 35¢.

"A madcap blonde and her reckless lover challenge a world of rollicking chaos" announces the jacket of this fast-moving Lion Science-Fantasy Novel. Forget that: it's a mere fragment of a darn good yarn about the nightmare world of 2134, which resulted when some do-gooders ruthlessly set out to eradicate antisocial behavior by giving each

person a guardian angel to warn him off from deviation.

The book is built up from the guardian angel situation, which you'll remember from these pages back in 1951, and the later story "Turncoat" in another magazine. Arthur Bass is a very Junior Assistant Salesman in one unimportant corner of General Products' commercial empire (in return for a year's free premiums part of the populace has been provided with "angels" which refuse to let them do anything but buy, buy, buy). He has no angel—and when he falls afoul of his society and takes off over the wall that hems him in, he finds himself in a maze of weird social fragments, plotters and counterplotters.

I don't suppose it has the uncomfortable reasonableness of "The Space Merchants," but that memorable book became unconvincing in its final stretches. Here's no masterpiece, but one of the better pieces of science-fictive entertainment out this year, and more worthy of hard covers than some we've had and will get.

WHO GOES THERE? by John W. Campbell, Jr. Dell Publishing Co., New York. 1955. 254 pp. 35¢.

This is *not* a paper-back reprint of the Shasta book of the same name; it's a selection of six of the best of your editor's classic short stories from both "Who Goes There?" and "Cloak of Aesir." The former is represented by the title story, "Twilight," "Night," and "Blindness"; the latter by the two Aesir stories, "Out of Night" and "Cloak of Aesir." I don't think I need tell you that these stories from 1932 to 1938, by "Don A. Stuart," are as good as anything being written today—and that today's best science fiction wouldn't have been written if these hadn't been done first, and showed the way. Theodore Sturgeon says it all much better than I can in an introduction: "these concepts were born on the horizon."

THE BODY SNATCHERS, by Jack Finney. Dell Publishing Co., New York. 1955. 191 pp. 25¢.

This expansion of last year's *Collier's* serial is a well done variant of the theme Heinlein used in his "Puppet Masters"—that an alien life form can take over the bodies and minds of mankind and win itself a new world.

Dr. Miles Bennell is one of the first to learn of a mass delusion in his town: that familiar friends and relatives are suddenly, indefinably someone else. Medically and psychiatrically the thing makes no sense, and presently his patients are coming sheepishly to him with the admission that they were mistaken. But in the meantime, in a basement corner, he has seen the incomplete "blank" for a friend . . . and shortly

afterward has watched another such blank growing into the shape of the girl who had first brought the problem to him.

From there on it's a straight chase yarn, with several nice gimmicks and a not entirely convincing denouement. The book won't win any prizes, but it does uphold the pretty high *Collier's* standard in science fiction and does nothing to let down Dell's.

A MAN OBSESSED, by Alan E. Nourse. THE LAST PLANET, by Andre Norton. Ace Books, Inc., New York. 1955. 127 + 192 pp. 35¢.

These Ace "Double Novels" are the top bargains in the paper-back field, even when the selections are only so-so. Here is a reprint of Andre Norton's excellent "Star Rangers"—under a new name, but unabridged—in which Rangers of several different races explore a far world and unravel its mysteries. With it is an original by Alan Nourse. He's done much better elsewhere, but it is a good job, getting better as it goes along. Jeff Meyer, obsessed with the drive to kill the man whom he has "seen" kill his father, follows the fugitive into the Hoffman Center for psycho-medical research. He volunteers his services as a guinea pig for unspecified research, but before testing begins, a series of strange happenings begin to cascade around him. What happens and why are, of course, the story. The medical background is as authentic as any projection two centuries into the future can be—the author may, by this time, have his M.D.

REPRINTS OF THE MONTH

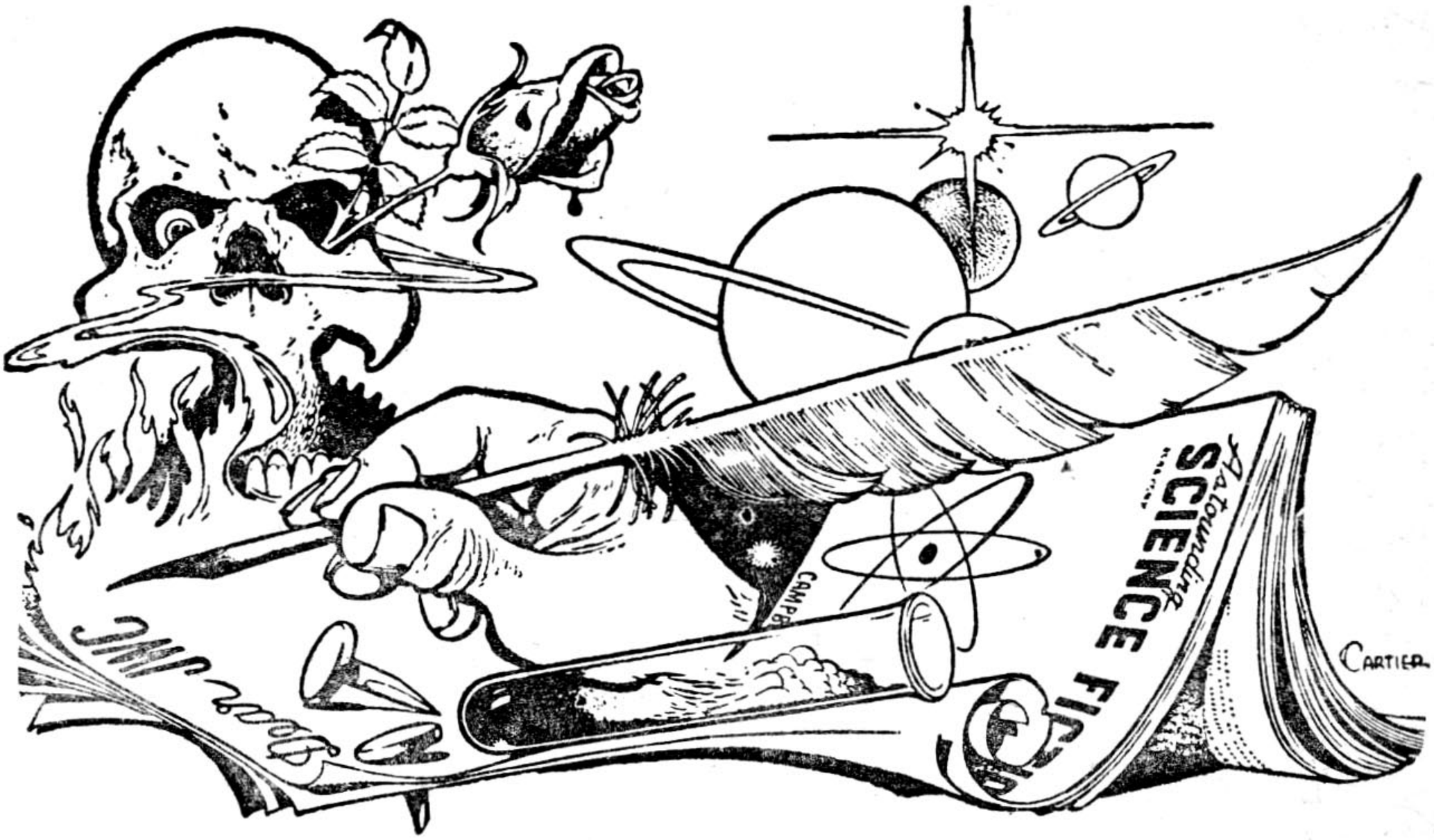
COSTIGAN'S NEEDLE, by Jerry Sohl (Bantam Books, 169 pp. 25¢). The doorway into—somewhere.

THE SYNDIC, by Cyril M. Kornbluth (Bantam, 142 pp. 25¢). A Twenty-first Century America in which organized crime has become organized government.

REVOLT IN 2100, by Robert A. Heinlein (Signet Books, 192 pp. 25¢). Third in the Shasta "Future History" series, now all Signet reprints.

UNDER THE SEA WIND, by Rachel L. Carson (Mentor Books, 157 pp. 35¢). An earlier science classic by the author of "The Sea Around Us": the sea and all its creatures.

THE END



BRASS TACKS

Dear John:

I am both dismayed and disgusted that Astounding Science Fiction should stoop so low as to publicize Paramount Pictures' "The Conquest of Space."

I am not objecting on the grounds that I don't want to see any more space-flight movies; I do want to see them made, because every little bit helps.

But I am objecting when somebody makes a movie which does more to hurt space flight than promote it.

The obvious mistakes in the picture comprise a list too long to enumerate. It is evident that no one stood up and screamed about it the way Bob Heinlein did for "Destination Moon"—which, I am happy to say, did not come close to losing it's enviable position as the classic space flight film in competition with the technicolor fantasy I'm talking about. What hurts us all is the fact that Willy Ley and Chesley Bonestell allowed their names to be connected with the film. To the layman and the young space-minded men of this country, the names of both of those men stand as authorities on space flight. But the film which they endorsed is certainly not authoritative in any sense of the word.

It was laughed at at White Sands. I laughed with everybody else, but I didn't get up and leave the way some of the others did because I kept

thinking, "It must get better, because it certainly can't get any worse!"

There are a number of us around White Sands—myself and Dr. R. K. Sherburne (who directs the Ford Foundation TV show "Frontier to Space") included—who believe the public should, within the bounds of military security, be told the most authoritative facts available. Only in this way can we show that space flight will not be the snap job the fantasy writers take for granted. Only by explaining correctly the problems we face can we tell them why we have not as yet solved them.

Half-correct facts, pure fantasy, garbled meanings— These cause me to say, "Willy, if you are the best expert on space flight that we can produce, we'll never make it past the ionosphere. After seeing that film, should we continue to believe what you say in your books?" The same goes for Bonestell. And to ASF, for devoting a cover and a photo feature to the film, I ask, "What are you publishing, a comic book?"

Both men made their reputations the hard way by sticking to facts. But now that they have arrived, I guess money talks.

James O'Hanlon, as a matter of interest, was the man who wrote the screen play for this farce; he was the same one who was brought in on "Destination Moon" to liven it up with sex, a chorus of hepsters, and dude ranches. I was lucky enough to see the manuscript of the "livened-up" version of "Destination Moon" that was never shot. "The Conquest of Space" contained most of the lovely little scenes that never got into the classic.

Sour grapes on my part? Maybe. But when I see what is being fed to the public these days as the real facts, I think some of the Hollywood boys should come down and get some New Mexico sand blown around them, Bonestell and Ley included. I will give praise where praise is due, and have done so in the past; but I also reserve the right to cut somebody low when they deserve it.

The kids of today that saw that movie have a rugged shock awaiting them in reality if they ever have to slide into the pilot's couch of a spaceship sometime in the future. —G. Harry Stine.

Willy tells me he paid only one visit to the studio, was not a technical consultant. He only wrote the book—which was not followed. My apologies and sincere sympathies to Willy Ley.

I had not had a chance to see the movie—and the stills were beautiful.

Dear Mr. Campbell:

Something in your April issue editorial caused me to roll out my typewriter for another letter. This was your query in the final paragraph as to whether what we need now are more amateur psionists.

About three years ago I began systematic research on the effects of

microwaves on the human mind and body, and by degrees (and pure chance), blundered into just this topic. I had read of Dr. Rhine's experiments, but as a trained engineer (B.S. and M.S.), was quite content to leave this ephemeral field to psychologists and psychic researchers. Indeed, I did not engage in the studies through my own choice, but through what seemed sheer survival necessity!

While exposed to certain electromagnetic radiation fields I noted such bizarre effects on both mind and body that I felt impelled to investigate them with a view to anticipating conditions possibly dangerous to both health and sanity. In doing this, discoveries were made which—even today—seem too fantastic for sober consideration. Out of these some were verifiable and reproducible. One of these was the actual experience of telepathy with a number of different individuals. I am now in a position to describe these phenomena, a theory for its causative factors and occurrence, and simple apparatus by means of which these phenomena can be duplicated and checked independently. It is quite possible and even probable, as in the case of Dr. Rhine's experiments, that certain individuals will be found who already possess the necessary mental equipment to a marked degree.

Even to those who already possess these faculties, the key to its recognition and control lies in a course of training and conditioning of the mind. It seems now, from the experimental evidence, that a majority of our population already possess these latent psi abilities, but do not recognize and use them. The reason for the existence of these telepathic faculties is the prolonged exposure of these segments of the population to a wide-band radio-frequency spectrum over a prolonged period of time. The reason for their inability to recognize and use them is not the inability to perceive these communications—rather it is lack of mental training which will enable them to discriminate and tune in one message to the exclusion of a very large amount of "noise." People who have not developed their telepathic powers to the recognition point, but still have developed them, will receive these messages in the part of the brain that is not consciously occupied—and often act hypnotically on them. Thus if they do not develop and use them, they may be seized temporarily by others and used for their own purposes. Thus it seems imperative—if we are on the verge of a telepathic age anyway—that people learn to recognize and use these faculties. Otherwise, of course, we may sacrifice by default a force potentially greater than the atom bomb to the first neo Genghis Khan who comes along.

Obviously results cannot be guaranteed to everyone at this time—but if sufficient interest is aroused in sincere and talented amateurs, it is likely that more than a few will be found who possess the necessary

basic equipment—namely in their headbone. The technical part is relatively easy—though of course not *a priori* obvious to one who has not (as I have) spent three years in intensive research. I propose an article to describe the basic theory to date, and one or two simple pieces of equipment which can be homemade by anyone with the time to spare. As for the rest, that requires a period of intensive directed study. These basic discoveries lay the foundations for further studies in a new field of mental science, which may be Man's crowning achievement. Our greatest problems today are social, psychological, and spiritual. They have not succumbed to the methods of physical science except in a few isolated instances. The foundations of Twentieth Century Science were built by sincere and talented amateurs, rather than "authorities" bogged down in orthodoxy. Such could be the case here.

Even though I have been employed full time as a structural engineer, I still found time for private investigations. Unless there are other workers in the field who can pool their knowledge however, I expect that little will come of it. (Incidentally I have so improved my own health and mental efficiency in the process, that even at the present stage of being three years, and several thousand dollars worth of equipment in the hole—I consider the effort worthwhile.) This is more than a parlor stunt—the development of telepathic faculties would give us a powerful new tool in mental science—one which could well be instrumental in solving some of our pressing problems.—T. O. Jothun.

If the phenomenon could be made reproducable enough for study—!

———

Dear Mr. Campbell:

Your editorial in the ASF of last September ("Breakthrough") was of extreme interest to me, because it has some points in common with an idea I've been playing with for the past year. I refer to your statement that there is one hundred per cent negative feedback in the Universe.

I agree with this and also propose that those properties of the Universe which seem to indicate that it is a "rigid" system are due to the feedback. Try to move a mass on a frictionless plane and you encounter a force which wasn't there until you tried to move it. Try to warp a projectile out of its orbit and the same thing happens. Every "permitted" state in the Universe is surrounded by an infinite number of "illegal" states. I propose that the reason things seem to favor the "permitted" states is that they "drift" into the "illegal" states, and are precipitated back into the "permitted" ones.

There's just one difficulty. This drifting in the continuum of possible states could only be infinitesimal (in the strict mathematical sense) be-

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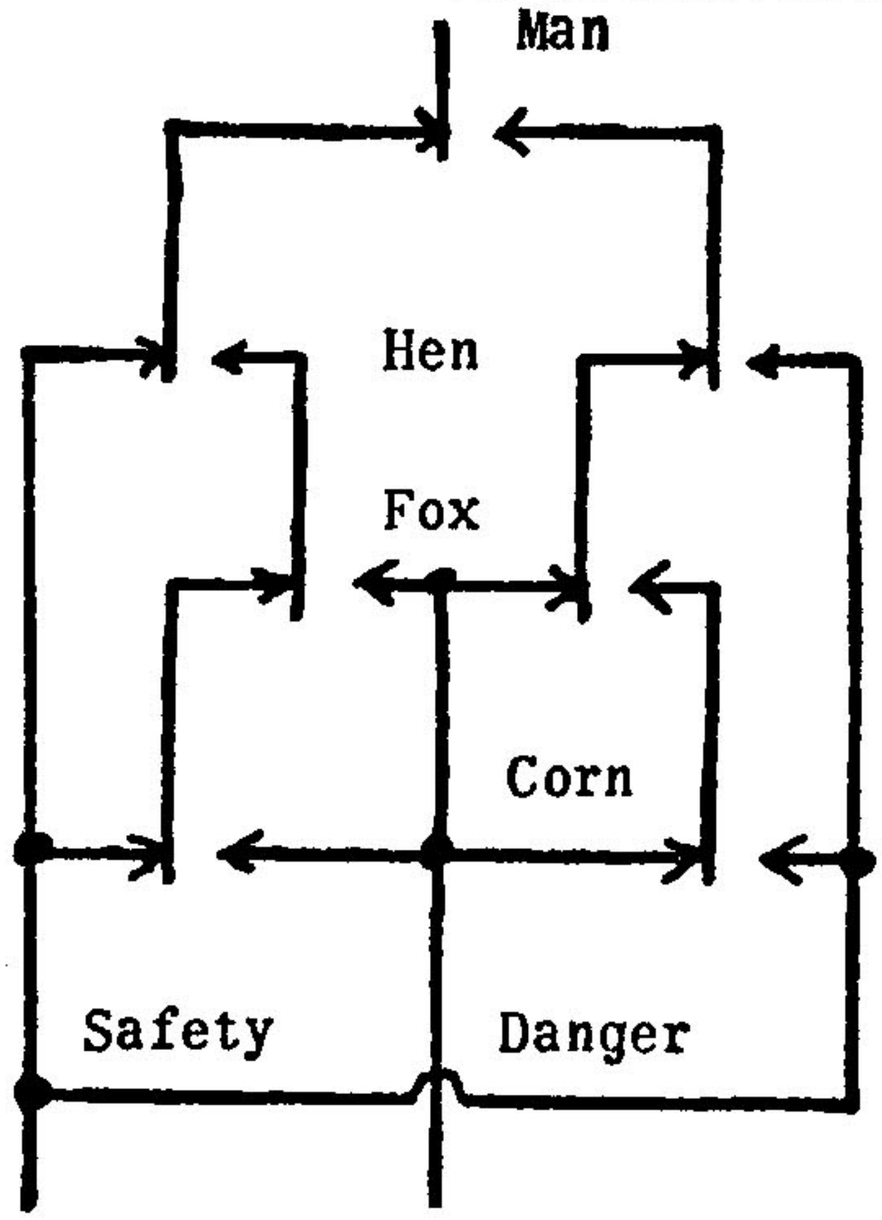

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PUBLICATIONS ON COMPUTERS, SYMBOLIC LOGIC

P 2D: THE COMPUTER DIRECTORY, 1955. 164 pages, 7500 Who's Who entries, 300 Organization entries, 600 entries of Products and Services for Sale in the Computer Field; 250,000 words of condensed, factual information about the computer field. June, 1955, issue of "Computers and Automation". **$4.00**

P 32: SYMBOLIC LOGIC, by LEWIS CARROLL. Reprint of "Symbolic Logic, Part I, Elementary," 4th edit., 1897, 240 pages, by Lewis Carroll (C. L. Dodgson). Contains Lewis Carroll's inimitable and entertaining problems in symbolic logic, his method of solution (now partly out of date), and his sketches of Parts II and III, which he never wrote since he died in 1898. ..... **$2.50**

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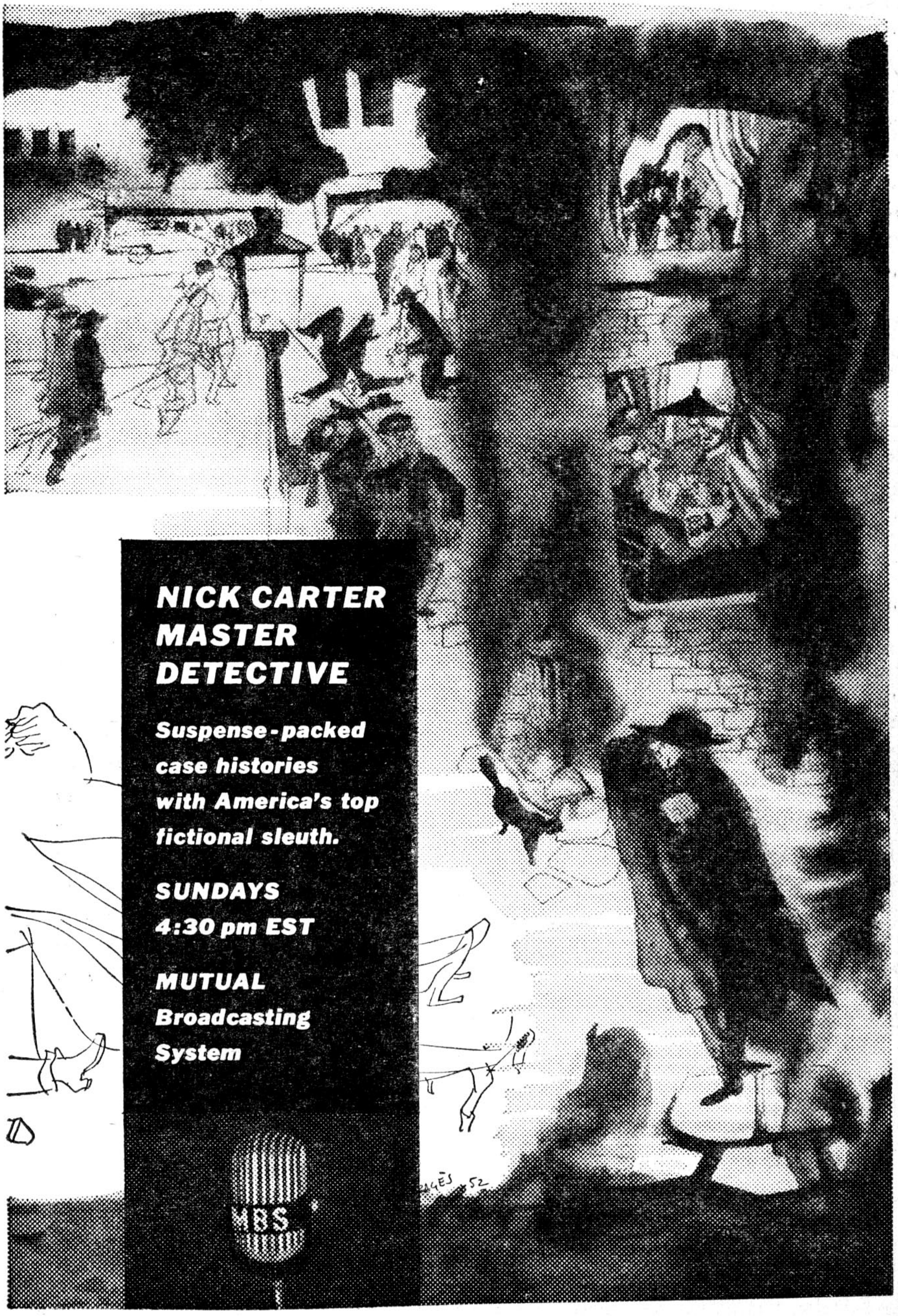
cause only an infinitesimal unbalancing of forces would be necessary to correct the drift. There would be a type of oscillation as there is inherent in all feedback systems, but too small to be operationally detectible; in fact with infinitesimal amplitude and period and infinite frequency. And here's the difficulty: the action integral for these oscillations would be infinitesimal also, and quantum theory tells us that this is impossible, that the smallest amount of action is the quantum, h. And if the action was a finite value, h, then the oscillation would be finite and detectible also. In fact, the period would have to equal h/Energy. And since the frequency is just the reciprocal of the period, it would be, f=E/h, or, as Planck put it fifty years ago, E=hf. And just substitute mc^2 for E if you are talking about a particle, and you can work right to de Broglie's equations.

Yes, there certainly is negative feedback in the Universe, although the opposing signal is never instantaneous because of the quantum of action. And this lag is the source of all that puzzling oscillation. We should have suspected that there was one hundred per cent negative feedback in the Universe even before we heard of the de Broglie waves, because the Universe seemed to be a rigid structure and you can't make a rigid structure without employing feedback. Even two pieces of metal bolted together involve feedback; no force pushes them together until you try to pull them apart. And we surely should have suspected it after we discovered that particles sometimes behaved like waves, because you can't make a system oscillate without using feedback, from the simplest electric buzzer to the most complex R.F. generator.

You can understand from this why I was more than usually interested in your editorial, but I just can't see how, even in theory, you can make the feedback positive. I would like to hear more about this and also your reactions to what I have said above. —George J. O'Toole.

For feedback, there must be two separate circuits—one forward and one back. And neither can be of the type represented by the stabilized phenomenon. Thus electronic *circuits can stabilize much lower frequency* sound *systems. What's the feedback system itself, then, if de Broglie waves are its output?*

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★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(*Continued from page 7*)

When we get to dice, we have a pure-luck game—unless there is an illegal concealed game underlying it, such as iron slugs under the six spots, and a powerful electromagnet under the table. It's an open game, in a sense—but allows of no manipulation by skill, intelligence, or wisdom. The fool has as great a chance to win as the wise and skillful man—if the fool knows only the simple routine of odds calculations.

Dice rather corresponds to the purely-hereditary-position type of culture. A man born a serf could not manipulate his position; the man born a noble was stuck with that. The Hindu culture has something of that in their caste system; a man born a Brahmin might genuinely like to be an agricultural botanist—but a Brahmin cannot be a farmer. The die is cast; he cannot manipulate his position. A genius born into a low caste must leave the game entirely if he wants to advance—he cannot use his genius to organize a great new industry, for example.

To the purely-hereditary-position culture, it is "unfair" to have secret abilities affect the outcome of the Game of Living; the "abilities" of the individual are fixed by his position-by-birth, and it is improper to introduce any unexpected variants by development after birth.

Our present culture is a concealed game; we draw a certain "hand" of abilities, but the way we use them is concealed. We're allowed privacy of action *that is effective* in altering the situation. The purely-hereditary culture allows the individual privacy of action—but no action can change his position. Ours allows privacy of action which *can* change an individual's position.

Given a technique or device which ends privacy of action, we'll have an Open Game culture. The situation at any instant will be known to all—but what the individual's mental abilities are will be concealed. If he has great creativity, he will be able to cause a change of position that was totally unexpected.

Now part of our present cultural attitude actually is that *new methods of use of abilities are illegitimate and unfair.* There's a sort of Aristotelian-

ism about the conception: a method of doing things is either approved-and-accepted, or it's illegal or unfair. The old saying that "Everything that's fun is either illegal, immoral, or fattening," is a slightly satiric reference to that real situation. The reaction to the use of gas in warfare is typical: why should it be outlawed?

At the first conference among nations considering outlawing gas, the United States was represented by an admiral; the other nations by generals. The admiral's attitude was, in essence, that if it were not immoral to drown a man in water, it didn't seem particularly immoral to drown him in gas. Since fire has been a weapon of war for millennia, the use of flame-throwers that burn human beings like celluloid toys isn't considered particularly frightful, but gas is. The vast fire-storms generated by fire-bombs used in World War II were not viewed with any great alarm—the atomic fireball that appeared over Hiroshima was.

It isn't that the result is particularly different—it's just that, in the present cultural system, a new method of obtaining results is "unfair." It's "unfair" because it is not familiar—i.e., because it was not part of the *open* game.

The present culture, in other words, insists that information on heredity be open. (Requirement of "legitimate" birth.) That *methods* be open. (No new and unfamiliar ways of doing things allowed.) But allows that *actions* may be both concealed, and effective in altering the situation.

The moment actions cease to be private—when an effective clairvoyance machine, or spy-ray, becomes available widely—the present culture will collapse. You can't run a poker-type game when the players—or some of them—can read the cards clearly. (Marked cards that some players can read produce this situation.)

In a culture having an Open Actions system, either a hereditary-only system, completely negating the effect of any action, becomes necessary—or a culture in which thinking up new techniques for using known data will develop. Such a culture will accept creative thinking as the norm-to-be-expected. Meanings, not information, will become the critical factors. Anyone using a routine, commonly known method, when his every action is clearly known, will be able to achieve no effective change of the situation. If he accomplishes what he wants to, it will be only because no one has the slightest desire to prevent that accomplishment.

Once introduce an "opening" into a closed game—and that game has to change. What the introduction of TV cameras into the political game has done will, I believe, happen to every other level of human living.

The introduction of such a device will, obviously, cause an immense increase in the insanity rate. It's self-evident that *everyone* will want to own one of the devices—and frantically loathe the idea that *anyone*

else does. People raised in a concealed-game culture are going to have some horrendous psychic problems; prudery may, in an absolute sense, be silly—but it's a violent psychic problem to an individual. Small children, who don't have any privacy anyway, won't be bothered in the slightest, of course, and will simply grow up not being bothered. Individuals who are, and have been, simply instinctively ethical won't be bothered particularly, either—but the shady operator will suffer the tortures of the damned. He can't reconcile himself to playing an open game—and can't help it whether he wants to or not. He'll be like the man who tries to move a knight over a square when his chess-opponent isn't looking—but doesn't realize that his opponent is an expert at blindfold chess and so knows exactly where every piece actually belongs.

"Spy-ray blocks" might well be possible—and still be essentially futile, so far as the psychological effect went, since they would, inevitably, be suspect. After all, in a world which conducts actions openly, the individual who cannot stand to have his actions watched . . . must have *something* wrong with him!

It's apparent that introduction of such a device or technique would destroy the privacy we now hold so dear. (And I repeat that I do not argue either for or against this, but simply that change occurs, and can't be prevented.) The gain may or may not offset that; the gain would be in the right to hold new and independent ideas and attitudes. The fact that, as of now, you are not permitted privacy of mental attitude is naturally not very clearly formulated. One of the attitudes that Society forces on its members is the attitude that no decent, sane person should want to feel differently than other decent, sane people. If you felt differently about—oh, say, slavery, for example, would you be a decent, sane person? If it is impossible to feel that slavery is a rational institution, then clearly Aristotle was either indecent or insane, and so was George Washington, Thomas Jefferson, and a number of other much-admired individuals.

The Society currently holds that hate is a vicious thing, and that no individual should hate anyone. You are required to suppress any hatred-attitudes you may have if you want to be considered sane and decent.

However, if war breaks out, you will be required to hate wholeheartedly until the war is over; otherwise you will be displaying traitorous tendencies. When the war is over again, you will immediately turn off your hatred, or be considered indecent. The fact that, in the interim, your wife or daughter or sister has been captured by the other side, raped, used as a subject for medical experiments, and died in agony must not, of course, cause you to hesitate in turning off your hate.

If you think you really have privacy of effectively expressible emotion—think again, huh?

THE EDITOR.

—continued from Back Cover

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