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WORLDS OF SCIENCE FICTION

MAY 1955 35 CENTS

SNOWBALL

By Poul Anderson

PREVIEW—This reproduction (black plate on blue tint) is from the full-color cover painting by Kelly Freas for the June IF. An interpretation of THE STRANGERS, by Algis Budrys, it is a dramatic presentation of an unusual theme of a story about the "watchers", people of another universe—who might be you or any one around you! Mr. Freas, whose artwork has appeared in leading national publications, considers it one of the best covers he has ever done. Don't miss it. See it in full color on the June IF.

if

WORLDS of SCIENCE FICTION

MAY 1955

All Stories New and Complete

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COVER:

"Technocracy Versus the Humanities" by Kenneth Fagg

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A CHAT WITH THE EDITOR

THE FACT THAT technocracy is leaving the humanities far behind becomes more and more obvious every day. Science is taking the effort of living off our backs, easing everything from our minds to our aching feet. Electrical devices to improve our memory units are now in the experimental stage. Conveyor belts may someday take the place of elevators and sidewalks and hasten us still more on our already hurrying way. Radio clocks wake us up to music and start our breakfast. We can push a button and our automobile starts, we get power to run a drill or a still; a button cleans our house, furnishes conditioned air and warms our feet or what-have-you. Technocracy has taken us into the domain of the birds, the fish and the gophers; it has devised new drugs and techniques for lessening the pain of operations and dentist drills. We are entertained visually and audibly by things that happen thousands of miles away and food comes prepared any way we want it. Everything is geared to a scientific formula for easing the burden of having to do anything laborious or tedious for our mortal selves. But, alas, very little is done to improve the amenities and brotherhood of Mankind.

Exactly what the formula for improving the brotherly relations of Man will be is anybody's guess. I don't think politics will do it; I don't think religion will do it—both have had thousands of years to work on it and haven't improved it noticeably. Philosophy might help, but that is too much of an individual science to work for the masses. Whether one wants to face it or not, it looks as though it will take some common catastrophe to make Mankind pull together, to make two-legged beings appreciate and understand each other as related souls—"misery loves company"; that sort of thing. Whatever the mechanics of achieving that purpose, good or bad or tragic, maybe the end will justify the means. And whether it takes one or two or a thousand or more years, we can sort of anticipate it by developing an optimistic outlook on life while we're around.

MEANWHILE, just to keep busy in my idle moments, I have been working on a little invention that might help out here and there. It's a little gadget that will attack many of our more vicious traits by remedying the situation before too

much harm can be done. It is indeed a remarkable machine, even to the most science-fiction minded, and you will probably recognize radar, telepathy, computing devices and other scientific items in its make-up. It isn't patented yet, so I can't give you the exact blueprint of its manufacture. However, it is easier to tell you *what* it does than *how* it does it.

Take gossip, for instance. Here is a little pastime, innocent enough sometimes, but often as malicious and murderous as a planned campaign of propaganda and lethal weapons.

The scene is the regular Wednesday meeting of the Thursday afternoon bridge club. The girls have gotten together to chat, have tea or a light luncheon and, incidentally, play a little bridge. The gal who's dummy on the first hand starts the ball rolling:

"You know, I heard from Daisy Carter that Gert Smith heard from her third cousin Matilda, who lives in Old Toadstool, that Josie Brown went out with Herman Jukes and didn't get home until four A.M.—and just listen to this!—they were staggering, practically holding each other up. I'll bet they were up to no good. He's the one that . . ."

The bridge game has stopped cold. The gals are lapping up the dirt like four starving cats working on a lone saucer of milk.

Now, this is where my invention cuts in and begins to function.

1. It damps the lady's speech centers and by means of telepathy tries to reason with her that, actually, she has not seen or heard first hand one single thing she is repeating and doesn't know that one single thing she's saying is gospel truth. It tries to impress on her that out of mole hills of unsubstantiated fact she is making mountains to rival the Rockies or the Andes with maybe Mount Everest thrown in. If this little gambit doesn't succeed in penetrating her thick little skull, it . . .

2. Interferes with her digestion of those creamy confections she gobbled at the luncheon, causes violent cramps in her tummy and forces her to retire to the powder room, where she has to stay until everyone else is gone.

3. If measures one and two fail and there is a nice handy chandelier or bucket of paint or anvil or other heavy object nearby, it simply levitates the object to a spot directly over her head and . . .

Something else my invention will be allergic to is the guy who hogs the road when he is driving his old jallopy or his new dynamic hyper-eight; the guy who zooms around corners, ignoring stop lights or full stop signs or runs you over to the side of the road with his maniacal maneuvering. Oh boy! What my invention will do to that monster!

There are many other delightful training-reactions incorporated in this little invention for many, many other circumstances; but there isn't room to tell you about them in this issue. However, you get the general idea.

Let me know if you're in the market for one of the early models.

—jlq

SNOWBALL

Simon's new source of power promised a new era for Mankind. But what happens to world economy when anyone can manufacture it in the kitchen oven? . . . Here's one answer!

Illustrated by Kelly Freas

IT DID not come out of some government laboratory employing a thousand bright young technicians whose lives had been checked back to the crib; it was the work of one man and one woman. This is not the reversal of history you might think, for the truth is that all the really basic advances have been made by one or a few men, from the first to steal fire out of a volcano to $E=mc^2$. Later, the bright young technicians get hold of it, and we have transoceanic airplanes and nuclear bombs; but the idea is always born in loneliness.

Simon Arch was thirty-two years old. He came from upstate Massachusetts, the son of a small-town doctor, and his childhood and adolescence were normal enough aside from tinkering with mathematics and explosive

BY POUL ANDERSON

mixtures. In spite of shyness and an overly large vocabulary, he was popular, especially since he was a good basketball player. After high school, he spent a couple of tedious years in the tail-end of World War II clerking for the Army, somehow never getting overseas; weak eyes may have had something to do with that. In his spare time he read a great deal, and after the war he entered M.I.T. with a major in physics. Everybody and his dog was studying physics then, but Arch was better than average, and went on through a series of graduate assistantships to a Ph.D. He married one of his students and patented an electronic valve. Its value was limited to certain special applications, but the royalties provided a small independent income and he realized his ambition: to work for himself.

He and Elizabeth built a house in Westfield, which lies some fifty miles north of Boston and has a small college—otherwise it is only a shopping center for the local farmers. The house had a walled garden and a separate laboratory building. Equipment for the lab was expensive enough to make the Arches postpone children; indeed, after its requirements were met, they had little enough to live on, but they made sarcastic remarks about the installment-buying rat race and kept out of it. Besides, they had hopes for their latest project: there might be real money in that.

Colin Culquhoun, professor of physics at Westfield, was Arch's closest friend—a huge, red-haired, boisterous man with radical opinions on politics which were always good for an argument. Arch, tall and slim and dark, with horn-rimmed glasses over black eyes and a boyishly smooth face, labelled himself a reactionary.

"Dielectrics, eh?" rumbled Culquhoun one sunny May afternoon. "So that's your latest kick, laddie. What about it?"

"I have some ideas on the theory of dielectric polarization," said Arch. "It's still not too well understood, you know."

"Yeh?" Culquhoun turned as Elizabeth brought in a tray of dewed glasses. "Thank'ee kindly." One hairy hand engulfed a goblet and he drank noisily. "Ahhhh! Your taste in beer is as good as your taste in politics is moldy. Go on."

Arch looked at the floor. "Maybe I shouldn't," he said, feeling his old nervousness rise within him. "You see, I'm operating purely on a hunch. I've got the math pretty well whipped into shape, but it all rests on an unproven postulate about the nature of the electric field. I've tried to fit it in with both relativity and quantum mechanics and—well, like I said, it's all just a notion of mine which demands experimental proof before I can even think about publishing."

"What sort of proof?"

"It's this way. By far the best dielectric found to date is a mixture of barium and strontium titanates. Under optimum conditions, the dielectric constant goes up to 11,600, though the loss rate is still pretty high. There's a partial explanation for this on the basis of

crystal theory, the dipole moment increases under an electric field . . . Well, you know all that. My notion involves an assumption about the nature of the crystalline ionic bond; I threw in a correction for relativistic and quantum effects which *looks* kosher but really hasn't much evidence to back it up. So—uh—"

Elizabeth sat down and crossed trim legs. She was a tall and rather spectacular blonde, her features so regular as to look almost cold till you got to know her. "Our idea suggests it should be possible to fit a crystalline system into an organic grid in such a way that a material can be made with just about any desired values of dielectricity and resistivity," she said. "Constants up in the millions if you want. Physically and chemically stable. The problem is to find the conditions which will produce such an unorthodox linkage. We've been cooking batches of stuff for weeks now."

Culquhoun lifted shaggy brows. "Any luck?"

"Not so far," she laughed. "All we've gotten is smelly, sticky messes. The structure we're after just doesn't want to form. We're trying different catalysts now, but it's mostly cut and try; neither of us is enough of a chemist to predict what'll work."

"Come along and see," offered Arch.

They went through the garden and into the long one-room building beyond. Culquhoun looked at the instruments with a certain wistfulness; he had trouble getting money to keep up any kind of lab. But the heart of the place was merely a second-hand gas stove, converted by haywiring into an airtight, closely regulated oven. It was hot in the room. Elizabeth pointed to a stack of molds covered with a pitchy tar. "Our failures," she said. "Maybe we could patent the formula for glue. It certainly sticks tightly enough."

Arch checked the gauges. "Got a while to go yet," he said. "The catalyst this time is powdered ferric oxide—plain rust to you. The materials include aluminum oxide, synthetic rubber, and some barium and titanium compounds. I must admit that part of it is cheap."

They wandered back toward the house. "What'll you do with the material if it does come out?" asked Culquhoun.

"Oh—it'd make damn good condensers," said Arch. "Insulation, too. There ought to be a lot of money in it. Really, though, the theory interests me more. Care to see it?"

Culquhoun nodded, and Arch pawed through the papers on his desk. The top was littered with his stamp collection, but an unerring instinct seemed to guide his hand to the desired papers. He handed over an untidy manuscript consisting chiefly of mathematical symbols. "But don't bother with it now," he said. "I blew us to a new Bach the other day—St. Matthew Passion."

Culquhoun's eyes lit up, and for a while the house was filled with a serene strength which this century had forgotten. "Mon, mon," whispered the professor at last. "What he could have done with the bag-

pipes!"

"Barbarian," said Elizabeth.

AS IT happened, that one test batch was successful. Arch took a slab of darkly shining material from the lab oven and sawed it up for tests. It met them all. Heat and cold had little effect, even on the electric properties. Ordinary chemicals did not react. The dielectric constant was over a million, and the charge was held without appreciable leakage.

"Why doesn't it arc over?" wondered Elizabeth.

"Electric field's entirely inside the slab," said Arch absently. "You need a solid conductor, like a wire, between the poles to discharge it. The breakdown voltage is so high that you might as well forget about it." He lifted a piece about ten inches square and two inches thick. "You could charge this hunk up with enough juice to run our house for a couple of years, I imagine; of course, it'd be D.C., so you'd have to drain it through a small A.C. generator. The material itself costs, oh, I'd guess fifty cents, a dollar maybe if you include labor." He hesitated. "You know, it occurs to me we've just killed the wet-cell battery."

"Good riddance," said Elizabeth. "The first thing you do, my boy, is make a replacement for that so-called battery in our car. I'm tired of having the clunk die in the middle of traffic."

"Okay," said Arch mildly. "Then we see about patents. But—honey, don't you think this deserves a small celebration of sorts?"

Arch spent a few days drawing up specifications and methods of manufacture. By giving the subject a little thought, he discovered that production could be fantastically cheap and easy. If you knew just what was needed, you had only to mix together a few chemicals obtainable in any drugstore, bake them in your oven for several hours, and saw the resulting chunk into pieces of suitable size. By adding resistances and inductances, which could be made if necessary from junkyard wire, you could bleed off the charge at any desired rate.

Culquhoun's oldest son Robert dropped over to find Arch tinkering with his rickety '48 Chevrolet. "Dad says you've got a new kind of battery," he remarked.

"Uh . . . Yes. I'll make him one if he wants. All we'll need to charge it is a rectifier and a voltmeter. Need a regulator for the discharge, of course." Arch lifted out his old battery and laid it on the grass.

"I've got a better idea, sir," said the boy. "I'd like to buy a *big* piece of the stuff from you."

"Whatever for?" asked Arch.

"Run my hot rod off it," said Bob from the lofty eminence of sixteen years. "Shouldn't be too hard, should it? Rip out the engine; use the big condenser to turn a D.C. motor—it'd be a lot cheaper than gas, and no plugged fuel lines either."

"You know," said Arch, "I never thought of that."

He lifted the ridiculously small

object which was his new current source and placed it inside the hood. He had had to add two pieces of strap iron to hold it in position. "Why a regular motor?" he mused. "If you have D.C. coming out at a controlled rate, you could use it to turn your main drive shaft by a very simple and cheap arrangement."

"Oh, sure," said Robert scornfully. "That's what I meant. Any backyard mechanic could fix that up—if he didn't electrocute himself first. But how about it, Dr. Arch? How much would you want for a piece like that?"

"I haven't the time," said the physicist. "Tell you what, though, I'll give you a copy of the specs and you can make your own. There's nothing to it, if your mother will let you have the oven for a day. Cost you maybe five dollars for materials."

"Sell it for twenty-five," said Bob dreamily. "Look, Dr. Arch, would you like to go into business with me? I'll pay you whatever royalty seems right."

"I'm going to Boston with just that in mind," said Arch, fumbling with the cables. "However, go ahead. Consider yourself a licensee. I want ten percent of the selling price, and I'll trust a Scotch Yankee like you to make me a million."

He had no business sense. It would have saved him much grief if he had.

THE countryside looked clean, full of hope and springtime. Now and then a chrome-plated monster of an automobile whipped past Arch's sedately chugging antique. He observed them with a certain contempt, an engineer's eye for the Goldbergian inefficiency of a mechanism which turned this rod to push that cam to rotate such and such a gear, and needed a cooling system to throw away most of the energy generated. Bob Culquhoun, he reflected, had a saner outlook. Not only was electricity cheaper in the first place, but the wasted power would be minimal and the "prime mover"—the capacitor itself—simply would not wear out.

Automobiles could be sold for perhaps five hundred dollars and built to last, not to run up repair bills till the owner was driven to buying a new model. The world's waning resources of petroleum could go into something useful: generating power at central stations, forming a base for organic syntheses; they would stretch out for centuries more. Coal could really come back into its own.

Hm . . . wait. There was no reason why you couldn't power every type of vehicle with capacitors. Aircraft could stay aloft a month at a time if desired—a year if nothing wore out; ships could be five years at sea. You wouldn't need those thousands of miles of power line littering the countryside and wasting the energy they carried; you could charge small capacitors for home use right at the station and deliver them to the consumer's doorstep at a fraction of the present cost.

Come to think of it, there was a lot of remote power, in waterfalls for instance, unused now because

the distance over which lines would have to be strung was too great. Not any longer! And the sunlight pouring from this cloudless sky—to dilute to run a machine of any size. But you could focus a lot of it on a generator whose output voltage was jacked up, and charge capacitors with thousands of kilowatt-hours each. Generators everywhere could be made a lot smaller, because they wouldn't have to handle peak loads but only meet average demand.

This thing is bigger than I realized, he thought with a tingle of excitement. *My God, in a year I may be a millionaire!*

He got into Boston, only losing his way twice, which is a good record for anyone, and found the office of Addison, his patent attorney. It didn't take him long to be admitted.

The dusty little man riffled through the pages. "It looks all right," he said unemotionally. Nothing ever seemed to excite him. "For a change, this seems to be something which can be patented, even under our ridiculous laws. Not the law of nature you've discovered, of course, but the process—" He peered up, sharply. "Is there any alternative process?"

"Not that I know of," said Arch. "On the basis of theory, I'm inclined to doubt it."

"Very well, very well. I'll see about putting it through. Hm—you say it's quite simple and cheap? Better keep your mouth shut for a while, till the application has been approved. Otherwise everybody will start making it, and you'll have a devil of a time collecting your royalties. A patent is only a license to sue, you know, and you can't sue fifty million bathtub chemists."

"Oh," said Arch, taken aback. "I—well, I've told some of my neighbors, of course. One of the local teen-agers is going to make a car powered by—"

Addison groaned. "You would! Can't you shoot the boy?"

"I don't want to. For a person his age, he's quite inoffensive."

"Oh, well, you didn't want a hundred million dollars anyway, did you? I'll try to rush this for you, that may help."

Arch went out again, some of the elation taken from him. But what the hell, he reflected. If he could collect on only one percent of all the capacitite which was going to be manufactured, he'd still have an unreasonable amount of money. And he wanted to publish as soon as possible in all events: he had the normal human desire for prestige.

He got a hamburger and coffee at a diner and went home. Nothing happened for a month except an interview in the local paper. Bob finished his hot rod and drove it all over town. The boy was a little disappointed at the quietness of the machine, but the interest it attracted was compensation. He began to build another: twenty-five dollars for an old chassis, another twenty-five or so for materials, tack on a hundred for labor and profits—the clunk might not look like much, but it would run for a year without fuel worries and would never need much repair or replace-

ment. He also discovered, more or less clandestinely, that such a car would go up to 200 miles an hour on the straightaway. After selling it, he realized he could command a much bigger price, and set happily to work on another.

The physics journal to which Arch sent his manuscript was interested enough to rush printing. Between the time he submitted it and the time it came out some five weeks later, he found himself in lively correspondence with the editor.

"College will soon be letting out all over the country," said Elizabeth. "Stand by to repel boarders!"

"Mmmm . . . yes, I suppose so." Arch added up the cost of entertaining a rush of colleagues, but his worry was only a flicker across a somewhat bashful glow of pride. After all—he had done a big thing. His polarization theory cut a deep swath into what mystery remained about the atom. There might even be a Nobel Prize in it.

It was on the day of publication that his phone rang. He looked up from his stamps, swore, and lifted it. "Hello?"

"Dr. Arch?" The voice was smooth and cultivated, just a trace of upper-class New York accent. "How do you do, sir. My name is Gilmer, Linton Gilmer, and I represent several important corporations in the electricity field." He named them, and Arch barely suppressed a whistle. "Dr. Bowyer of the *Journal* staff mentioned your work to one of his friends in an industrial research lab. He was quite excited, and you can understand that we are too. I believe I have some good news for you, if I may come to see you."

"Eh—oh. Oh, sure!" Visions whirled across Arch's eyes. Money! It represented a hi-fi set, a threepenny black, an automatic dishwasher, a reliable car, a new oscilloscope, a son and heir. "Come on up, b-by all means—Yes, right away if you like—Okay, I—I'll be seeing you—" He set the receiver down with a shaking hand and bawled: "Betty! Company coming!"

"Oh, damn!" said his wife, sticking a grease-smudged face in the door. She had been tinkering with the lab oven. "And the house in such a mess! So am I, for that matter. Hold the fort when he comes, darling." She still didn't know who "he" was, but whirled off in a cloud of profanity.

Arch thought about putting on a decent suit and decided to hell with it. Let them come to him and accept him as he was; he had the whip hand, for once in his life. He contented himself with setting out beer and clearing the littered coffee table.

Linton Gilmer was a big man, with a smooth well-massaged face, wavy gray hair, and large soft hands. His presence seemed to fill the room, hardly leaving space for anyone else.

"Very pleased to meet you, Dr. Arch . . . brilliant achievement . . . We borrowed proof sheets from the *Journal* and made tests for ourselves, of course. I'm sure you don't mind. Thank you." He seemed just

a trifle shocked at being offered beer rather than Johnny Walker Black at four o'clock in the afternoon, but accepted gracefully. Arch felt excessively gauche.

"What did you want to s-see me about?" asked the physicist.

"Oh, well, sir, let's get acquainted first," said Gilmer heartily. "No rush. No hurry. I envy you scientific fellows. The unending quest, thrill of discovery, yes, science was my first love, but I'm afraid I sort of got steered off into the business administration end. I know you scientists don't think much of us poor fellows behind the desks, you should hear how our boys gripe when we set the appropriations for their projects, but somebody has to do that, ha." Gilmer made a bridge of plump fingers. "I do think, though, Dr. Arch, that this hostility is coming to an end. We're both part of the team, you know; scientist and businessman both work inside our free enterprise system to serve the American public. And more and more scientists are coming to recognize this."

Arch shifted uneasily in his chair. He couldn't think of any response. But it was simple to converse with Gilmer: you just sat back, let him flow, and mumbled in the pauses.

Some data began to emerge: "—we didn't want to trouble you with a dozen visitors, so it was agreed that I would represent the combine to, ah, sound you out, if I may so phrase it."

Arch felt the stir of resentment which patronizing affability always evoked in him. He tried to be courteous: "Excuse me, but isn't that sort of thing against the anti-trust laws?"

"Oh, no!" Gilmer laughed. "Quite the opposite, I assure you. If one company tried to corner this product, or if all of them went together to drive the price up, that would be illegal, of course. But we all believe in healthy competition, and only want information at the moment. Negotiations can come later."

"Okay," said Arch. "I suppose you know I've already applied for a patent."

"Oh, yes, of course. Very shrewd of you. I like to deal with a good businessman. I think you're more broadminded than some of your colleagues, and can better understand the idea of teamwork between business and science." Gilmer looked out the French doors to the building in the rear. "Is that your laboratory? I admire a man who can struggle against odds. You have faith, and deserve to be rewarded for it. How would you like to work with some real money behind you?"

Arch paused. "You mean, take a job on somebody's staff?"

"Not as a lab flunky," said Gilmer quickly. "You'd have a free hand. American business recognizes ability. You'd plan your own projects, and head them yourself. My own company is prepared to offer you twenty thousand a year to start."

Arch sat without moving.

"After taxes," said Gilmer.

"How about this—capacitite, I call it?"

"Naturally, development and marketing would be in the hands of the company, or of several companies," said Gilmer. "You wouldn't want to waste your time on account books. You'd get proper payment for the assignment, of course—"

Elizabeth entered, looking stunning. Gilmer rose with elaborate courtesy, and the discussion veered to trivialities for awhile.

Then the girl lit a cigaret and watched them through a haze of smoke. "Your time is valuable, Mr. Gilmer," she said abruptly. "Why don't you make an offer and we'll talk about that?"

"Oh, no hurry, Mrs. Arch. I was hoping you would be my guests tonight—"

"No, thanks. With all due regard for you, I don't want to be put under a moral obligation before business is discussed."

Gilmer chuckled amiably and repeated the idea he had broached.

"I like Westfield," said Elizabeth. "I don't like New York. It isn't fit for human consumption."

"Oh, I quite agree," said Gilmer. "Once a year I have to break loose —cabin up in Maine, hunting, fishing, back to Nature—you really must come up sometime soon. Your objection can be answered easily enough. We could set up a laboratory for you here, if you really insist. You see, we're prepared to be very generous."

Arch shook his head. "No," he said harshly. "No, thanks. I like being independent."

Gilmer raised his brows. "I understand that. But after all, the only difference would be—"

Arch grinned. He was enjoying himself now. On a dark day some years ago, he had tried to raise a bank loan and had failed for lack of collateral and credit rating and his refusal to subject any friend to co-signing. Ever since, he had indulged daydreams about having finance come crawling to him. The reality was intoxicating.

"No," he repeated. "That's all I want to say about it, too. The income from capacitite will be quite enough for us. If you want to discuss a license to manufacture, go ahead."

"Hrm! As you wish." Gilmer smoothed the coldness out of his voice. "Maybe you'll change your mind later. If so, feel free to call on me anytime. Now, for an assignment of rights, I think a sum of fifty thousand dollars could be arranged—"

Elizabeth drooped lids over startlingly blue eyes. "As an initial payment, perhaps," she said gently. "But think what a royalty of, say, ten cents a pound would add up to even in a year."

"Oh, yes, that would be negotiated too," said Gilmer. "However, you realize manufacture could not start immediately, and would in any case be on a smaller scale than you perhaps think."

"Eh?" Arch sat bolt upright. "What do you mean? Why, this stuff is going to revolutionize not only electronics, but all power—dammit, everything!"

"Dr. Arch," said Gilmer regretfully, "you must not have considered the matter of capital invest-

ment. Do you know how many billions of dollars are sunk in generators, dams, lines, motors—"

"Gasoline," said Elizabeth. "We've thought of that angle too."

"We *can't* throw all that in the discard!" went on Gilmer earnestly. He seemed more human, all at once. "It may take twenty years to recover the investment in, say, a local transmission network. The company would go broke overnight if that investment were suddenly made valueless. Millions of people would be thrown out of work. Millions more would lose their savings in stocks and bonds—"

"I always said stocks were a mug's game," interrupted Arch. "If the two or three shares owned by the widow and orphan you're leading up to go blooey, it won't break her. For years, now, I've had ads dinning the wonders of the present economic system into my ears. One of its main features, I'm told, is progress. All right, here's a chance to leap a hundred years ahead. Let's see you take it."

Gilmer's pink cheeks reddened. "I'm afraid you still don't understand," he replied. "We have a responsibility. The world is watching us. Just imagine what those British Socialists would say if—"

"If you're against socialism," said Elizabeth with a laugh, "why not start at home? Public schools and federal highways, for instance. I fail to see where personal liberty is necessarily tied to any particular method of distribution."

Gilmer seemed, for a moment, to lose his temper. "This is no place for radicals," he said thickly. "We've all got to have faith and put our shoulders to the wheel. We—" He paused, swallowed, and smiled rather stiffly. "Excuse me. I didn't mean to get worked up. There are a lot of stories about wonderful new inventions which the greedy corporations have bought up and hidden away. They simply are not true. All I'm after is a gradual introduction of this material."

"I know those wonderful inventions are pure rumor," said Arch. "But I also know that just about everything I buy is made to wear out so I'll have to buy some more. It's cheaper, yes, but I'd rather pay twice as much to start with and have my purchase last ten times as long. Why can't I buy a decent kitchen knife? There's not one that keeps its edge. My wife finally made eyes at the butcher and got one of his old knives; *it* lasts.

"A big thing like capacitite represents a chance to change our whole philosophy into something more rational. That's what I'm after—not just money. There needn't be any unemployment. Capacitite makes increased production possible, so why not—well, why not drop the work day to four hours for the same wages? Then you can employ twice as many people."

"It is not your or my place to make carping criticisms," retorted Gilmer. "Fundamental changes aren't as easy as you think. Dr. Arch, I'm sorry to say that unless you'll agree to proper terms, none of the companies I represent will be interested in your material."

"All right," snapped Arch. "I can make it myself. Make it by the ton if I like, and sell it for a dollar a pound."

"You may find yourself undersold."

"My patent—"

"It hasn't gone through yet. That takes time, plenty of time if you don't want to cooperate. And even if it is granted, which I by no means guarantee, you'll have to sue infringers; and do you know how crowded court calendars are? And how expensive a series of appeals can make such a suit?"

"Okay," said Elizabeth sweetly. "Go ahead and make it. You just got through telling us why you can't."

Gilmer looked out the window. "This is a great country," he said, with more sincerity than Arch had expected. "No country on earth has ever been so rich and happy. Do you know how it got that way?"

"By progressing," said Arch. "For your information, I am not a leftist; I'll bet I'm far to the right of you. So far, that I still believe in full speed ahead and damn the torpedoes."

Gilmer rose, with a certain dignity. "I'm afraid tempers are getting a little short," he said quietly. "I beg of you to reconsider. We'll fight for the public interest if we must, but we'd rather cooperate. May I leave my card? You can always get in touch with me."

He made his farewells and left. Arch and Elizabeth looked somewhat blankly at each other.

"Well, Killer," said the girl at last, "I hope we haven't taken too big a chaw to swallow."

CULQUHOUN dropped over in the evening and listened to their account. He shook his head dubiously. "You're up against it, laddie," he said. "They'll defend their coffers to the bitter end."

"It isn't that." Arch stared moodily into the darkness. "I don't think they're a bunch of monsters—no more than anybody else. They just believe in the status quo. So do you, you know."

"How?" Culquhoun bristled. "I'll admit I'm not the hell-fire revolutionary of my undergraduate days, but I still think a basic change is called for."

"Not basic," said Arch. "You just want to change part of the mechanism. But you'd keep the same ant-heap industrial society. I believe the heart went out of this land after the Civil War, and the death warrant was signed about 1910. Before then, a man was still an individual; he worked for himself, at something he understood, and wasn't afraid to stand up and spit in the eye of the world. Now he spends his daily routine on an assembly line or behind a desk or counter, doing the same thing over and over for someone else. In the evening he watches the same pap on his television, and if something goes wrong he whines his way to the apartment superintendent or the VA or the Social Security office.

"Look at the progress of euphemism. Old people are Senior Citizens. Draft becomes Selective Service.

Graveyard to cemetery to memorial park. We've become a race of dependents. And we can't break away: there isn't any frontier left, there isn't any alternative society, one man can't compete with a corporation. Or with a commissar, for that matter.

"What we need is not to go back to living in log cabins, but to make the means of sustenance and the sources of energy so cheap that every man can have them in sufficient quantity to live and work. I don't know—maybe I'm being vainglorious, but it does seem as if capacitite is a long step in that direction."

"I warn you, you're talking good Marxism," said Culquhoun with a grin. "The means of production determine the type of society."

"Which is pure hogwash," answered Arch. "Egypt and Assyria had identical technologies. So did Athens and Sparta. So do America and Russia. The means of production only determine the *possible* societies, and there are always many possibilities.

"I'd like to see the possibility of individualism available again to the American people. If they're too far gone to accept it, to hell with them."

The government can work fast when it wants to. It was just the following afternoon when the phone rang again. Elizabeth came out to the lab, where Arch and Bob Culquhoun were preparing a batch of capacitite, with a strained look on her face. "Come inside, dear," she said thinly. "I've got some bad news." When he was in the house, she added: "Two FBI men are on their way here."

"What the devil?" Arch felt a gulp of fear. It was irrational he told himself. The FBI was no Gestapo; on the whole, he approved of it. Maybe some friend had given his name as a security reference. "All right. We'll see what they want."

"I'm going to start some coffee," said Elizabeth. "Lucky we've got a cake too."

"Huh?"

"You'll see." She patted his cheek and managed a smile. "You're too innocent, sweetheart."

Sagdahl and Horrisford turned out to be hard young men with carefully expressionless faces. They introduced themselves very politely, and Arch led the way into the living room. Horrisford took out a notebook.

"Well," said Arch a little huskily, "what can I do for you?"

"You can answer some questions, if you please," said Sagdahl tonelessly. "You don't have to answer any, and whatever you say can be used in evidence."

"I haven't broken any laws that I know of," said Arch feebly.

"That remains to be seen. This is an investigation."

"Whatever *for?*"

"Dr. Arch," said Sagdahl patiently, "yesterday you published an article on a discovery of potential military importance. It has upset a great many plans. Worse, it has been released with no discretion whatsoever, and the consequences aren't easy to foresee. If

we'd had any inkling, it would never have been published openly. As it is, you went outside regular channels and—"

"I didn't have to go through channels," said Arch. "I've never gotten any confidential data, or even applied for a clearance. I work for myself and—" He saw Horrisford busily writing, and his words dried up.

The realization was appalling. The military applications of capacitite had crossed his mind only vaguely and been dismissed with an escapist shrug.

"Let's get down to business," said Sagdahl. "Everything will be a lot easier if you cooperate. Now, where were you born?"

Arch hadn't imagined anyone could be so thorough about tracking down a man's entire life. He answered frankly, feeling he had nothing to hide. Of course, there *had* been his roommate at M.I.T., and the roommate had had a girl friend one of whose other friends was a Communist, and . . .

"I see. Now, when you graduated—"

Elizabeth entered from the kitchen with a tray. "Pardon me," she smiled. "I think refreshments are in order."

Sagdahl's face didn't change, but his eyes bugged slightly. Elizabeth put a coffee cup in his hand and a plate of cake on one knee. He looked unhappy, but mumbled dutiful thanks.

"Oh, it's a pleasure," said Elizabeth blandly. "You boys are doing your duty, and really, this is very exciting."

Sagdahl got down a mouthful of cake. Valiantly, he tried to resume the staccato flow: "Now, when you graduated, Dr. Arch, you took a vacation, you say. Where was that?"

"Up in Quebec. About three months. Just driving around and —"

"I see. Then you returned to school for a master's degree, right? Did you at this time know a Joseph Barrett?"

"Well, yes, I shared an office with him."

"Did you ever discuss politics with him?"

"Drink your coffee before it gets cold," said Elizabeth. "There's plenty more."

"Oh—thanks. Now, about this Barrett?"

"We argued a lot. You see, I'm frankly a reactionary—"

"Were you associated with any political-action group?"

"Mr. Horrisford," said Elizabeth reproachfully, "you haven't touched your cake."

"No, I wasn't that interested," said Arch. "Didn't even bother to vote in '50."

"Here, Mr. Sagdahl, do have some more cake."

"Thanks!— You met some of Barrett's friends?"

"Yes, I was at some parties and—"

"Excuse me, I'll just warm your coffee."

"Did you at this time know anyone who had worked in the Manhattan Project?"

"Of course. They were all over the place. But I never was told

anything restricted, never asked for—"

"Please, Mr. Horrisford! It's my favorite recipe."

"Ummm. Thank you, but—"

"You met your future wife when?"

"In—"

"Excuse me, there's the phone... Hello. Mrs. Arch speaking . . . Oh?. . . Yes, I'll see. . . Pardon me. There's a man from the Associated Press in town. He wants to see you, dear."

Sagdahl flinched. "Stall him off," he groaned. "Please."

"Can't do that forever," said Arch. "Not under the circumstances."

"I realize that, Dr. Arch." Sagdahl clenched his jaw. "But this is unprecedented. As an American citizen, you'll want to—"

"Certainly we'll cooperate," said Elizabeth brightly. "But what shall I tell the AP man? That we're not supposed to say anything to anyone?"

"No! That won't do, not now. But—are all the technical details of this public?"

"Why, yes," said Arch. "Anybody can make capacitite."

"If you issued a denial—"

"Too late, I'm afraid. Somebody's bound to try it anyway."

Sagdahl looked grim. "You can be held incommunicado," he said. "This is a very serious matter."

"Yes," said Elizabeth. "The AP man will think so too, if he can't get a story."

"Well—"

"Oh, dear! My Russell Wright coffee cup!"

NOTHING happened overnight. That was the hardest thing to believe. By all the rules, life should have been suddenly and dramatically transformed; but instead, there were only minor changes, day by day, small incidents. Meanwhile you ate, slept, worked, paid bills, made love and conversation, as you had always done.

The FBI held its hand as yet, but some quiet men checked into the town's one hotel, and there was usually one of them hanging around Arch's house, watching. Elizabeth would occasionally invite him in for a snack—she grew quite fond of them.

The newspapers ran feature articles, and for a while the house was overrun with reporters—then that too faded away. Editorials appeared, pointing out that capacitite had licked one of the Soviet Union's major problems, fuel; and a syndicated columnist practically called for Arch's immediate execution. He found some of his neighbors treating him coldly. The situation distressed him, too. "I never thought—" he began.

"Exactly," rumbled Culquhoun. "People like you are one reason science is coming to be considered a Frankenstein. Dammit, man, the researcher has to have a social conscience like the rest of us."

Arch smiled wearily. "But I do," he said. "I gave considerable thought to the social effects. I just imagined that they'd be good. That's been the case with every major innovation, in the long run."

"You've committed a crime," said Culquhoun. "Idealism. It

doesn't fit the world we inhabit."

Arch flushed angrily. "What was I supposed to do?" he snapped. "Burn my results and forget them? If the human race is too stupid to use the obvious advantages, that's its own fault."

"You're making a common error, dear," said Elizabeth. "You speak of the human race. There isn't any. There are only individual people and groups of people, with their own conflicting interests."

For a while, there was a big campaign to play down the effects of capacitite. It wasn't important. It meant nothing, as our eminent columnist has so lucidly shown. Then the attempt switched: capacitite was dangerous. So-and-so had been electrocuted working with it. There was cumulative poisoning. . . Such propaganda didn't work, not when some millions of people were seeing for themselves.

Petroleum stock began sagging. It didn't nosedive—the SEC and a valiantly buying clique saw to that—but it slipped down day by day.

Arch happened to drop in at Hinkel's garage. The old man looked up from a car on which he was laboring and smiled. "Hello, there," he said. "Haven't seen you in a long time."

"I—well—" Arch looked guiltily at the oil-stained floor. "I'm afraid—your business—"

"Oh, don't worry about me. I've got more business than I can handle. Everybody in town seems to want his car converted over to your type of engine. That young Bob is turning out the stuff like a printing press gone berserk."

Arch couldn't quite meet his eyes. "But—aren't your gasoline sales dropping?"

"To be sure. But cars still need lubrication and— Look, you know the old watermill down by Ronson's farm? I'm buying that, putting in a generator and a high-voltage transformer and rectifier. I'll be selling packaged power. A lot easier than running a gas pump, at my age."

"Won't the power company be competing?"

"Eventually. Right now, they're still waiting for orders from higher up, I guess. Some people can charge their capacitors right at home, but most would rather not buy the special equipment. They'll come to me, and by the time the power outfit gets wise to itself, I'll 've come in on the ground floor."

"Thanks," said Arch, a little shakily. "It makes me feel a lot better."

If only everybody had that Yankee adaptability, he thought as he walked home. But he saw now, as he wished he had seen earlier, that society had gone too far. With rare exceptions, progress was no longer a matter of individual readjustments. It was a huge and clumsy economic system which had to make the transformation . . . a jerry-built system whose workings no one understood, even today.

He wanted to call up Gilmer and make what terms he could, but it was too late. The snowball was rolling.

He sighed his way into an armchair and picked up the paper.

Item: the bill before Congress to make capacitite a government monopoly like uranium, and to enforce all security restrictions on it, had been sent back to committee and would probably not pass. A few senators had had the nerve to point out that security was pointless when everybody could already make the stuff.

Item: the government was setting up a special laboratory to study the military applications. Arch could think of several for himself. Besides simplifying logistics, it could go into cheap and horrible weapons. A bomb loaded with several thousand coulombs, set to discharge instantaneously on striking—

Item: a well-known labor leader had denounced the innovation as a case of business blundering which was going to take bread from the working man. A corporation spokesman declared that it was all a leftist trick designed to cripple the private enterprise system.

Item: *Pravda* announced that Soviet scientists had discovered capacitite ten years ago and that full-scale production had long been under way for peaceful purposes only, such as making the Red Army still more invincible.

Item: two more men in America electrocuted due to incautious experiments. Nevertheless, capacitite was being manufactured in thousands of homes and workshops. Bills in various state legislatures to ban vehicles so powered were meeting indignant opposition everywhere save in Texas.

Arch reflected wryly that he wasn't getting paid for any of this. All he'd gotten out of it so far was trouble. Trouble with the authorities, with crank letters, with his own conscience. There were, to be sure, some royalties from Bob Culquhoun, who was becoming quite an entrepreneur and hiring adults to take over when school opened in fall.

Speaking of tigers by the tail—

AUTUMN, the New England fall of rain and chill whistling wind, smoky days and flame-like leaves and the far wild honking of southbound geese. The crash came in late September: a reeling market hit bottom and stayed there. Gasoline sales were down twenty-five percent already, and the industry was laying men off by the hundreds of thousands. That cut out their purchasing power and hit the rest of the economy.

"It's what you'd expect, laddie," said Culquhoun. They were over at his house. Outside, a slow cold rain washed endlessly down the windows. "Over production—overcapitalization—I could have predicted all this."

"Damn it to hell, it doesn't make *sense!*" protested Arch. "A new energy source should make everything cheaper for everybody—more production available for less work." He felt a nervous tic beginning in one cheek.

"Production for use instead of for profit—"

"Oh, dry up, will you? Any system is a profit system. It has to show a profit in some terms or other, or

it would just be wasted effort. And the profit has to go to individuals, not to some mythical state. The state doesn't eat—people do."

"Would you have the oil interests simply write off their investment?"

"No, of course not. Why couldn't they— Look. Gasoline can still run generators. Oil can still lubricate. Byproducts can still be synthesized. It's a matter of shifting the emphasis of production, that's all. All that's needed is a little common sense."

"Which is a rather scarce commodity."

"There," said Arch gloomily, "we find ourselves in agreement."

"The trouble is," said Bob earnestly, "we're faced with a real situation, not a paper problem. It calls for a real solution. For an idea."

"There aren't any ideas," said Elizabeth. "Not big sweeping ones to solve everything overnight. Man doesn't work that way. What happens is that somebody solves his own immediate, personal problems, somebody else does the same, and eventually society as a whole fumbles its way out of the dilemma."

Arch sighed. "This is getting over my head," he admitted. "Thanks for small blessings: the thing has grown so big that I, personally, am becoming forgotten."

He rose. "I'm kind of tired tonight," he went on. "Maybe we better be running along. Thanks for the drinks and all."

He and his wife slipped into their raincoats and galoshes for the short walk home. The street outside was dark, a rare lamp glowing off slick wet concrete. Rain misted his face and glasses, he had trouble seeing.

"Poor darling," Elizabeth took his arm. "Don't worry. We'll get through all right."

"I hope so," he said fervently. No money had come in for some time now. Bob's enterprise was levelling off as initial demand was filled, and a lurching industry wasn't buying many electronic valves. The bank account was getting low.

He saw the figure ahead as a vague shadow against the night. It stood waiting till they came up, and then stepped in their path. The voice was unfamiliar: "Arch?"

"Yes—"

He could see only that the face was heavy and unshaven, with something wild about the mouth. Then his eyes dropped to the revolver barrel protruding from the slicker. "What the devil—"

"Don't move, you." It was a harsh, broken tone. "Right now I'm aiming at your wife. I'd as soon shoot her, too."

Fear leaped crazily in Arch's breast. He stood unable to stir, coldness crawling in his guts. He tried to speak, and couldn't.

"Not a word, you—. Not another word. You've said too goddam much already." The gun poked forward, savagely. "I'm going to kill you. You did your best to kill me."

Elizabeth's face was white in the gloom. "What do you mean?" she whispered. "We never saw you before."

"No. But you took away my job. I was in the breadlines back in

the thirties. I'm there again, and it's your fault, you— Got any prayers to say?"

A gibbering ran through Arch's brain. He stood motionless, thinking through a lunatic mind-tilt that there must be some way to jump that gun, the heroes of stories always did it, that might—

Someone moved out of the night into the wan radiance. An arm went about the man's throat, another seized his gun wrist and snapped it down. The weapon went off, sounding like the crack of doom in the stillness.

They struggled on the slippery sidewalk, panting, the rain running over dimly glimpsed faces. Arch's paralysis broke, he moved in and circled around, looking for a chance to help. There! Crouching, he got hold of the assassin's ankle and clung.

There was a meaty smack above him, and the body sagged.

Elizabeth held her hand over her mouth, as if to force back a scream. "Mr. Horrisford," she whispered.

"The same," said the FBI man. "That was a close one. You can be thankful you're an object of suspicion, Arch. What was he after?"

Arch stared blankly at his rescuer. Slowly, meaning penetrated. "unemployed—" he mumbled. "Bitter about it—"

"Yeah. I thought so. You may be having more trouble of that sort. This depression, people have someone concrete to blame." Horrisford stuck the gun in his pocket and helped up his half-conscious victim. "Let's get this one down to the lockup. Here, you support him while I put on some handcuffs."

"But I wanted to help his kind," said Arch feebly.

"You didn't," said Horrisford. "I'd better arrange for a police guard."

ARCH spent the following day in a nearly suicidal depression. Elizabeth tried to pull him out of it, failed, and went downtown after a fifth of whiskey. That helped. The hangover helped too. It's hard to concentrate on remorse when ten thousand red-hot devils are building an annex to Hell in your skull. Toward evening, he was almost cheerful again. A certain case-hardening was setting in.

After dark, there was a knock on the door. When he opened it, Horrisford and a stranger stood there.

"Oh—come in," he said "Excuse the mess. I—haven't been feeling so well."

"Anyone here?" asked the agent.

"Just my wife."

"She'll be all right," said the stranger impatiently. He was a big, stiff, gray-haired man. "Bring her in, please. This is important."

They were settled in the living room before Horrisford performed the introductions. "Major General Brackney of Strategic Services." Arch's hand was wet as he acknowledged the handclasp.

"This is most irregular," said the general. "However, we've put through a special check on you. A fast but very thorough check. In spite of your errors of judgment, the FBI is convinced of your essen-

tial loyalty. Your discretion is another matter."

"I can keep my mouth shut, if that's what you mean," said Arch.

"Yes. You kept one secret for ten years," said Horrisford. "The business of Mrs. Ramirez."

Arch started. "How the deuce—? That was a personal affair. I've never told a soul, not even my wife!"

"We have our little ways." Horrisford grinned, humanly enough. "The point is that you could have gained somewhat by blabbing, but didn't. It speaks well for you."

General Brackney cleared his throat. "We want your help on a certain top-secret project," he said. "You still know more about capacitite than anybody else. But if one word of this leaks out prematurely, it means war. Atomic war. It also means that all of us, and you particularly, will be crucified."

"I—"

"You're an independent so-and-so, I realize. What we have in mind is a scheme to prevent such a war. We want you in on it both for your own value and because we can't protect you forever from Soviet agents." Brackney's smile had no humor. "Didn't know that, did you? It's one reason you're being co-opted, in spite of all you've done.

"I can't say more till you take the oath, and once you've done that you're under all the usual restrictions. Care to help out?"

Arch hesitated. He had little faith in government . . . any government. Still—

Horrisford of the FBI had saved his life.

"I'm game," he said.

Elizabeth nodded. The oath was administered.

Brackney leaned back and lit a cigar. "All right," he said. "I'll come to the point.

"Offhand, it looks as if you've done a grave disservice to your country. It's been pointed out in the press that transporting fuel is the major problem of logistics. In fact, for the Russians it's *the* problem, since they can live off the countries they invade to a degree we can't match. You've solved that for them, and once they convert their vehicles we can expect them to start rolling. They and their allies—especially the Chinese. This discovery is going to make them a first-class power."

"I've heard that," said Arch thinly.

"However, we also know that the communist regimes are not popular. Look at the millions of refugees, look at all the prisoners who refused repatriation, look at the Ukranian insurrection—I needn't elaborate. The trouble has been that the people aren't armed. To say anything at home means the concentration camp.

"Now, then. Basically, the idea is this. We've got plants set up to turn out capacitite in trainload lots. We can, I think, make weapons capable of stopping a tank for a couple of dollars apiece. Do you agree?"

"Why—yes," said Arch. "I've been considering it lately. A rifle discharging its current through magnetic coils to drive a steel-

jacketed bullet—the bullet could be loaded with electricity too. Or a Buck Rogers energy gun: a hand weapon with a blower run off the capacitor, sucking in air at the rear and spewing it out between two electrodes like a gigantic arc-welding flame. Or—yes, there are all kinds of possibilities."

Brackney nodded with an air of satisfaction. "Good. I see you do have the kind of imagination we need.

"Now, we'll be giving nothing away, because they already know how to make the stuff and can think up anything we can. But, we have a long jump as far as production facilities are concerned.

"The idea is this. We want to make really enormous quantities of such weapons. By various means—through underground channels, by air if necessary—we want to distribute them to all the Iron Curtain countries. The people will be armed, and hell is going to break loose!

"We want you in on it as design and production consultants. Leave tomorrow, be gone for several months probably. It's going to have to be highly organized, so it can be sprung as a surprise; otherwise the Soviet bosses, who are no fools, will hit. But your part will be in production. Are you game?"

"It's—astonishing," said Elizabeth. "Frankly, I didn't think the government had that much imagination."

"We're probably exceeding our authority," admitted Brackney. "By rights, of course, Congress should be consulted, but this is like the Louisiana Purchase: there's no time to do so."

It was the historical note which decided Arch. Grade-school history, yes—but it didn't fit in with his preconceptions of the red-necked militarist. Suddenly, almost hysterically, he was laughing.

"What's so funny?" asked Horrisford sharply.

"The idea—what old Clausewitz would say—winning wars by arming the enemy! Sure—sure, I'm in. Gladly!"

SIX MONTHS on a secret reservation in Colorado which nobody but the top brass left, six months of the hardest, most concentrated work a man could endure, got Arch out of touch with the world. He saw an occasional newspaper, was vaguely aware of trouble on the outside, but there was too much immediately at hand for him to consider the reality. Everything outside the barbed-wire borders of his universe grew vague.

Designing and testing capacitite weapons was harder than he had expected, and took longer: though experienced engineers assured him the project was moving with unprecedented speed and ease. Production details were out of his department, but the process of tooling up and getting mass output going was not one for overnight solution.

The magnetic rifle; the arc gun; the electric bomb and grenade; the capacitite land mine, set to fry the crew of any tank which passed over—he knew their hideous uses, but there was a cool ecstasy in

working with them which made him forget, most of the time. And after all, the idea was to arm men who would be free.

In March, General Brackney entered the Quonset hut which Arch and Elizabeth had been inhabiting and sat down with a weary smile. "I guess you're all through now," he said.

"About time," grumbled the girl. "We've been sitting on our hands here for a month, just puttering."

"The stuff had to be shipped out," said the general mildly. "We didn't dare risk having the secret revealed. But we're rolling overseas, it's to late to stop anything." He shrugged. "Naturally, the government isn't admitting its part in this. Officially, the weapons were manufactured by independent operators in Europe and Asia, and you'll have to keep quiet about the truth for a long time—not that the comrades won't be pretty sure, but it just can't be openly admitted. However, there are no security restrictions on the gadgets themselves, as of today."

"That surprises me," said Arch.

"It's simple enough. Everything is so obvious, really—any handyman can make the same things for himself. A lot have been doing it, too. No secrets exist to be given away, that's all." Brackney hesitated. "We'll fly you back home anytime you wish. But if you want to stay on a more permanent basis, we'll be glad to have you."

"No, thanks!" Elizabeth's eyes went distastefully around the sleazy interior of the shack.

"This has all been temporary," said the general. "We were in such a hell of a hurry. Better housing will be built now."

"Nevertheless, no," said Arch.

Brackney frowned. "I can't stop you, of course. But I don't think you realize how tough it's getting outside, and how much worse it's going to get. A revolution is starting, in more senses than one, and you'll be safer here."

"I heard something about that," agreed Arch. "Discontented elements making their own weapons, similar to ours—what of it?"

"Plenty," said the officer with a note of grimness. "It's an ugly situation. A lot of people are out of work, and even those who still have jobs don't feel secure in them. There are a dozen crank solutions floating around, everything from new political theories to new religious sects, and each one is finding wider acceptance than I'd have believed possible."

"It doesn't surprise me," said Arch. "There's a queer strain of the True Believer in American culture. You know how many utopian colonies we've had throughout our history? And the single tax party, and prohibition, and communism in the thirties. People in this country want something concrete to believe in, and all but a few of the churches have long ago degenerated into social clubs."

"Whatever the cause," said Brackney, "there are all these new groups, clashing with the old authorities and with each other. And the underworld is gleefully pitching in, and getting a lot of recruits from the ranks of hungry, fright-

ened, embittered people.

"The regular armed forces have to be mobilized to stop anything the Soviets may try. The police and the National Guard have their hands full in the big cities. The result is, that authority is breaking down everywhere else. There's real trouble ahead, I tell you."

"All right," said Arch. "That's as may be. But our town is a collection of pretty solid folk—and we want to go home."

"On your heads be it. There'll be a plane at six tomorrow."

—The fact did not strike home till they were stopping over at Idlewild and saw uniformed men and machine-gun emplacements. In the coffee shop, Arch asked the counterman just how bad things really were.

"Rough," he answered. "See this?" He flipped back his jacket, showing a homemade capacitite pistol in a holster.

"Oh, look now—"

"Mister, I live in Brooklyn. I don't get home till after dark, and the police cordons don't go closer than six blocks to my place. I've had to shoot twice already in the past couple months."

"Bandits?"

"In gangs, mister. If I could work somewhere closer to home, I'd be off like a shot."

Arch set down his cup. Suddenly he didn't want any more coffee. *My God,* he thought, *am I responsible for that?*

A smaller plane carried them to Boston, where they caught a bus for Westfield. The driver had an automatic rifle by his seat. Arch huddled into himself, waiting for he knew not what; but the trip was uneventful.

The town didn't seem to have changed much. Most of the cars were converted, but it didn't show externally. The drug store still flashed neon at a drowsy sidewalk, the Carnegie library waited rather wistfully for someone to come in, the dress shop had the same old dummies in the window. Elizabeth pointed at them. "Look," she said. "See those clothes?"

"They're dresses," said Arch moodily. "What about them?"

"No style change in six months, that's all," said Elizabeth. "It gives me the creeps."

They walked along streets banked with dirty, half-melted snow, under a leaden sky and a small whimpering wind. Their house had not changed when they entered, someone had been in to dust and it looked like the home they remembered. Arch sank tiredly into his old armchair and accepted a drink. He studied the newspaper he'd bought at the depot. Screaming headlines announced revolt in Russia—mass uprisings in the Siberian prison camps — announcements from the Copenhagen office of the Ukrainian nationalist movement—It all seemed very far away. The fact that there were no new dress styles was somehow closer and more eerie.

A thunderous knock at the door informed him that Culquhoun had noticed their lights. "Mon, it's guid to see ye again!" The great paw engulfed his hand. "Where've ye been a' the while?"

"Can't tell you that," said Arch.

"Aweel, you'll permit me to make my own guesses, then." Culquhoun cocked an eye at the paper. "Who do they think they're fooling, anyhow? We can look for the Russian bombers any day now."

Arch considered his reply. That aspect had been thoroughly discussed at the project, but he wasn't sure how much he could tell. "Quite possibly," he said at last. "But with their internal troubles, they won't be able to make many raids, or any big ones—and the little they will be able to throw at us should be stopped while they're still over northern Canada."

"Let's hope so," nodded Culquhoun. "But the people in the large cities won't want to take the chance. There's going to be an exodus of considerable dimensions in the next few days, with all that that implies." He paused, frowning. "I've spent the last couple of months organizing a kind of local militia. Bob has been making capacitite guns, and there are about a hundred of us trying to train ourselves. Want in on it?"

"They'd probably shoot me first," whispered Arch.

The red head shook, bear-like. "No. There's less feeling against you locally than you seem to think. After all, few if any of the people in this area have been hurt—they're farmers, small shopkeepers trading in the essentials, students, college employees. Many of them have actually benefited. You have your enemies here, but you have more friends."

"I think," said Arch thinly, "that I'm becoming one of my own enemies."

"Ah, foosh, mon! If you hadn't brought the stuff out, somebody else would have. It's not your fault that we don't have the kind of economy to absorb it smoothly."

"All right," said Arch without tone. "I'll join your minute men. There doesn't seem to be anything else to do."

THE WAVE of automobiles began coming around noon of the next day. Westfield lay off the main highway, so it didn't get the full impact of the jam which tied up traffic from Philadelphia to Boston; but there were some thousands of cars which passed through.

Arch stood in the ranks of men who lined Main Street. The gun felt awkward in his hands. Breath smoked from his nostrils, and the air was raw and damp. On one side of him was Mr. Hinkel, bundled up so that only the glasses and a long red nose seemed visible; on the other was a burly farmer whom he didn't know.

Outside the city limits a sign had been planted, directing traffic to keep moving and to stay on the highway. There were barriers on all the side streets. Arch heard an occasional argument when someone tried to stop, to be urged on by a guard and by the angry horns behind him.

"But what'll they do?" he asked blindly. "Where will they stay? My God, there are women and children in those cars!"

"Women and children here in

town too," said Hinkel. "We've got to look after our own. It won't kill these characters to go a few days without eating. Every house here is filled already—there've been refugees trickling in for weeks."

"We could bunk down a family in our place," ventured Arch.

"Save that space," answered Hinkel. "It'll be needed later."

Briefly, a certain pride rose through the darkness of guilt which lay in Arch. These were the old Americans, the same folk who had stood at Concord and gone west into Indian country. They were a survivor type.

But most of their countrymen weren't, he realized sickly. Urban civilization had become too big, too specialized. There were people in the millions who had never pitched a tent, butchered a pig, fixed a machine. What was going to become of them?

Toward evening, he was relieved and slogged home, too numb with cold and weariness to think much. He gulped down the dinner his wife had ready and tumbled into bed.

It seemed as if he had not slept at all when the phone was ringing. He groped toward it, cursing as he tried to unglue his eyes. Culquhoun's voice rattled at him:

"You and Betty come up to the college, Somerset Hall, right away. There's hell to pay."

"How—?"

"Our lookout on the water tower has seen fires starting to the south. Something's approaching, and it doesn't look friendly."

Sleep drained from Arch and he stood in a grayness where Satan jeered at him: *"Si monumentum requiris, circumspice!"* Slowly, he nodded. "We'll be right along."

The campus was jammed with townspeople. In the vague predawn light, Arch saw them as a moving river of white, frightened faces. Farmer, merchant, laborer, student, teacher, housewife, they had all receded into a muttering anonymity through which he pushed toward the steps of the hall. The irregular militia was forming ranks there, with Culquhoun's shaggy form dominating the scene.

"There you are," he snapped. "Betty, can you help take charge of the women and children and old people? Get them inside—this one building ought to hold them all, with some crowding. Kind of circulate around, keep them calm. We'll pass out coffee and doughnuts as soon as the Salvation Army bunch can set up a canteen."

"What's the plan?" asked a guardsman. To Arch, his voice had a dim dreamlike quality, none of this was real, it couldn't be.

"I don't know what those arsonists intend or where they're bound," said Culquhoun, "but we'd better be ready to meet them. The traffic through town stopped completely a few hours ago—I think there's a gang of highwaymen operating."

"Colin, it can't be! Plain people like us—"

"Hungry, frightened, angry, desperate, confused people. A mob has nothing to do with the individuals in it, my friend. And one small push is enough to knock down a row of dominoes. Once lawlessness

really gets started, a lot of others are driven into it in self-defense."

They waited. The sun came up, throwing a pale bleak light over the late snow and the naked trees. The canteen handed out a sort of breakfast. Little was said.

At nine-thirty, a boy on a clumsy plowhorse came galloping up toward them. "About a hundred, marching down the highway," he panted. "They threw a couple shots at me."

"Stay here," said Culquhoun. "I'm going down to see if we can't parley. I'll want about ten men with me. Volunteers?"

Arch found himself among the first. It didn't matter much what happened to him, now when the work of his hands was setting aflame homes all across the land. They trudged down the hillside and out toward the viaduct leading south. Culquhoun broke into a deserted house and stationed them in its entrance hall.

Peering out, Arch saw the ragged column moving in. They were all men, unshaven and dirty. A few trucks accompanied them, loaded with a strange mass of plunder, but most were on foot and all were armed.

Culquhoun bound a towel to his rifle barrel and waved it through the front door. After what seemed like a long time, a voice outside said: "Okay, if yuh wanna talk, go ahead."

"Cover me," murmured Culquhoun, stepping onto the porch. Looking around his shoulder, Arch made out three of the invaders, with their troop standing in tired, slumped attitudes some yards behind. They didn't look fiendish, merely worn and hungry.

"Okay, pal," said the leader. "This is O'Farrell's bunch, and we're after food and shelter. What can yuh do for us?"

"Food and shelter?" Culquhoun glanced at the trucks. "You seem to've been helping yourselves pretty generously already."

O'Farrell's face darkened. "What'd yuh have us do? Starve?"

"You're from the Boston area, I suppose. You could have stayed there."

"And been blown off the map!"

"It hasn't happened yet," said Culquhoun mildly. "It's not likely to happen, either. They have organized relief back there, you didn't have to starve. But no, you panicked and then you turned mean."

"It's easy enough for yuh to say so. *Yuh're* safe. We're here after our proper share, that's all."

"Your proper share is waiting in Boston," said Culquhoun with a sudden chill. "Now, if you want to proceed through our town, we'll let you; but we don't want you to stay. Not after what you've been doing lately."

O'Farrell snarled and brought up his gun. Arch fired from behind Culquhoun. The leader spun on his heel, crumpled, and sagged with a shriek. Arch felt sick.

His nausea didn't last. It couldn't, with the sudden storm of lead which sleeted against the house. Culquhoun sprang back, closing the door. "Out the rear!" he snapped. "We'll have to fight!"

They retreated up the hill,

crouching, zigzagging, shooting at the disorderly mass which milled in slow pursuit. Culquhoun grinned savagely. "Keep drawing 'em on, boys," he said as he knelt in the slush and snapped a shot. "If they spread through town, we'll have hell's own time routing 'em all out—but this way—"

Arch didn't know if he was hitting anything. He didn't hear the bullets which must be whining around him—another cliché that just wasn't true, he thought somewhere in the back of his head. A fight wasn't something you could oversee and understand. It was cold feet, clinging mud, whirling roaring confusion, it was a nightmare that you couldn't wake up from.

Then the rest of the Westfield troop were there, circling around to flank the enemy and pumping death. It was a rout—in minutes, the gang had stampeded.

Arch leaned on his rifle and felt vomit rising in his throat. Culquhoun clapped his shoulder. "Ye did richt well, laddie," he rumbled. "No bad at all."

"What's happening?" groaned Arch. "What's become of the world?"

Culquhoun took out his pipe and began tamping it. "Why, a simple shift of the military balance of power," he answered. "Once again we have cheap, easily operated weapons which everyone can own and which are the equal of anything it's practical for a government to use. Last time it was the flintlock musket, right? And we got the American and French Revolutions. This time it's capacitite.

"So the Soviet dictatorship is doomed. But we've got a rough time ahead of us, because there are enough unstable elements in our own society to make trouble. Our traditional organizations just aren't prepared to handle them when they're suddenly armed.

"We'll learn how fast enough, I imagine. There's going to be order again, if only because the majority of people are decent, hard-working fellows who won't put up with much more of this sort of thing. But there has to be a transition period, and what counts is surviving that."

"If I hadn't—Colin, it's enough to make a man believe in demoniac possession."

"Nonsense!" snorted the other. "I told you before, if you hadn't invented this stuff, somebody else would have. It wasn't you that made it by the ton, all over the country. It wasn't you that thought up this notion of finishing the Iron Curtain governments—a brilliant scheme, I might add, well worth whatever price we have to pay at home.

"But it *is* you, my boy, who's going to have to get us tooled up to last the transition. Can you do it?"

FUNDAMENTAL changes are seldom made consciously. Doubtless the man in the fifth-century Roman street grumbled about all these barbarian immigrants, but he did not visualize the end of an empire. The Lancashire industrialist who fired his crafts-

men and installed mechanical looms was simply making a profitable investment. And Westfield, Massachusetts, was only adopting temporary survival measures.

They didn't even look overwhelmingly urgent. Government had not broken down: if anything, it was working abnormally hard. News came through—ferocious air battles over the Canadian tundras; the Soviet armies rolling westward into Europe and southward into Asia, then pushed back with surprising ease and surrendering en masse as their own states collapsed behind them—it was turning out to be a war as remote and half-forgotten as Korea, and a much easier one, which lasted a few months and then faded into a multi-cornered struggle between communists, neo-czarists, and a dozen other elements. By Christmas time, a shaky democratic confederation in Moscow was negotiating with Ukrainia, the Siberian Convict Republic, and the Tartar Alliance. China was in chaos and eastern Europe was free.

And while the great powers were realizing that they were no longer great, now that a vast capital investment in armament had stopped paying off; and while they sought to forestall world upheaval by setting up a genuine international army with strength to enforce the peace—life went on. People still had to eat.

Arch stood by Hinkel's watermill in the early spring. The ground glistened and steamed with wetness underfoot, sunlit clouds raced through a pale windy sky, and a mist of green was on the trees. Near him the swollen millstream roared and brawled, the wheel flashed with its own swiftness, and a stack of capacitors lay awaiting their charges.

"All right," he said. "We've got your generator going. But it isn't enough, you know. It can't supply the whole country; and power lines to the outside are down."

"So what do we do?" asked Hinkel. He felt too proud of his new enterprise to care much about larger issues at the moment.

"We find other sources to supplement," said Arch. "Sunlight, now. Approximately one horsepower per square yard, if you could only get at it." He raised a face grown thin with overwork and with the guilt that always haunted him these days, up to the sky. The sun felt warm and live on his skin. "Trouble is, the potential's so low. You've got to find a way to get a high voltage out of it before you can charge a capacitor decently. Now let me think—"

He spent most of his waking hours thinking. It helped hold off the memory of men lying dead on a muddy hillside.

When power was short, you couldn't go back to oxcarts and kerosene lamps. There weren't enough of either. The local machine shop made and sold quantities of home charging units, small primitive generators which could be turned by any mechanical source, and treadmills were built to drive them. But this was only an unsatisfactory expedient. Accompanied by several armed guards, Arch made a trip to Boston.

The city looked much quieter than he remembered, some of the streets deserted even at midday, but a subdued business went on. Food was still coming in to the towns, and manufactured goods flowing out; there was still trade, mail, transportation. They were merely irregular and slightly dangerous.

Stopping at M.I.T. Arch gave certain of his problems to the big computer, and then proceeded to an industrial supply house. The amount of selenium he ordered brought a gasp and a hurried conference.

"It will take some time to get all this together," said a vice-president. "Especially with conditions as they are."

"I know," said Arch. "We're prepared to make up truck convoys and furnish guards; what we want you for is negotiation."

The vice-president blinked. "But . . . good heavens, man! Is your whole community in on this?"

"Just about. We have to be. There's little help coming in from outside, so our area is thrown back on itself."

"Ah—the cost of this operation—"

"Oh, we can meet that. Special assessment, voted at the last town meeting. They don't care very much, because money has little value when you can't buy more than the rationed necessities. And they're getting tired of going on short rations of power."

"I shouldn't say this, because your proposal is a fine deal for us, but have you stopped to think? Both the REA and the private power concerns will be restoring service eventually, just as soon as civil order has been recreated."

Arch nodded. "I know. But there are two answers to that. In the first place, we don't know when that'll be, and if we don't have adequate energy sources by winter we'll be up the creek. Also, we're building a sun-power plant which will cost almost nothing to operate. In the long run, and not so terribly long at that, it'll pay off."

Bob Culquhoun, who went on the selenium convoy, reported an adventurous journey through hundreds of miles where gangs of extremists still ruled. "But they seem to be settling down," he added. "Nobody likes to be a bandit, and anyhow the state militias are gradually subduing 'em. Most of the rural communities, though, are striking out on their own like us. There's going to be a big demand for selenium." Wistfulness flickered in his eyes. "Wonder if I can raise enough money to buy some stock?"

"It'll take time," said Elizabeth. "I know the sun-power generator is simple, but you still can't design and build one overnight."

As a matter of fact, fall had come again before Westfield's plant was in full operation. It didn't look impressive: great flat screens on top of hastily constructed buildings, and inside these the apparatus to raise voltage and charge capacitors. But in conjunction with the watermill, it furnished more than enough electricity to run the county's machines.

Arch was kept busy all that summer, directing, advising, helping. It

seemed that everybody had some scheme of his own for using capacitite. Energy cost nothing, and machinery could be built from junkyard scrap if nothing else. Westfield was suddenly acquiring her own looms, mills, even a small foundry. Bob led a gang of young hellions who made an airplane and kept it aloft for days at a time. His father promptly confiscated it for the use of the civic guard, and after that there were no more surprise brushes with roving outlaws.

An eyewitness report was brought in from the air—a clash between state troops and one of the robber bands which still existed to the north. The gangmen had their own trucks and jeeps, their own guns, all operating off accumulators which could be charged at any of a thousand watermills. A rifleman could stop a tank, and aircraft were of limited value against guerrillas who crouched in brush and weeds. The battle was a draw, with both sides finally retreating.

Arch shuddered, alone with Elizabeth, and crept into her arms. "Did I do that?" he asked through his tears. "Did I do it?"

"No, darling," she said. One hand ruffled his disordered hair. "Can't you forget that side of it? Think of what you have done, with your own hands—built this town up again, given its people more than they ever had before."

He set his teeth. "I'll try," he said.

Somewhat later, the government offered amnesty to those outlaws who would lay down their arms and come home. It had the desired effect; they had had enough of warring and insecurity. But Culquhoun scowled. " 'Tis a vurra bad precedent," he said. "Only a weak government makes such a move."

Oddly, Arch felt a lightening within himself. "Maybe a weak government is what we need," he answered.

News: Several southern states threaten secession unless court decisions concerning racial equality are withdrawn.

News: Uprisings in these same states. The Negro has had enough.

News: Capitulation of state governments. Constitutional conventions, transfer of power from state to local authorities.

News: The depression is not ending, but transforming itself: out-of-work men are starting to produce things for themselves with the help of capacitite-driven machinery often made at home, trading their surplus for whatever else they need. A mobile reclamation unit appears, costing little to operate, and families begin to irrigate and colonize desert areas. Big business, big labor, big government talk much and do nothing effective—their day is past, but they simply cannot understand the new forces at work.

News: More and more city areas are becoming empty as their inhabitants take advantage of cheap, fast transportation and move into the rapidly expanding suburbs and even into the country. This migration is possible because with present energy sources, plastic board for home construction can be manu-

factured at very low cost.

News: There is a great deal of debate in Washington about redistricting to meet the new population pattern. It doesn't seem too important, though, because a land of nearly self-sufficient communities, such as this is becoming, is much less dependent on central government.

News: Experiment and innovation in dress, work habits, manners and morals, grows ever more common. The basic cause of this is that few men need now be afraid of what the neighbors or the boss thinks. If you don't like it where you are, you can easily go elsewhere and start over.

None of this happened at once. It would take a century or more for the change to complete itself. But even in the second year, the trend was obvious.

SNOW whirled against the house, blindingly, as if the world drew into itself and nothing lay beyond these walls. The muted skirl of wind came through, lonesome and shivering. But inside, there was warmth and a calm light.

Arch sat with a whiskey and soda in his hand, looking across the floor at his wife. He felt tired, but there was a relaxation in him, a sense of labor finished.

Not fully—there would be much to do yet. But power was there, machinery was there, food stored away; they would last the winter, and there would be another springtime.

"It's settling down," Elizabeth told him, putting her news magazine aside. "For once, I agree with the editor of this rag. The crisis is over, and now it's a matter of readjustment. The world is never going to be the same, but it'll be a better one . . . cleaner."

"Perhaps," said Arch. He didn't feel so sharply the horror of guilt, not any more.

"Look around you," she invited. "Look what you've done. I'm afraid, dear, that you're going to be rediscovered. It won't take long before people suddenly wake up to the fact that your invention did all this for them. Brace yourself—you're going to be famous for life."

Arch winced. "But I didn't!" he protested. "They did it for themselves. One man never could—"

"I quite agree," she smiled. "One man can neither make nor destroy a society. So why not give that conscience of yours a rest?"

"There's been suffering," he said, enough alcohol in him to break down his reserve. "People have died."

"A lot of them needed killing," she said earnestly. "Look what we've got. An end to dictatorship. Removal of the atomic-war threat. Cheap energy for a million new projects. A four-hour work day in prospect. Government, which was getting too big and officious in all countries, cut down to size again. The plain man standing on his own feet and working for himself. Natural resources conserved. If you must take either credit or blame, Si, then balance your books!"

"I know," he said. "I know all

that, up in my conscious mind. But down underneath—I'll always see those houses burning, and those men shooting at each other."

"You—" She hesitated. "I know what you need. Your trouble, my boy, is that underneath that Yankee conservatism, you're a hopeless romantic. Your mind dwells on the sudden and dramatic. Now the positive benefits of capacitite aren't anywhere near as quick and spectacular as the temporary evils were. What you have to do, to satisfy those Puritan chromosomes, is to produce something really big and fancy, something of immediate, large value."

He chuckled, lifted out of his dark mood in spite of himself. "I imagine you're right, Dr. Freud," he said. "But what?"

"I don't know." She frowned with worry for him. "But think, man. We have leisure now—in another year or so, well, we won't be the millionaires we once dreamed of, but like everybody else we'll have real security and real time to ourselves. You could use that time to work on *something.*"

"Hm—" Automatically, his brain turned to practicalities. "Let's see, now. Capacitite offers a way of concentrating energy enormously . . . a very small packet will hold a hell of a lot—*My God!*" His yell shook the windows as he leaped to his feet.

"What the devil—something wrong?" Elizabeth got up too.

"No!" He was running toward the phone. "Got to get hold of Colin—M.I.T.—don't you see, darling?" His hands trembled as he dialed, but there was laughter in his voice. "Don't you see it? Spaceships!" • • •

Don't miss the brilliant June issue of IF . . .

THE STRANGERS

By Algis Budrys

HAVE YOU seen the *strangers?* If not, be careful; you might meet one today or tomorrow or the day after. Or—maybe you are one yourself! *Maybe* your mortal self is only a chrysalis for one of those souls lost in time, using you, while it waits, waits and waits—until the tunnel opens up and the thousands of years are over! . . . It's one of the year's most exciting science fiction stories.
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Illustrated by Kelly Freas

Discontent was brewing aboard the R. S. S. Indefeasible. *And Captain Gorbel, a proud "basic" man, could cope with it . . . But Mother Earth turned the tables!*

WATERSHED

THE MURMURS of discontent —Capt. Gorbel, being a military man, thought of it as "disaffection"—among the crew of the R.S.S. *Indefeasible* had reached the point where they could no longer be ignored, well before the ship had come within fifty light years of its objective.

Sooner or later, Gorbel thought, this idiotic seal-creature is going to notice them.

Capt. Gorbel wasn't sure whether he would be sorry or glad when the Adapted Man caught on. In a way, it would make things easier. But it would be an uncomfortable moment; maybe it would be better to keep sitting on the safety valve until Hoqqueah and the other Altarians were put off on—what was its name again?—Oh yes, Earth.

But the crew plainly wasn't going to let Gorbel put it off that long.

As for Hoqqueah, he didn't appear to have a noticing center anywhere in his brain. He was as little discommoded by the emotional undertow as he was by the thin and frigid air the Rigellian crew maintained inside the battlecraft. Secure in his coat of warm blubber, his eyes brown, liquid and merry, he sat in the forward greenhouse for most of each ship's day, watching the growth of the star Sol in the black skies ahead.

BY JAMES BLISH

And he talked. Gods of all stars, how he talked! Capt. Gorbel already knew more about the ancient—the *very* ancient—history of the seeding program than he had had any desire to know. Nor was the seeding program Hoqqueah's sole subject. The Colonization Council delegate had had a vertical education, one which cut in a narrow shaft through many different fields of specialization—in contrast to Gorbel's own training, which had been spread horizontally over the whole subject of spaceflight without more than touching anything else.

Hoqqueah seemed to be making a project of enlarging the Captain's horizons, whether he wanted them enlarged or not.

"Take agriculture," he was saying at the moment. "This planet we're to seed provides an excellent argument for taking the long view of farm policy. There used to be fertile jungles there; but the people began their lives as farmers with the use of fire, and they killed themselves off in the same way."

"How?" Gorbel said automatically. Had he remained silent, Hoqqueah would have gone on anyhow; and it didn't pay to be impolite to the Colonization Council, even by proxy.

"In their own prehistory, fifteen thousand years before their official zero date, they cleared farmland by burning it off. Then they would plant a crop, harvest it, and let the jungle return. Then they burned the jungle off and went through the cycle again. At the beginning, they wiped out the greatest abundance of game animals Earth was ever to see, just by farming that way. Furthermore, the method was totally destructive to the topsoil.

"Even after they achieved spaceflight, that method of farming was standard in most of the remaining jungle areas—even though the bare rock was showing through everywhere by that time."

Hoqqueah sighed. "Now of course, there's nothing but desert, naked rock, bitter cold, and thin, oxygen-poor air—or so the people would view it, if there were any of them left."

Gorbel shot a glance at the hunched back of Lt. Averdor, his adjutant and navigator. Averdor had managed to avoid saying so much as one word to Hoqqueah or any of the other panatropists from the beginning of the trip. Of course he wasn't required to assume the diplomatic burdens involved—those were Gorbel's crosses—but the strain of dodging even normal intercourse with the sealmen was beginning to tell on him.

Yet it was certainly beyond Gorbel's authority to order Averdor to speak to an Adapted Man. He had suggested that Averdor run through a few mechanical courtesies, for the good of the ship. The only response had been one of the stoniest stares Gorbel had ever seen.

And the worst of it was that Gorbel was, as a human being, wholly on Averdor's side.

"After a certain number of years, conditions change on *any* planet," Hoqqueah babbled solemnly, waving a flipper-like arm. He was working back to his primary ob-

session: the seeding program. "It's only logical to insist that man be able to change with them—or, if he can't do that, he must establish himself somewhere else. Suppose he had colonized only the Earthlike planets? Not even those planets *remain* Earthlike forever, not in the biological sense."

"Why would we have limited ourselves to Earthlike planets in the first place?" Gorbel said. "Not that I know much about the place, but the specs don't make it sound like an optimum world."

"To be sure," Hoqqueah said, though as usual Gorbel didn't know which part of his own comment Hoqqueah was agreeing to. "There's no survival value in pinning one's race forever to one set of specs. It's only sensible to go on evolving with the universe, to stay independent of such things as the aging of worlds, or the explosions of their stars. Man exists now in so many forms that there's always a refuge *somewhere* for any threatened people. That's a great achievement—compared to it, what price the old arguments about sovereignity of form?"

"What, indeed?" Gorbel said, but inside his skull his other self was saying: Ah-ha, he smells the hostility after all. Once an Adapted Man, always an Adapted Man—and always fighting for equality with the basic human form. But it's no good, you seal-snouted bureaucrat. You can argue for the rest of your life, but your whiskers will always wiggle when you talk.

And obviously you'll never stop talking.

"And as a military man yourself, you'd be the first to appreciate the advantages, Captain," Hoqqueah added earnestly. "Using panatropy, man has seized thousands of worlds that would have been inaccessible to him otherwise. He can take most of the galaxy under occupation *without* stealing anyone else's planet in the process. An occupation without dispossession—without bloodshed. Yet if some race other than man should develop imperial ambitions, and try to annex *our* planets, it will find itself enormously outnumbered."

"That's true," Capt. Gorbel said, interested in spite of himself. "It's probably just as well that we worked it out before somebody else thought up the method. But, how come it *was* us? Seems to me that the first race to invent it should've been a race that already had it—if you follow me."

"Not quite, Captain. If you will give me an example—?"

"Well, we scouted a system once where there was a race that occupied two different planets, not both at the same time, but back and forth," Gorbel said. "They had a life-cycle that had three different forms. In the first form they'd winter over on the outermost of the two worlds. Then they'd change to another form that could cross space, mother-naked, without ships, and spend the rest of the year on the inner planet in the third form. Then they'd change back into the second form and cross back to the colder planet.

"It's a hard thing to describe.

But the point is, this wasn't anything they'd worked out; it was natural to them. They'd evolved that way." He looked at Averdor again. "The navigation was tricky around there during the swarming season."

Averdor failed to rise to the bait.

"I see; the point is well taken," Hoqqueah said, nodding with grotesque thoughtfulness. "But let me point out to you, Captain, that being already able to do a thing doesn't aid you in thinking of it as something that needs to be perfected. Oh, I've seen races like the one you describe, too—races with polymorphism, sexual alteration of generation, metamorphosis of the insect life-history type, and so on. But why should any of them think of form-changing as something extraordinary, and to be striven for? It's one of the commonplaces of their lives, after all."

A small bell chimed in the greenhouse. Hoqqueah got up at once, his movements precise and almost graceful despite his tubbiness. "Thus endeth the day," he said cheerfully. "Thank you for your courtesy, Captain."

He waddled out. He would, of course, be back tomorrow.

And the day after that.

And the next day—unless the crewmen had tarred and feathered the whole bunch by then.

If only, Gorbel thought distractedly, the damned Adapts weren't so quick to abuse their privileges! As a delegate of the Colonization Council, Hoqqueah was a person of importance, and could not be barred from entering the greenhouse except in an emergency. But didn't the man know he shouldn't abuse the privilege on a ship manned by basic-form human beings, most of whom could not enter the greenhouse at all without a direct order?

And the rest of the panatropists were just as bad. As passengers, they could go almost anywhere in the ship that the crew could go—and they did, persistently and unapologetically, as though moving among equals. Legally, that was what they were—but didn't they know that there was such a thing as prejudice? And that among common spacemen the prejudice—against any Adapted Man—always hovered near the borderline of bigotry?

There was a slight hum as Averdor's power chair swung around to face the Captain. Like most Rigellian men, the Lieutenant's face was lean and harsh, and the starlight in the greenhouse did nothing to soften it; but to Capt. Gorbel, to whom it was familiar down to its last line, it looked especially forbidding now.

"Well?" he said.

"I'd think you'd be fed to the teeth with that freak by this time," Averdor said without preamble. "Something's got to be done, Captain, before the crew gets so surly that we have to start handing out brig sentences."

"I don't like know-it-alls any better than you do," Gorbel said grimly. But the man's a delegate of the Council. He's got a right to be up here if he wants to."

"You can bar him from the

greenhouse in an emergency—"

"I fail to see any emergency," Gorbel said stiffly.

"This is a hazardous part of the galaxy—potentially, anyhow. That star up ahead has nine planets besides the one we're supposed to land on, and I don't know how many satellites of planetary size. Suppose somebody on one of them lost his head and took a crack at us as we went by?"

Gorbel frowned. "That's reaching for trouble. Besides, the area's been surveyed recently—at least once—otherwise we wouldn't be here."

"A sketch job. It's still sensible to take precautions. If there should be any trouble, there's many a Board of Review that would call it risky to have unreliable second-class human types in the greenhouse when it breaks out."

"You're talking nonsense."

"Dammit, Captain, read between the lines a minute," Averdor said harshly. "I know as well as you do that there's going to be no trouble that we can't handle. And that no reviewing board would pull a complaint like that on *you* if there were. I'm just trying to give you an excuse to use on the seals."

"I'm listening."

"Good. The *Indefeasible* is the tightest ship in the Rigellian navy, her record's clean, and the crew's morale is almost a legend. We can't afford to start gigging the men for their personal prejudices—which is what it will amount to, if those seals drive them to breaking discipline."

"I can hear myself explaining that to Hoqqueah."

"You don't need to," Averdor said doggedly. "You can tell him, instead, that you're going to have to declare the ship on emergency status until we land. That means that the panatrope team, as passengers, will have to stick to their quarters. It's simple enough."

It was simple enough, all right. And decidedly tempting.

"I don't like it," Gorbel said. "Hoqqueah may be a know-it-all, but he's not entirely a fool. He'll see through it easily enough."

Averdor shrugged. "It's your command," he said. "I don't see what he could do about it. All he could report to the Council would be a suspicion—and they'd probably discount it. Everybody knows that these second-class types are quick to think they're being persecuted."

"I see what you mean," Gorbel said. "Well, I'll think about it."

BUT THE next ship's day, when Hoqqueah returned to the greenhouse, Gorbel still had not made up his mind. The very fact that his own feelings were on the side of Averdor and the crew made him suspicious of Averdor's "easy" solution. The plan was tempting enough to blind a man to flaws that might otherwise be obvious.

The Adapted Man settled himself comfortably and looked out through the transparent metal. "Ah," he said. "Our target is bigger now, eh, Captain? Think of it: in just a few days now, we will be

—in the historical sense—home again."

Now it was riddles! "What do you mean?" Gorbel said.

"I'm sorry; I thought you knew. Earth is the home planet of the human race, Captain. There is where the basic form evolved."

Gorbel considered this unexpected bit of information cautiously. Even assuming that it was true—and it probably was, that would be the kind of thing Hoqqueah would know about a planet to which he was assigned—it didn't seem to make any special difference in the situation. But Hoqqueah had obviously brought it out for a reason. Well, he'd be trotting out the reason, too, soon enough; nobody would ever accuse the Altarian of being taciturn.

"Yes, there's where it all began," Hoqqueah said. "Of course, at first it never occurred to those people that they might produce pre-adapted children. They went to all kinds of extremes to adapt their environment instead, or to carry it along with them. But they finally realized that with the planets, such a system won't work. You can't spend your life in a spacesuit, or under a dome, either.

"Besides, they had form trouble in their society from their earliest days. For centuries they were absurdly touchy over minute differences in coloring and shape, and even in thinking. They had regime after regime that tried to impose its own concept of the standard citizen on everybody, and enslaved those who didn't fit the specs."

Abruptly, Hoqqueah's chatter began to make Gorbel uncomfortable. It was becoming easier and easier to sympathize with Averdor's determination to ignore the Adapted Man's existence entirely.

"It was only after they'd painfully taught themselves that such differences really don't matter, that they could go on to panatropy," Hoqqueah said. "It was the logical conclusion. Of course, a certain continuity of form had to be maintained, and has been maintained to this day. You cannot totally change the form without totally changing the thought processes. If you give a man the form of a cockroach, as one ancient writer foresaw, he will wind up thinking like a cockroach, not like a human being. We recognized that. On worlds where only extreme modifications of the human form would make it suitable—for instance, a planet of the gas giant type—no seeding is attempted. The Council maintains that such worlds are the potential property of races other than the human, races whose psychotypes would not have to undergo radical change in order to survive there."

Dimly, Capt. Gorbel saw where Hoqqueah was leading him. The seal-man, in his own maddeningly indirect way, was arguing his right to be considered an equal in fact, as well as in law. He was arguing it, however, with facts whose validity he alone knew and whose relevance he alone could judge. He was, in short, loading the dice, and the last residues of Gorbel's tolerance were evaporating rapidly.

"Of course there was resistance

back there at the beginning," Hoqqueah said. "The kind of mind, that had only recently been persuaded that men with melanin in their skins are human beings, was quick to take the attitude that an Adapted Man—any Adapted Man—was the social inferior of the 'primary' or basic human type, the type that lived on Earth.

"You see, Captain, all this might still have been prevented, had it been possible to maintain that attitude that belief that changing the form, even in part, makes a man less of a man than he was in the 'primary' state. But the day has come when that attitude is no longer tenable—a day that is the greatest of all moral watersheds for our race, the day that is to unite all our divergent currents of attitudes toward each other into one common reservoir of brotherhood and purpose. You and I are very fortunate to be on the scene to see it."

"Very interesting," Gorbel said coldly. "But those things happened a long time ago, and we know very little about this part of the galaxy these days. Under the circumstances—which you'll find clearly written out in the log, together with the appropriate regulations—I'm forced to place the ship on emergency alert beginning tomorrow, and continuing until your team disembarks. I'm afraid that means that henceforth all passengers will be required to stay in quarters."

Hoqqueah turned and arose. His eyes were still warm and liquid, but there was no longer any trace of merriment in them.

"I know very well what it means," he said. "And to some extent I understand the need—though I had been hoping to first see the planet of our birth from space. But I don't think *you* quite understood *me*, Captain. The moral watershed of which I spoke is not in the past. It is now. It began the day that the Earth itself became no longer habitable for the so-called basic human type. The flowing of the streams toward the common reservoir will become bigger and bigger, as word spreads through the galaxy that Earth itself has been seeded with Adapted Men. With that news will go a shock of recognition—the shock of realizing that the 'basic' types are now, and have been for a long time, a very small minority, despite their pretensions."

Was Hoqqueah being absurd enough to threaten—an unarmed, comical seal-man shaking a fist at the captain of the *Indefeasible?* Or—

"Before I go, let me ask you this one question, Captain. Down there is your home planet, and my team and I will be going out on its surface before long. Do you dare to follow us out of the ship?"

"Why should I?" Gorbel said.

"Why, to show the superiority of the basic type, Captain," Hoqqueah said softly. "Surely you cannot admit that a pack of seal-men are your betters, on your own ancestral ground!"

He bowed and went to the door. Just before he reached it, he turned

(Continued on page 103)

Illustrated by Paul Orban

EASY DOES IT

Hal was stranded in the wilderness with a beautiful girl, and it was surprisingly enjoyable—while his conditioning was off. But, after all, how uncivilized can one get?

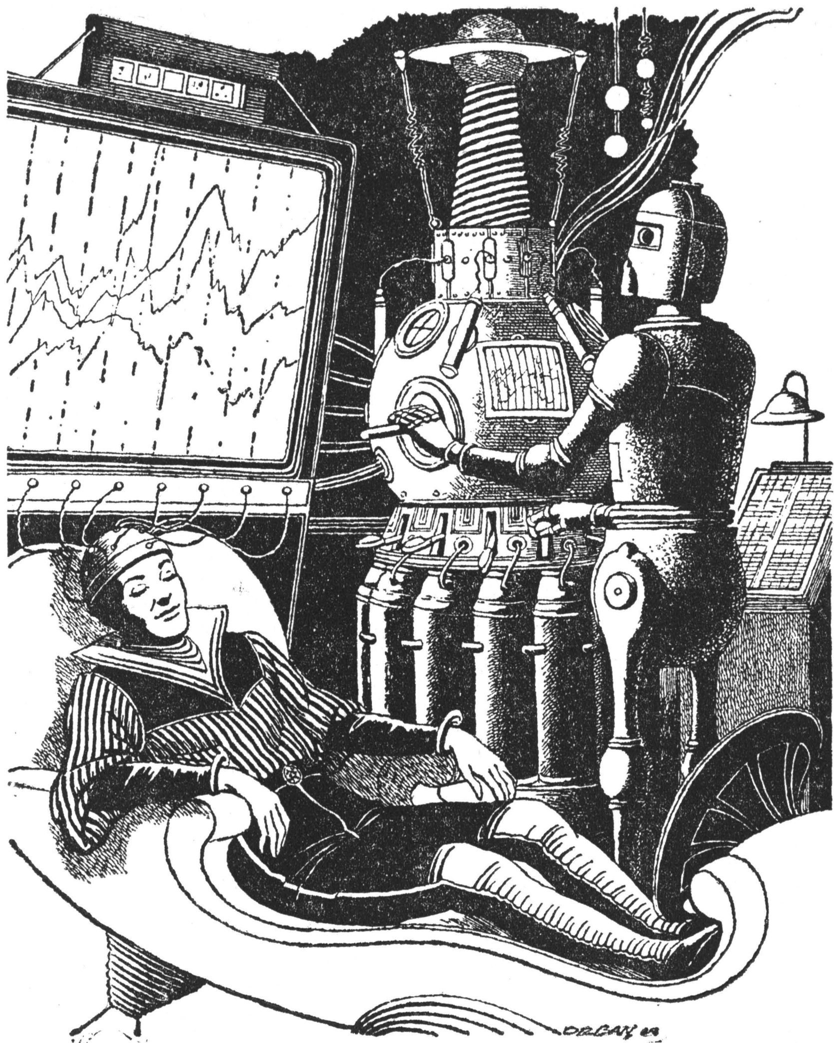
BY E. G. VON WALD

HAL WEBBER leaned back in the soft Formair Executive's seat. Although he twisted and shifted his position restlessly, he received the same sensation of perfect, comfortable support no matter which way he sat in it. Which was only natural, of course. Formair was the best suspend-field furniture manufactured.

As he squirmed about, he had a faint, puzzled frown on his face, and in his stomach he felt a lurking sensation of unaccustomed tension. Hal simply could not understand it.

There was a faint humming sound, as the door panel slid back. His father entered the office.

"Well Hal," the old man murmured softly with



a placid smile of satisfaction. "We've done it."

"Done what? Oh, you mean the new coloration process?"

"Yes. It will quintuple the net value of the family fortune within a year. We may be the richest people in the world then."

"That's nice," Hal said mildly.

His father flicked a finger across a sensitive spot on the front of the desk and relaxed as a perfect

Formair attendant's chair sprang into existence to fit his gross, soft body.

"Yes indeed," he said with a mild sigh. "It's been a long, long time that we've been working for that. Worked mighty hard, too."

"That's right," murmured Hal, a little more forcefully than necessary. "Splendid."

His father's eyebrows rose at the unusual emphasis, but he was much too cultured to question the point. He continued along the lines of the conversation already started. "We'll have to do something for Bruchner. He has been of tremendous assistance on that project. Did it practically all by himself. He is a very intelligent man, even if he is an Outlander."

"Bruchner," said Hal with mild irritation. "All I hear around here lately is Bruchner. What is he, anyway? Nothing but a savage."

"Eh?" said his father softly, raising his eyebrows again in polite inquiry.

"If Bruchner is such a brilliant fellow, why doesn't he take the Treatment and become civilized? I sometimes get a little tired of an employee who tells me I'm wrong all the time."

"But he is almost always right when he makes such statements, Hal," Webber pointed out mildly. "For instance, just the other day I asked him about the color range to be used with the new process on the Formair Skydome. He stated flatly that blue was a normal color for sky. Just like that. I was a little startled, of course, at his lack of courtesy. But after I thought it over a while, blue did seem to be a nice color for sky."

"Aaa, blue," Hal muttered. "What's wrong with the green we've always used in the past?"

Mr. Webber sighed and squirmed a little to get the chair into a more comfortable fit. Attendant's chairs were not quite as comfortable as the Executive type, even if they were Formair. Then he cocked an eyebrow and looked at his son with mild concern. "Hal, my boy, what's the trouble? I've never seen you so completely upset in all my life."

"I feel funny," murmured Hal. "As a matter of fact, I feel awful. Maybe there's some connection."

"Ill," the old man nodded agreeably. "Yes, I thought you looked it when I came in here. Something in the set of your mouth. Tight, sort of."

With an expression of mild surprise, Hal reached up and tentatively felt around his mouth with a cleanly manicured forefinger.

"Son," Webber murmured, "how long has it been since you had your last CC Treatment?"

"Eight years," Hal admitted. "It's a little overdue, I suppose, but surely—" His voice trailed off softly, as his mind seized upon the possibility.

"That's probably what it is," Webber replied. That was a pretty definite statement for someone to make about another's sensations, but anyone could see that the old man was concerned over his son. "Five years is the standard period at your age. Why haven't you taken it?"

"Well, you know," Hal whispered. "It's that new thing they have in it now."

"Ah," said his father with comprehension. "That's right, I forgot all about that. A change. But you won't mind, really you won't. You just think you will."

"Perhaps so," Hal said, and hastily changed the subject of conversation to a less depressing topic. "The new coloration process is a real success, you say?"

"Absolutely. We can now provide flexible hue and chroma for the complete Formair line—Airchair, Aircab and Airdome. We'll be the only one who has it, and since every Proprietor on the planet will want our new equipment as fast as we turn it out, we'll put every other firm completely out of the business. I've already worked out a method so that we can convert to export goods, too, without waiting for the economic balance to be readjusted. Of course, the colonies will have to curtail a little, but we don't have to concern ourselves with them."

"Yes," agreed Hal.

"Bruchner has been very useful to us on it," the old man repeated again. "We'll have to show him we appreciate it."

Hal's mouth tightened just perceptibly at the mention of the redoubtable engineer, but he said nothing. His father continued in his soft, mild voice. "We must make him a present of something. Should it be money? Can't give him property, of course, because he isn't a citizen."

"I don't like the idea of giving an Outlander money. They get their allotments and that's enough wealth. If you give them money, they will be able to buy more than their allotment, and that could very easily upset our own economic balance, you know."

"Quite true," Webber agreed. Then he smiled with placid inspiration. "I know. We'll give him fame. We'll name the process after him."

"Well," Hal said doubtfully, "I guess that would do it."

"I think so. He's been a great help. As a matter of fact, though, most of the Outlanders are helpful. A pity they won't take the Treatments and become citizens. It seems sort of sad the way their emotions cut them up at times. Like old Tanan last month. Why, up to then he was almost like a civilized man—even without the treatments."

"I know," Hal said tonelessly. "It was his son, wasn't it?"

"Yes. Curious that the old man should be so concerned over that little unpleasantness. So his son did get a little excited and kill a Proprietor and was executed himself. No reason for his father to carry on so about it, is there? I tried to get him to take the Treatment then, but—well, after all, you can hardly expect an uncivilized Outlander to appreciate the advantages, can you?"

"No." Hal did not refer to the fact that the new element recently put into the standard CC Treatment was causing him to postpone taking it himself, but his father seemed to sense his thought.

"You won't mind it, son. Really you won't. The Treatment will take care of the whole thing. It's per-

fectly obvious that you are suffering from the effects of the delay right at this moment."

"Oh Chaos," Hal swore softly. "Why did they have to go and put that element in anyway?"

"Now Hal, you know better than that," his father chided him gently. "It was either include a marital inclination or else go in for a complete program of artificial insemination. The women have a vote too, you know, and they wouldn't hear of it. They don't object to carrying a child for a few months—that's always been in their conditioning for some reason or another. But they insisted that if they had to be mothers, the men would have to be fathers. And they insisted on a standard, civilized marriage contract to cover the situation."

"I know, I know. I've heard all the arguments. Racial suicide and all. Nonsense. We can always import Outlanders and force them to take the Treatment. Outlanders," he pointed out with suitable, mild, cultured disgust, "breed like animals."

"No son, that wouldn't do the job. We have to keep the blood line. Outlanders don't have it, you know. If they did, they would have permitted themselves to be civilized long ago."

Hal's fingers drummed nervously on the desk top, and his father again raised an eyebrow in mild concern. He shook his head thoughtfully.

Guiltily, Hal stopped his fingers from their satisfying tattoo. He bunched them into a fist instead, and then gazed at it with mild unbelief.

"All right," he finally whispered. "This is simply awful. And it looks as if in order to be cured, I'll have to get me a wife along with it. A pity, though. Everything was perfectly mild without one."

"You'll be mild with a wife, Hal," his father assured him softly. "You don't like the prospect now, because it means change. Change, of course, is always unpleasant. But the Treatment will take care of it all right. I know that I didn't expect things to work out so mildly with a wife. It was optional back in those days, and if it hadn't been for your mother's family money, I never would have married. Particularly her—with her family history of fecundity. As witnessed by the children we produced—you and your sister. But Formair needed the money, and I was the only available man in the Webber clan. When I agreed to make the sacrifice, they made me president of the firm, because it isn't often that a man will do so much for his own family. Shows real character. It's in the cultured family blood, naturally."

Hal had heard all this many, many times before, but he listened without irritation. Or at least, with only the mild irritation that was the result of his present unstable condition.

"Yes indeed," his father went on in his mild, comfortable voice. "Hardly knew she was around the house, though, once the Treatment was over with. It was just as if she had been around all my life. Marvelous process."

"All right," Hal murmured. "I'll

take it."

"Be a good idea to pick out a wife first. Sometimes there are a few minor adjustments to make because of outstanding individual characteristics. You get an absolutely perfect fit that way, you know." He stood up and walked toward the door, the flabby muscles of his body easily supporting the two pounds relative of his weight.

"The Ansermet family has a female available, I believe," he murmured as he walked. "Excellent choice. But you better have the probability checked anyway."

"I know about her," Hal replied thoughtfully. "But what's she like? Have you ever met her?"

His father smiled benignly back at him, as he practically floated through the doorway. "That doesn't matter a bit," he said mildly. "It doesn't make any difference at all what either of you are like. The Treatment will bring you both back to absolute, statistical normal, and you'll both be a perfect fit for each other. Quite pleasantly civilized."

The door hummed shut behind him.

"Well," Hal announced aloud to himself, "guess that's it."

He ordered the automatic secretary to make all suitable arrangements and then stood up. He walked to the elevator, where a soft, hissing breeze conveyed his temporary one-tenth pound relative gently up the tube to the roof. There his weight returned to its normal two pounds relative, and he spoke to the robot attendant. "My cab." His Formair Aircab was promptly and quietly delivered, and Hal stepped inside.

"Destination?" a voice inquired softly from the control bank.

"Take me to the nearest available Civilization Conditioning Treatment Center."

At once, the cab took off. It was a silent and comfortable motion. Hal had always liked flying.

The automatic pilot was speaking to him gently. "Central Authority advises that the nearest available CCT Center at this time is in the metropolis of Knoxville. This requires transversing interurban wilderness."

Hal frowned just slightly. He had never seen the interurban wilderness, of course, and had not the slightest desire to do so. That was chaos. He inquired, "How soon can the local Center take me?"

"Three days, seven hours twenty minutes from reference time. Mark time . . . mark!" the robot announced the temporal point of reference.

"Too long," Hal replied wearily. "Let's go to Knoxville. And shut off all outside views. I do not wish to see the chaos."

The Aircab obediently turned and transposed through the suspend-field of the York metropolis Airdome. It was an effortless passing, since the field that constituted the wall structure of the Aircab was exactly in phase with that of the Airdome field. Both were Formair manufacture, of course.

The pleasant, silent, effortless motion of the Aircab soon produced its usual somnolent effect on him, and he dozed comfortably off. He slept the entire trip.

At Knoxville, he spoke to the Center Technician briefly, advising the master robot of the possibility of his altered economic status, and the matter was thoroughly checked by the computor at Central Authority. Every conceivable source of psychosomatic tension and internal conflict was studied, and suitable alterations on Hal's master curve plotted. The process took ten minutes, while Hal dozed under the soothing warmth of the examination cap. There was a crackling buzz, and it was over.

He awoke immediately, and felt wonderful. No tension. No irritation. Not the slightest bit of his recent restlessness. Hal was delighted. On the way out of the cubicle, he encountered another Proprietor, and smiled at him with perfect, civilized mildness.

"York," he ordered his Aircab. Once again, the sleek button-shaped vehicle soared up through the Airdome and out over the interurban wilderness. Hal contentedly went to sleep right in the middle of the pilot's automatic rundown of flight data.

HE WAS jolted awake by a raucous rattle from the control bank. Blinking his eyes sleepily, he said, "Please stop all that noise. What is the trouble?"

A very unpleasant and notably ungentle voice replied, "Apologies sir. We are out of control. Aircrash has occurred."

Aircrash! An almost unheard-of thing that sometimes happened to people who used inferior equipment like that produced by firms other than Formair. People were even known to be killed by it.

"Report," he said quietly, then flinched a little at the raucous scratching of the speech mechanism.

"Reference point . . . mark! Altitude eleven thousand three hundred seventy one feet. Velocity reduced to two hundred nine point nine miles per hour. Locus: seven hundred point eight miles from nearest civilized metropolis, which is York." The voice continued, but became unintelligible as the mangled circuits faltered.

Seven hundred miles from civilization! Wilderness. Chaos; that settled it, of course. Hal smiled gently as he realized that he was about to die. A civilized man obviously could not be expected to survive in chaos. He observed that he was breathing more strenuously, and realized that it was the result of the rapid failure of the antigravity field. Never in his life had Hal been under the full force of the earth's mass field, but he knew the symptoms. Once he had been exposed to a one-half gee for a few hours. Very unpleasant, he recalled.

The automatic pilot's unintelligible speech suddenly stopped altogether. There was a heavy, awkward lurch that threw Hal forward against the front panel. But before he struck it, the field generator failed completely, the panel ceased to exist, and Hal was flying through the air. He shut his eyes, and placidly waited for death.

A moment later, he hit the ground sharply, rolled over and

over, and lay still.

He sighed heavily. Death? He had always fancied that death would be a complete absence of sensation, and no consciousness of effort whatever. Instead, his breath was coming in deep, heavy sighs, his head hurt, his arm was aching, and something was tickling his nose.

"Come on, wake up," a voice said briskly.

Hal opened his eyes and looked up at a golden-framed face. It was the face that had been speaking, and the pleasingly shaped lips now moved again. "You aren't hurt, you know. Just a little shaken up."

Hal continued to stare at the woman for a moment, then muttered "Umph," and struggled to a sitting posture. It was a great effort in the unaccustomed full earth gravitational field. The woman was an Outlander, no doubt about it. That was evident from her highly spirited tone of voice. But as Hal looked around at the strange picture of undisturbed interurban wilderness, he found that most astonishingly he did not mind it. As a matter of fact, he rather liked her tone of voice. It was all very puzzling.

"What happened?" he muttered heavily, his eyes moving back to the landscape and the small metal boxes which housed the now defunct suspend-field generators.

"There must have been something wrong with your Aircab," she replied. "You crashed. The same way I did a couple days ago." The woman walked over to the generator boxes, picked them up and brought them back to where he was still sitting on the grass. "We'll need these," she explained. "There are emergency supplies inside them."

Hal didn't move. She waited a moment, then said lightly, tossing her golden hair, "Come along now. We're way out in the wilderness, you know, and there aren't any robots to bring us our dinner."

"Wilderness," Hal murmured. "That's right. Well, I guess we'll die here."

"Oh nonsense!" She stamped her foot with impatience. "This would have to happen to me. Of all people to be stranded with in the wilderness, I have to get one of you insipid, gutless Proprietors."

"Oh yes?" Hal said with unconscious anger, lurching to his feet. "Who's insipid and gutless? I'm considerably more civilized than you are." Quick surprise crossed her face as she listened. Hal continued his angry speech. "Why is it that all you savages always think you know how to live better than your superiors? If you are so clever, why aren't you civilized?"

"Well, listen to him. You sound almost human."

She was laughing at him!

"Damn savage," he growled. He turned and strode purposefully away from her across the soft matting of grass.

"Where do you think you are going?" she called.

"Away from here," he replied. But the rapid pace in the unaccustomed gravity was very quickly taking his energy. His breath came in deep, labored gasps already, and

he could scarcely move his feet.

He stopped abruptly, and looked at the distant horizon. There was nothing in sight that indicated civilization. These regions had not been inhabited for two hundred and fifty years—ever since the severance of the planetary colonies from political control by the motherland, and the settling of the Proprietors into their well-separated, civilized cities. The land was all owned by the Proprietors, but was unnecessary, and hence not used.

He felt a light touch on his arm.

"I'm sorry," she apologized softly. "I can understand you a little, but you're so completely under the influence of your horrible personality conditioning methods that you can't possibly understand me."

"Who's under what influence?" Hal said in a valiant attempt to express his irritation, but his voice held the obvious weakness of fatigue.

"You poor boy," she sympathized. "You don't sound very much influenced by it right now."

At her words, Hal suddenly became aware of the unaccustomed vigor of his own emotions, and he was puzzled by it. But it seemed oddly unimportant for some reason. "How come you can handle this awful weight so easily?" he asked her.

Her laughter was light and delightful. "We spend most of our lives under natural conditions, not under an antigravity machine. I've only been on Earth for a few months, visiting my father. But a lot of that time was spent out here in this beautiful wilderness."

"Horrible chaos," he muttered. He glanced up and observed a mild, blue, cloud-studded sky. "Why it *is* blue, after all. Isn't it?"

"What's blue?"

"The skydome."

She glanced up thoughtfully. "Of course it's blue. And this is not one of your artificial skys. This is the real thing. There's no artificial weather control out here, you know. You get natural sunlight, natural winds, storms, rain—oh, lots of things."

"Gahh," said Hal.

"What makes you surprised at finding that the sky is blue?"

"Probably because I never saw it before. The only time I ever heard of its being anything other than green was when an engineer we have working for us at the factory said it was blue."

"Well, never mind the sky. Let's find some place where we can get a little shelter for the night." She began to lead him slowly along an animal trail to a cluster of trees on a nearby stream. She walked with the obviously delayed pace one takes with invalids, but Hal had a difficult time keeping up.

Finally, she said, "Here's a pretty good place. Sit down next to that tree. You must be worn out."

"Oooo," he groaned, reclining back against a broad, rough oak trunk, then stiffening painfully away from it again. "It doesn't fit," he mourned plaintively.

"Now you're sounding silly again," she scolded. "Go on, lean back. There aren't any suspend-field lounges out here for you, so you take what you get."

Obediently, he relaxed against the rough, twisting bark. He was very, very tired. On second thought, even this rugged seat was comfortable. He sighed heavily, and then looked pensively around again. "Oh well, what does it matter? We'll be dead soon."

"Don't talk like that!" she snapped with annoyance.

"Why?" he inquired listlessly. "Everybody knows a civilized human being can't possibly survive in the wilderness. That's why no one ever comes here. And I'd just as soon die right now, if you have anything suitable for killing."

The woman stared at him with a tight frown between her eyebrows. Then she shook her head with wonder. "How you people can call yourselves civilized is beyond me. You yourself don't seem so bad, except that you don't have any guts. They've trained it all out by now."

"Please," begged Hal. "You sound like that uncouth engineer that works for us. Impertinent."

"That what engineer?" she demanded spiritedly. "Who are you, anyway?"

"I'm Webber. Hal Webber. The engineer is a savage—oh sorry." He smiled weakly. "You're a savage, too. Guess you Outlanders don't regard yourselves as such."

"No we don't," she snapped. "And if it weren't for us, you silly fools here on Earth would have died out long ago."

"Outlanders are noted for their misplaced pride, of course," Hal commented with a mildness that was impelled by fatigue rather than civilized conditioning.

"Oh are we now?" she said angrily, standing up and bending over him. "And who do you think you are, Lord Proprietor? Some humble god, perhaps? Let me tell you something, Hal Webber, I've heard about you. You know who I am? My name is Lois Bruchner. That uncouth engineer you just referred to happens to be my father."

Hal was puzzled. "What on earth is the matter?" he asked. "Why are you so excited?"

"You called my father uncouth."

"Why get excited about that? After all—" Hal gestured weakly, trying to reason with her, "—it's only your father. I didn't say you were uncouth. Funny thing is—I like you."

"Suppose I called your father names?" she demanded, her lower lip protruding belligerently.

"You can call him anything you like as far as I am concerned."

Lois Bruchner stood there a moment, her mouth open in astonishment. Then she sat down beside him again quietly.

"That's right," she murmured, "they even educate love out of you."

Hal sighed heavily, and slid away from the tree onto the rough, rocky ground. It was painful, but he was so tired. His breath came in regular, deep sighs as he went to sleep.

BY THE TIME he woke, Lois had constructed a kind of primitive lean-to shelter over him. Hal was amazed. The sheltering purpose of the structure was evi-

dent to him, and he was startled that she should have been able to design such a thing on the spur of the moment.

She heard him stir and looked up from the fire she had built in front of the lean-to. "Hungry?" she asked.

He was ravenous, but his muscles ached in every fibre. His wonder at her cleverness disappeared abruptly when he tried to move. He rolled over groaning and helpless.

Immediately, she was at his side, pushing him back onto the bed of dry, fragrant grass she had put him on. "Now don't try to move around," she admonished. "Just a few days, and you'll be all right."

"Oooo," Hal groaned. "This is awful."

"There, there," she murmured solicitously. "I've made you some soup. You'll like it."

"Soup," he groaned. "I want food. Good solid synthomeat. Don't you have any food?"

"Solid food in your stomach so soon in this heavy gravity would kill you."

She went away and returned quickly with a little cup and spoon, and proceeded to empty the container into his lax mouth a few drops at a time. After a while, he ceased his protesting. It was less painful to swallow the slop than to fight it. Very soon afterward, he lost consciousness.

Later, he was again aware of his surroundings. He felt tremendously better, and observed with a peculiar satisfaction that it was morning. Funny sounds were in the air, which he eventually recognized as the cries of wild birds and insects. Insects? He blinked his eyes and struggled to a sitting position, and looked worriedly around. Insects can carry disease, he remembered. And wild animals were reported to be carnivorous.

His clumsy motions awakened Lois, who had been sleeping beside him. Hal looked down at her with a vague wonder. Such a nice looking savage, he thought, as she popped open her eyes. She smiled a pleased morning smile at him and lazily stretched.

"Hi," she said. "How do you feel?"

"Quite mild," Hal admitted with wonder. "Odd, too. That junk you fed me last night must have some very efficient drug in it."

"Junk I fed you last night?" Lois echoed, sitting up. Then she laughed her amusement. "Oh, you mean that soup. That wasn't last night, Hal Webber. That was last week."

"But—I just woke up," he protested.

"Yes." She smiled at him, reaching up and patting his cheek affectionately. "You've been a little delirious. Gravity trauma, very common. You get used to it fast, but that's one thing they didn't condition you to, I guess, and your conscious promptly rejected the possibility."

Sudden remembrance came to Hal of the agony it had been to move the last time he remembered trying it. Cautiously he lifted an arm and flexed it. He glanced back at Lois, who was watching

him with amusement. "It feels all right now. Heavy and clumsy, but no pain."

"Good." She stood up and brushed her unruly hair away from her forehead. "I'll fix your breakfast just as soon as I take my bath, all right?" she said. Hal nodded absently. The stream was twenty yards away, and Lois walked quickly over to it. There she pulled her jumper over her head and dove into the crystal water. "Eeii, it's cold!" she shrieked. Her vigorous splashing threw sharp brilliance in the early morning sunlight. After a few minutes, she came out, letting the water dry on her soft, golden skin.

Hal was watching her in openmouthed admiration. It was a most remarkable sensation, this pleasure at seeing her move in that lithe, supple way. He had never before experienced such a thing.

As she came up on the grassy bank, she noticed his rapt gaze, and quickly snatched up her single garment and held it in front of her. "All right," she told him briskly. "You too. You're much too big for me to handle effectively, so you haven't had a decent bath since we got here. And it gets pretty hot during the day."

Obediently, as if in a vic-spell, Hal stood up and walked to the water's edge, keeping his eyes on her.

"Look where you're going," she said sharply, and he shook his head dazedly. He slowly removed his clothing, dropped it on the ground, and jumped into the water.

That was the end of the spell. The water was like ice, he howled like a wounded animal and tried to jump out again. But the gravity made him clumsy and he fell back with a great splash. He rose again, gasping and sputtering, making wild, awkward movements—in a frenzy to get out of the excruciating coldness. Finally he was lying on the grass, panting and exhausted.

Lois was standing over him, her pale blue eyes dancing with delight. "What a spectacle," she bubbled merrily. "You should have seen yourself. I sure wish I had a vic-o-graph with me. Such performances should be preserved."

Unaccountably, Hal found himself gurgling like a delighted baby, and then laughing with her in loud, uncivilized guffaws.

After a few minutes, they were both worn out with hilarity. Lois sighed. She gave him a brimming smile, and went on back to the lean-to. "Get your clothes on," she said. "I'll have some breakfast for you in a few minutes."

IT WAS FOOD, Hal agreed, but it was not very good. It had come out of the standard emergency ration from the Aircab master units, and no power on earth could have made it very palatable. And the supply was nearly gone.

"I don't know how we can get back," she said thoughtfully, as she chewed on a wafer. "Plenty of Aircabs go by—I've seen a dozen or so during the past week. But nobody ever looks out of them except Outlanders, and there aren't

many of us around. So there isn't any point in building a signal fire."

Hal did not reply. He lay back on the grass, his belly full with unaccustomed satisfaction, staring at the blue sky. He decided that he still preferred green. "It's sort of a washed-out color," he murmured.

"What?"

"The sky. It's sort of pallid and weak-looking."

"That's haze. But spoken like a big, strong man," she said lightly. And then wistfully added, "A pity they always take it out of you."

Hal frowned, and looked down from the sky to the windblown dampness of her golden hair. "What do you mean by that?" he inquired.

"Nothing." Her gaze returned modestly to her wafer, and she continued the former subject. "We were talking about getting back to what you call civilization, remember? Or do you prefer we become the new Adam and Eve lost in the wilderness?" she asked, her eyes dancing. "We could start a new primitive dynasty of plains savages."

"Oh." Hal's mind came back to the immediate problem. "Oh, yes, that's right. We have to get back." He frowned a moment. "Well now, let's see. There're a number of emergency stations spotted around the interurban wilderness. Can't just remember where I learned about them—must have been Treatment information." He thoughtfully picked up a stick and began drawing diagrams of maps in the loose soil. "There." He pointed with the stick. "One of them should be about two hundred miles north of where we are now, provided the automatic pilot of my Aircab was accurate in its final position fix."

Lois was looking at the crude map when he glanced back up at her. There seemed to be a sadness in her expression. She nodded her head at the map. "From that it looks like those emasculating treatments do some good after all."

"Don't talk like that," he reproved her. "The Civilization Conditioning Treatment is the basis of our culture."

She started to speak, hesitated, and then blurted out, "What, precisely, does it do for you?"

"Don't you know?" Hal asked astonished, and then answered his own question. "Oh, of course, Outlanders would hardly know much about civilized history. Well, before interplanetary exploration was started, there weren't any areas at all like this wilderness. The planet was much too crowded. The people lived in huge, contiguous cities and were incessantly battling with each other for economic survival, social survival and animal survival. The vast majority of the population couldn't stand it. They developed all kinds of psychogenic illnesses. The impact of the uncontrolled inclinations of individuals meeting the absolute self-control required by civilization was killing them.

"Then, gradually, the Civilization Conditioning process was developed. What happened then was just what you would expect—the people who took the Treatments

were so much better adapted to civilized living conditions that the others simply didn't have a chance. Just as soon as planetary colonies were opened up, the savages were all shipped off. There were a lot of riots and small-scale wars for a while, but eventually the superior conditioning of the civilized people won out.

"After things had stabilized again, anyone who wanted to was permitted to become an Earth citizen, but he had to take the Treatment, and keep it up. But by that time, most savages had a lot of peculiar prejudices against it, so the population of Earth has remained very small. The robotic defenses of the Proprietors protected the planet from further invasion, and now the robotic police maintain order everywhere in the system.

"Of course, the planets are extremely poor in natural resources, so we supply the basic material, even though we relinquished political control long ago. The colonies pay us by sending unusually gifted technicians like your father to work for us. Naturally, Outlanders have no rights, whatsoever, here. Not even the right to life or freedom or payment of the material allotment. But unless they commit a crime or otherwise interfere with the Proprietors, there is not the slightest danger of being molested by any citizen, because citizens are civilized."

Hal stopped his history lecture and looked back up at her. "The Treatment is responsible for the entire rational order of our culture, as you probably know."

"But look how insipid it makes you all," she burst out. "You're so weak and wishy-washy. There isn't a noble or even a strong sentiment in your entire society."

"That is how the process works. It is nothing but a series of checks and balances artificially installed in the subconscious which make strong sentiments unnecessary, and which prevent unstable activity. The result is a perfectly smooth existence with no ups or downs, and a perfect cooperation between civilized people."

Lois thought this over for a moment. Then she asked curiously, "How do you account for the fact that you—after all the Treatments you have taken—are so different from other Proprietors? You, well —" she stumbled, blushing a little "—you seem perfectly normal in your reactions."

Hal shook his head. "I don't know. Maybe my last Treatment had an error in it." But he shook his head again at that idea, because the computor at Central Authority never made mistakes. "It *is* strange."

"I think it's wonderful." She smiled at him with quick radiance.

Hal grinned happily back at her, feeling an alien surge of joy as he looked at the smile and at her. "Well, whatever it is, for the next few months or so it looks like we'll be savages in fact."

THEY WERE. And they took a long time walking north to their destination. It was a remark-

ably satisfying experience for Hal. And it was for Lois, too, as she pointed out to him the night after they found the emergency station. There was a small Formair shelter at the place, and a simple automatic distress transmitter which was set in operation by one push of a button. Symbols marked on the case of the transmitter assured them that assistance would be forthcoming within twelve hours.

It was their first night in a civilized shelter, and their last night together in the wilderness. Early the next morning, an Authority Aircab came humming swiftly down to the meadow where they were waiting.

Once inside the Aircab, Hal became taciturn and thoughtful, but Lois was not disturbed. She talked enough for both of them. Hal luxuriated in the pleasant reawakened rapport with the things of civilization.

Back at the city, they went to Bruchner's residence, and Lois' father rushed outside to greet them. Lois ran happily to him, embracing him, and volubly explaining how wonderful Hal was, how he had saved her from being gobbled up by a lot of wild animals, and how strong he was, and sundry other affectionately innocuous exaggerations. Hal looked curiously on for a few minutes in idle wonder at the strange attachments of Outlanders. Then Lois proudly pulled him over next to her.

"Isn't he wonderful? And we're in love—oh, so much in love."

"Lois," Bruchner mumbled unhappily. "There are some things you have to be told. I should have told you before—"

"You don't have to tell me anything," she bubbled happily. "You can say all you want to about the Proprietors, but this one is different. He's—he's real!"

Hal laughed diffidently, and moved a little further away from her. He gazed around at the city, recognizing it with thirsty familiarity, happily part of it again. The experience of the past three months already seemed far away.

"Hal," Lois murmured, suddenly aware of his rapidly growing coolness. "Hal, darling, what's wrong?"

"Why nothing at all, uh, Lois." He looked at her uncomfortably for a moment, and backed a step further. "It's just—well, you know."

"Oh no you don't," she cried, rushing up to him and grabbing his arm. "Where are you going—Dad!"

"Please, Miss Bruchner," Hal murmured mildly, disengaging his arm from her. He gazed hungrily around him again the moment she let go, and looked back at her only when he was startled by a sudden, choking sob. Lois was staring at him, her fist to her mouth, the pale blue eyes brimming.

"Oh no!" she cried tremulously.

"Lois," Bruchner said, his voice sounding harsh with repressed emotions, "come in here. You've got to know what the situation is." He put his arm around her trembling shoulders and led her off, glaring at Hal in helpless fury.

The moment they were out of sight, Hal turned and stepped back

into the Aircab. He ordered it to take him home. His parents were there, watching a vic-entertainment, which Hal promptly turned off.

"Who did that?" his father mumbled, coming immediately out of the trance. "Hal? That wasn't a very nice thing to do, son."

"Why Hal," his mother sighed mildly. "You're not dead after all. How nice. Don't pay any attention to your father—it wasn't a very interesting vic anyway."

"Shouldn't turn it off like that, though."

"Um, sorry," Hal apologized gently. He relaxed into the comfortable, perfect fit of a Formair lounge. "Just thought I'd let you know I'm still alive."

"Well, we're glad," his mother murmured absently. "Must have been pretty awful."

"That's the funny thing about it, though—I didn't mind it a bit at the time. Very curious. I had an Outlander woman with me—Bruchner's daughter, as a matter of fact."

"Oh dear," Mrs. Webber sighed. "Poor Hal."

"Well, like I say, it wasn't exactly mild, but it was quite tolerable, somehow." He frowned just slightly, and shook his head at the puzzling incongruity. He recalled his three months of association with the uncivilized woman, somewhat wistfully contemplating strong, overpowering sentiments in a chaotic wilderness. "Anyway," he said at last, "I'm home again, and it's all over. I won't have to have anything to do with her now."

"Yes," Mrs. Webber murmured. "Odd that you should have survived though, isn't it? I thought a civilized man in the wilderness would die almost at once."

Webber gave the cultured equivalent of a mild snort. "Of course he could survive. Oh—" and he laughed softly in apology "—that's right. I forgot to tell you about that."

The eyes of his wife politely turned to him and he explained. "A couple of weeks after our son here apparently had been killed, I happened to run into an Authority physician. I mentioned it to him, just in passing. He told me that there was a factor in the CC Treatment that provided for such things.

"It seems that the Civilization Conditioning they give you is only designed to enable a man to survive in a city. In order for the conditioning to function, you have to have that civilized urban environment. Once the environment is removed, the conditioned complex has nothing to react against, and the man immediately becomes almost—but not quite—as savage as a typical Outlander.

"That way, a civilized man can always manage to live in the wilderness, given half a chance. Once he gets back into a city again, the proper, civilized environment is returned, the conditioning starts functioning immediately and presto!—the man is civilized again."

"Well now, that's nice," Mrs. Webber said placidly. "Wouldn't like to see my boy dead."

(Continued on page 103)

Such magnificent gifts as these were undoubtedly intended for Mankind. But those who possess them are rare indeed, while those who fear the unknown are legion

they were different

BY NEIL J. KENNEY

As secretary, receptionist and general nursemaid to them I took it upon myself to dig back through the news files and get enough clips to tell their history from birth until they opened the school. You've all read it so there's no need to go into details about their strange life and still stranger birth. Nor their magnificent education or still more magnificent gifts. It's true, every bit of it; their telepathic and ESPing powers WORKED. They were the only births like them to survive to maturity and beyond.

During the last contact I had with them (I was their first and most advanced pupil) it came as pure inspiration to take down their transmissions in the special short, shorthand we developed for use among the pupils and ourselves. What follows may be added to the story told by the news clips, differing only in person. I have added nothing in translation of the notes,

Illustrated by Paul Orban

leaving the narrative as disjointed as they gave it. The events are as they transmitted them, as they lived them. I was in contact with them until—but read, and when you're through reading do as I do every night.

Pray.

And hope—for mankind.

WELL, Kitten, it seems impossible that three grand, successful years of work could end so suddenly with us lying in a ditch or anticipating, ESPwise, an occasional bullet fired from the guns of friends but there it is. God, what a complicated being this so-called modern man is! He seems to be born cloaked with complexities which get even more complex as he grows. No wonder he has been so long on the road, being engaged in a continual battle between ethics and emotions as he has.

So here we are, the bridge, the first rungs of a ladder leading to a new and delightful plane of existence for all mankind, wallowing in the mud of an irrigation ditch instead of glorying in the divine world of the mind. If we can but make them see! Maybe the professors were right when they told us to teach under the protection of the university instead of hardheadedly going out on our own.

Princess, do you remember Lucille? She was our best pupil, after you, of course. She's the one who turned over the stone that freed our personal gremlin. Oh, it's not really her fault, though she did break our one and only cardinal rule by bringing in an outsider herself instead of leaving such choices to us. Actually the fault was ours because—well, who knows? That wonderful control we practiced for so many years slipped, no matter the reason. It was just one of those inexplicably foolish things people will do when they think they're in love. Guess we thought we could save her some embarrassment or some such thing.

You had just left on a long vacation when *that* one showed up. He was the man that Lucille brought up with her as a prospective pupil, the one that—one wing of them is closing in on us now, Kitten. We'll have to try for the swamp ahead of us. We'll have to lose them for a while if we want time to figure a way out, though we aren't really very good at this sort of cat and mouse game. We can give our own boys a little credit, though. They aren't really trying to hit us. They shoot well enough to be able to make it look very good. All we really have to worry about is Thurlow and his trained deputy, Trainor.

There, that was nice. The sheriff himself just spotted us and started a pincer movement—fifty yards in back of us. Good old boy. Hope he doesn't get in trouble over us.

At last! If this patch of swampy brush is really as thick as we ESP it we're made, providing the highway troopers of this state don't get too smart and take over the operation. Our sheriff is in charge so far. Lord, if we only weren't so tired!

Anyhow, Lucy brought Thurlow

in and we gave him the usual treatment. The only trouble is we overdid it slightly and it scared him. Besides telling him what he had for breakfast we ESPed his wallet and told him its contents and when he reached for it in a sort of stunned reflex action we levitated it into his hand. It was a pretty big mistake in view of the fact that he was one of that bunch that was fairly sensitive mentally, but whom we couldn't read thoroughly. We could telepath only the very surface of his mind. He would have made a wonderful adept with the proper training.

He was awed but shocked and scared, too. It was outside his realm of experience and he was superstitious in spite of his fine education. Some folks don't let learning sink in to open the rusty locks of prejudice and inhibition.

He said things that bared his mind as surely as if we had read him. It wasn't a pretty mind, either. It made us sick physically and the impulses that did come through were deep and angry, giving us a terrific headache and making it hard to concentrate. Later we followed him but still couldn't read him for the anger flashes blotted out his thought stream thoroughly.

To him, what we were doing just couldn't happen in good old 1983. We were dealing in the black arts and he told us as much, refusing to listen to reason in any shape. The fact that everyone has these capabilities latent was altogether lost on him. Our licenses, diplomas and degrees meant less than nothing and the longer he went on the more rabid he got, frothing obscenely about such things as tampering with forces better left alone and man thinking with his brains instead of letting the Prince of Darkness do it for him. Had it not been so serious it would have been almost slapstick. Instead he was tragic.

When he got to the part about us eventually filling the minds of children with our loathsome disease he ran out of expletives and stormed out of the office in a cloud of anger and fright, muttering that we hadn't heard the last of *him*.

Lucy, of course, was heartsick. We didn't have to tell her what the meeting had meant. Nor did we tell her what else we'd ESPed in Thurlow's wallet. She found that out during the rather abortive lesson we tried to give her for she read as we interrupted it (that shows how much off beam we were because we just don't do that) to take a phone call from Casey down at the sheriff's office. Our visitor, Thurlow, was District Judge Thurlow of District Two, a very high man on the law enforcement pole.

Casey was good. He'd listened in while Thurlow was complaining to the sheriff and apparently heard the sheriff read the judge off politely but nonetheless firmly, telling him first how valuable we were to the force when it came to interrogating hard-to-crack suspects and as long as we hadn't committed murder or rape or passed any bum checks there was nothing to be done. Especially since the judge His Honor was out of his dis-

trict! Fortunately we were in District One over which our mutual friend, Judge Kimball, presides.

Incidentally, Kimball was still under doctor's care at the time due to his latest heart attack. He was getting along quite well but he was old and his days on the bench were pretty well numbered. Casey thought that District One might conceivably have to appoint a new judge to hold them over until election due to the fall court calendar. As it turned out that didn't happen.

Br-r-r! Princess, don't ever let anyone tell you that swamp water can't get cold in summertime. We've got the shakes pretty bad both from our ordeal and from chill. Getting uncomfortably hungry, too. That's what comes of letting an inferior enemy panic you. We certainly haven't acted as though we had better sense. It's just another of those imponderables to chalk up for study.

After Casey's call the air seemed to be cleared and under that driving compulsion which has never left us we went on about the business of trying to succeed with nature since she had succeeded so well with us. The study of the deep processes of the mind eclipsed the next two days and only the terrible jangle of that outmoded telephone brought us to the surface again. It's too bad that we had to converse orally with the great masses of the untrained. It's so slow and they could learn so easily.

It was Casey again, telling us we were needed down at the station. He was apparently calling us on blind orders, for he couldn't tell us what was up. Figuring that we had another prisoner to crack we closed classes and drove down. The sheriff seemed mystified, too, and just slightly troubled. We could read that much off the surface of his mind, but he was upset enough to make the rest of his thoughts a meaningless jumble of impulses. All he knew was that we were wanted in the judge's chambers.

You guessed it, Honey. It was Judge Thurlow filling in for Kimball on an emergency hearing and he figured it was his duty to mankind to give us a little talking to while he was there. After all, the good of the community was his concern now, and he chose to interpret that as the opportunity to place his narrow little views on record. Trainor, the sheriff's deputy faithful only to the judge, because of a favor granted while he served in Thurlow's district, was very busy signing his name to something when we walked into the chambers. It gave us a peculiar feeling to see Thurlow sitting at Kimball's desk. It bore out our theory about a room taking on the personality of its occupant. This room was no longer warm and friendly.

The only thing we could read from Thurlow was a self-righteous anger and a solemn, nasty vow to fight us to the last ditch—which, incidentally, he has done for that irrigation ditch is the last one we ever wish to occupy. That water was miserably cold.

Three guesses what Trainor was signing. Of all things, a complaint charging us with questionable edu-

cational technique! The one thing not covered by license, as Thurlow made haste to confirm through the State House, and by Trainor's complaint, the one way we could legally come into his hands. It was a dainty little frame but unbreakable. Spreading a sweet legal shovel he asked us questions that minutely covered every phase and method of our teaching, then smiled a nasty smile, the while fixing his own signature to another wisp of terribly binding paper. A restraining order.

The words of which forbade us to teach! We were to suspend our life's work or suffer the punishment for contempt of court because of a narrow-minded, righteously wrathful mental prude!

How can you fight something like that? Thurlow was the last and highest branch of authority in the area unless we took it to Supreme Court. For a while we were tempted to do that but on what were we to base a case? Public opinion would throw us out of court if the Supreme Justice didn't.

We talked to the sheriff when we came down and he and his boys were on our side—emotionally. Legally they had to carry out the judge's orders to place us under institutional restraint if we transgressed. In short, we would be tossed in the pokey if we thumbed our noses at the order.

The sheriff's advice was to suspend operations until Supreme Court sat and take it to them. When we asked if he and his staff would be witnesses for us—well, that's water under the oft mentioned bridge. There are some ugly facets of politics that force the men playing them to act as they do. Otherwise we surely wouldn't have been refused. So there we were; no witnesses—no case; because we couldn't bring our pupils into it. It was an uncertain mess at best and we didn't want them to get it in the neck along with us. For the same reason we couldn't involve our former teachers at the university. What poor payment for hours of drudgery to be dragged into a court battle!

So with the sheriff's advice to go into another business ringing in our ears, we came back home to sweat it out and think. It took a while, but the only answer we felt was right under the circumstances was to go underground. That makes it sound like the dark ages, doesn't it, Princess, when knowledge has to hide and creep and skulk instead of flowering under the sun? Our gifts couldn't be let go to waste, not after the preparation and development that went into expanding them into a workable set of psychic senses. We *had* to give Man the benefit of our awakening by waking him in turn.

It's much too bad that we were so sheltered at the university. We might have had some practical experience with the world and its people. We might also have known what to do about this awful hunger that is gradually tearing us down. It's getting to be a serious problem in our untrained condition. The prof's wouldn't even let us play handball for fear of injury so consequently we're nothing but a living cliché, skin and bones. Donald

feels it strongly. We shall have to try to buoy each other and go on our combined reserves. Pray that we don't get too weak. It's been almost 24 hours since we've eaten, as there wasn't time for breakfast. Our clothes seem to be drying slightly though it's still cool enough to make it uncomfortable and dangerous. This is the way colds grab you.

We did pretty well in our choice of an underground location—we thought. Our mistake was in overlooking the police trained mind of our bloodhound friend, Trainor. He's a shrewd man and not unintelligent though sadly misguided. How we should like to have him on our side!

In five days of sniffing around he had us located, and in another, he had enough proof of activity to report to Thurlow and come after us with a bench warrant of arrest. It's peculiar that we couldn't stall him or dodge him some way with our much touted IQ, but probably we were still too naive about human relations and most assuredly unversed in the devious twistings of the police mind. After all, though we're twenty-six years old, our experience with people put us in about the three year old class. So you see? Were it to begin all over again the outcome would be different. We would be more practical and worldly. You learn.

There was no sense fighting him, because he had the law enforcement agencies of the whole state in back of him. All he had to do was whisper "Sic 'em" and we were dead. So we went along quietly to see Thurlow and that dear man took a singularly fiendish delight in imposing an impossible fine on us for contempt of court. Our particular transgression wasn't definitively covered by law so neither was the fine. The fact that Thurlow was fining us for teaching methods instead of the contempt charge didn't dawn on us until just yesterday. How completely ignorant can you get?

He gave us a pretty, self-righteous speech about the good of the community and a judge's place in it, mentioning in passing that everything wasn't covered by law so it was up to the judge to handle matters as he saw fit. That was what he was trained and elected for and that was what he was doing. Nothing personal, understand. As it was, and well he knew it, we couldn't begin to pay the fine so we were informed that we'd have to sit it out in the county jail at the rate of two dollars a day.

The fine was five hundred dollars.

The sheriff almost cried when he found we were to be taking advantage of his hospitality. Very likely the full injustice of the judge's complacent little scheme finally got through to him. At any rate, sympathy or not, we had eight months and ten days to serve with time off possible for good behavior. That's where you found us when you finished your vacation and discovered you were temporarily out of a job.

Donald took quick advantage of a prisoner's rights to telephone Judge Kimball. He was still in bed but sounded fairly strong. His con-

sternation over our new address was touching and real, but we were sadly informed that ethically the whole matter was beyond him. When Thurlow sat in for him in his district, then Thurlow was law and no reversal could be had outside of the due process of that law through a higher court. He, Kimball, could do nothing until he could get back on the bench. That might be several weeks yet as he wasn't to get out of bed or get excited in any way.

We hung up and had our first look at the familiar cells from the prisoner's viewpoint. The change in outlook was subtle but definite. The walls looked grayer.

Hope we're not boring you with all this, Kitten, but we must tell it to someone and you are closest and dearest to us. You missed out on nearly all our doings after we closed the school so call it a filling-in process. Someone should have the full story although what good it will ever do is debatable. Perhaps at some future time we can do something with it—if we get out of the present jackpot.

Got to move. The state police have taken over the operation and our sheriff is relegated to the role of visiting fireman. It's lamentable that we aren't in his bailiwick. Things might work out better.

These troopers are very efficient. Donald ESPs them folding a cordon around our end of the swamp. All we can do is head through its length now. Trainor is with them. Thurlow has joined them also. We get a tiny jab of pain as we pass over him. That impossible man!

Naturally our pupils fell off, thinking the school completely shut down, until you visited us and were able to pass the word that discreet visits wouldn't go unrewarded. Only a few drifted back for deeper learning and expansion, as you know. One happy thing about the others who were afraid to come back is that they would still make progress, having once been awakened, though it would be infinitely slow and groping. The nucleus that sat with us on those once a week school days grew stronger very rapidly, for knowledge is cumulative and progressive, and they began to realize what they in turn had to do when they were ready. Credit must be given their strength of mind for seeing and accepting such a responsibility with the enthusiasm they showed.

It was too good to last. Trainor's turn at afternoon shift came around and lasted the usual month which gave him plenty of opportunity to watch us like a hawk. He did. We were cautious but we couldn't know what he was watching for, because he didn't know either. He found out one afternoon. Visitors just don't come around and merely sit—staring at each other or the walls.

We learned another lesson from that: men with as much training as he had don't always consciously think things out with their surface minds. Their reactions became instinctive and as such, untraceable by the most adept telepath. We knew he was there to spy but that's about all.

The net result was a direct order from Thurlow cutting off not only

all visitors, but as Trainor gleefully advised us, cancelling all accrued days off for good behavior. That's five days a month in this state and it was almost unbearable. The thorough injustice of the whole affair was beginning to gall mightily, getting under our rather thin skin in many places.

What seemed the final crushing blow was the news that filtered in to us from Judge Kimball's court reporter. He'd taken word to the sick man about our latest loving treatment by Thurlow and it angered Kimball enough to make him get out of bed—too soon. He died on the floor of his bedroom. So, not only do we lose a dear friend, but also any chance of his assistance. Thurlow would now sit for District One until election time. That put us entirely on our own resources.

After much deliberation, we decided to give in and go back to the university when our sentence was up and take advantage of its sheltering walls for our teaching. We would be absorbed into the faculty and soon all this unpleasantness would pass over.

How we passed the time until our release is unimportant to anyone but us. During the remaining months, we delved farther and farther into the mind and gained a much deeper insight into the workings of these gifts we had. Man could be so powerful and work so much for his own good—if he could only be made to realize the potential in his mind! He could even be happy.

The bright day came at last, and we walked out of our cell free to begin again. It was raining a gray rain outside, but to us the weather had never looked brighter. As we reached for the sheriff's phone to call the university, Trainor sidled up and laid a scrap of paper on the desk. A glance was enough to make us hang up on the uncompleted call.

It was another restraining order.

After that we tried to find work on the outside, but it was a sorry failure. The curse of being different is a mighty one indeed. No one seemed to care that we had feelings the same as others and that we could get just as hungry and thirsty without funds to buy.

Ahh! There it is again. Those words. Hunger and thirst. As if we needed a reminder. Donald is getting weaker in perception. He has always been the first to feel such things and we've never been able to trace the reason. We certainly have no—

I interject at this point, for telepathic contact with them broke unexplainably. I prayed for their safety for I suddenly knew what it would mean to lose them. What a drab, dreary, bigoted world it would be without them to teach us and help us.

God, that was a bad half hour, Puss. These troopers are so well trained that they're more telepathically dead than you can imagine. First, Donald was so weak he let one of them sneak up close enough for a quick rifle shot. It missed, but of course it told exactly

where we were. Donald exerted himself and ESPed locations, finding that we had enough time to work on the trooper if we hurried. Normally we'd be no match for him but desperation can work wonders. We resorted to a base form of trickery by affecting to surrender to him. When he came up to put the cuffs on us, we played dirtier by offering him a knee that will keep him from attending his wife for a few days. Rotten trick, but we couldn't afford to let him get his hands on us or it would have been all finished. That makes another count against us. We left his rifle out of reach and ran.

Fortunately the others milled around for a precious minute or two when they found him, giving us still more time. Before they got moving again, we broke cover and made it across a county road into a farmer's barn where we burrowed into the hay. We'll stay here a while to rest. Not being the athletic type we sure need it.

To go back, our small supply of money was running dangerously low in spite of miserly budgeting. We didn't know what to do outside of robbing a bank to get more. Then it happened.

We were browsing through the library one day, when Donald ESPed a stack of returned books not yet filed hoping to turn up something new. The stack was mixed, holding such things as a treatise on grinding optical lenses, a copy of "Gone With the Wind", a couple of western novels, a thin edition of "The Purloined Letter" and several volumes for the home craftsman. Evidently some newlyweds were doing things to their well mortgaged dream house.

On the way home, Donald's idea burst in on both of us like some monstrous flashbulb. With our minds being so perfectly tuned through constant work during the years, what one ESPed the telepath had immediately and what one telepathed the ESPer received at once. It was a fine working agreement and became as habitual as breathing. Donald's idea was beautiful for all that it was lifted from another man. Its application was what burnished it to that bright luster of originality.

We would go to work in a carnival! If a man could hide a letter in an open letter rack, where better could we be hidden but in a carnival? It was wonderful.

We had no trouble getting into one. The owner took one look at what we could do and told us the answer mentally by wondering how little he could offer and still get us. It gave us a certain bargaining point but at our stage of the game all we wanted was in. The thought crossed our minds that we might be lowering our station in life but we were past caring.

And of course we found out how wrong we were, that "station in life" is just a point of view. To outsiders carnies are a hard lot, interested in nothing but the quickest way to part the suckers from a dollar. Well, they *were* hard, to outsiders, but to those inside there is a difference. We found some mighty fine people and some very fertile minds.

We enjoyed the first real security we'd known for a long time. We found friendship and a certain amount of fame as moneymakers for the show. We got a raise after working on the boss for a while. Best of all we lost ourselves in the bustle of the show.

Shortly after our admission into the ranks of the carnies, we felt safe enough to put out feelers (we were out of the state by then), mental this time, prodding small ideas into the best minds, giving them the urge to ask us questions of a leading nature and so eventually we began another class in telepathy, Esp, and their related subjects. As we traveled from state to state we picked up new pupils from other shows and lost others to the same shows, but the running count was about twenty most of the time.

We had to be so very careful in our selections for fear of a repetition of our former mishaps, but it went well. We made no mistakes and turned out some fine pupils, one in particular. He progressed fast enough in the short time we had him to become acutely adept, and when we told him he was ready to teach he accepted it by leaving the carnival to settle down with a home and wife. It was good to see the fruit of our work being put into practice.

Next season, we found that in the first pass across the country we were booked for the north end of our home state. For the first time in nearly two years we would be on almost familiar ground.

You know what happened then, Baby. You ought to. You were the one we contacted. Telepathy *is* a lot better than a telephone, isn't it?

What you might not know is that our contact with you was another step in this whole sickening drama. How were we to suspect that the train ticket agent was one of those tenacious, bespectacled fellows who doggedly chewed on an idea until it made sense to him? Who would know that he was one of those spiteful, small people who enjoyed doing his civic duty as he saw it?

He wondered why so many people were taking the same train on the same day to the same place, when it had never happened before. People just don't travel three hundred miles to take in a one horse carnival.

Being a small town he knew most of the folks by name—or at least by sight—and he recalled that you, sweet, were once our secretary.

Imagine the excitement he felt at having such a momentous thing happen in his dull and uneventful life. How best to savour the taste of it? Why, call the sheriff, naturally. Oh, it must have been delicious. Let's hope he enjoys the memory.

With our luck it was out of the question to have anyone but Trainor answer the phone—and swing into high gear. Apparently Judge Thurlow had run for District One during the election and made it, giving up his own stamping grounds for some reason. It hardly seems possible that he'd do it just on the hope that we might decide to come home and set up shop. No man could be that vindictive, could he? Or are we still much too naive to

be allowed out without a keeper? Who knows?

We do know that the group was followed by Trainor and another man at Thurlow's orders; and when they saw all of you meet at a certain tent in back of the midway all they had to do was sneak close enough to hear that there was exactly nothing going on! We were all so excited at seeing each other that their presence went unnoticed. Besides, what need to exercise caution when there wasn't an unfriendly face within miles?

When Trainor made his telephone call to get the permission to arrest us on the strength of another bench warrant Thurlow prepared in a hurry, his emotions penetrated our little circle; but not soon enough for everyone to get out safely. It all happened so suddenly that our lifelong control snapped. The persecution was so sneaking and so needless!

It didn't take long to dispose of the two deputies. Desperation again and thick anger. We lost no time in trussing them solidly and leaving them unconscious. After it was over, we realized what a deadly game it had suddenly become. We were in deep trouble again—deeper than any that had gone before. And we needed time, lots of it.

Take our word for it, Kitten, and stay underground during any time you and the others may teach. It's your duty to use care, because you certainly won't be able to advance your state of learning or help others while under detention. Keep in touch with the others. Your ranks will fill, if you can succeed undetected until it's time to come into the open.

Don't get into our fix; don't be forced into breaking the law. We didn't break it by teaching supposedly Satanic courses but by ignoring the restraining order, then by beating up the police and running. Running wasn't too bad in itself, but it made it tougher when in our shocked haste we took a car that didn't belong to us. Then, too, we shouldn't have taken it across the state line. That made it a federal offense. Even if the troopers get us, we shall first be guests of the FBI. Sweet mess, isn't it?

Lordy, this hay is dry. It's sweet smelling and comfortable lying here but it's dry and dusty. It'll be too bad if nature gives us away through a tickling nose. We can do without her tricks now.

Donald has just ESPed a water trough in back of the barn. We must take a chance on it. This raging thirst is as crippling as the lack of food.

We drove in a huge circle and left the car well before morning; continuing on foot in the general direction of our friend who had left the carnival to teach. It was our hope to be able to stay there until things cooled down.

We finally made it, tired and hungry, and got the welcome we expected. He was overjoyed to see us. You'll never know how cosy and warm that house felt or how utterly *good* was the smell of baking bread. His wife is a jewel.

We received a jolt the next morning before breakfast. The neighbor's little girl came bursting

into the house in what apparently was her normal fashion while we were teaching a small class that our friend had collected. She was extraordinarily sensitive and our combined minds made a terrific impact on her perception before we could control it.

Her eyes opened and she was all for broadcasting to every child in the block, but Donald got us through a sticky moment. He made it her own personal secret in a way that only children can appreciate and then showed her one of the simpler tricks of ESP. She grasped it at once for children are extraordinarily susceptible to instruction. Their minds haven't had the chance to get cluttered by inhibitions and conventional thoughts. She was wide-eyedly delighted and promised her cross-my-heart promise that no one would ever know about us.

But of course, they did. Parents being what they are, it was foolish to assume that an untrained child could keep the signs of her adventure from them. The signs pointed to a story and it didn't take them long to pry it out of her. It wasn't the girl's fault. The adult odds were against her.

They poked and prodded at her for the cause of her overly bright eyes and animated spirit, until the poor child was overwrought and blurted out the details of her immense find. The mother was at once sympathetic to her and us, bless her, but not so the father. They both knew she wasn't imagining it because of the stories they'd heard of us over the years and the father blew up. We could sense the whole tableau telepathically, dreading the outcome, knowing what it must be.

The father stormed about the house crying death and destruction on us, while the mother tried to get him to listen to reason. He was mentally incapable of doing it. He, like so many of the others, was terribly frightened at the unknown, fearsome thing in their midst. It was unthinkable that we should stay free of captivity when there were places for people like us! We shouldn't be allowed to mingle with normal, decent folks. The upshot was a long distance, collect phone call to the judge who doubtless accepted the charges quite happily.

We couldn't stay, so we turned to run once more.

That's about all there is, Princess. We've run until we can hardly run any more. We're weak and hungry and sickened by the hatred and stupid, active resistance surrounding us. We don't blame the police. They're merely doing what they are paid to do.

Donald has ESPed them filtering through the swamp in a wide semicircle and a few thoughts are leaking through the jumble of shouted orders and mixed impulses. Trainor and the judge are right with them. He seems to be talking earnestly to Trainor but his hatred and anger blot everything out—we can get nothing from him. Donald is getting weaker, but we must stir to get water and try to leave before they see this barn.

Here the narrative broke once

more for more than an hour, leaving me in an agonized, hopeless suspense, knowing there was no way to help them. Occasionally I sensed a faint stirring in my mind as though they were trying to get through to me and once a deep stab of sorrow amounting almost to pain. It was getting quite late in the evening before they came through once more, weakly but still clearly and coherently.

It's hard to concentrate. The ambulance is jerking and bounding along and the pain is frightful. Looking back, there was no other way for it to end. They were too many and too dedicated, while we were only us and on the run, not even on the defensive.

Our physical weakness became painfully apparent when we cautiously ventured out back to find the water trough, drank, and stumbled away from our pursuers for a quarter of a mile right into the hands of six waiting state policemen. We'd been so intent on the men in the swamp, so blanketed by Thurlow's hate, and so tired that we didn't sense the danger from another direction in the form of a flanking movement. The operation was the end for us. They all had drawn weapons, but when they saw our sad state they rather sheepishly put them away and took us almost gently in hand.

We're getting weaker. Unconsciousness is near again. Would that we could have stayed with them!

Instead, one picked up a walkie-talkie and called in our capture. Even in the turmoil of the moment we could pick up flashes of amazed, frightened and curious thoughts as many of them saw us for the first time. Funny how the mind will act at times of stress, making one an observer of one's own actions, so to speak. Another phase opened for study!

Thurlow thanked the state men brusquely and said he and his deputies would take over, airily ignoring extradition procedure. The police chief and our sheriff were dubious about the course events were taking, but didn't want trouble so they offered no active resistance.

We were too tired to care any more. That was our third mistake, to lose our alertness completely. Had we been quick enough—but no, we couldn't have avoided it. The old story of trained men reacting without conscious thought.

Apparently in accordance with previous instruction, Trainor and his helper began jostling us viciously but expertly, making it appear as though we were trying to escape. Before we realized our danger, we heard a cry of warning from the sheriff and a vindictive shout from Thurlow. It still rings in our ears.

"Do your duty, Trainor. They're escaping!"

Trainor's reflexes jarred him into action and it was over for us almost before it began. It hurt then, but the pain is worse now and total blackness is closing in once more. Fighting it off gets increasingly difficult, alone as I am.

You see, Donald has just died, quietly. He's escaped them, but that leaves the fight to me. It won't

last long. The load is too much for one alone. The one bright feature is the fact that our work was begun. Stay with it, darling, and carry on for us—please know that you had all our love.

Goodbye, Princess.

Almost exactly one minute later they arrived at the hospital. I was so numb with grief and sorrow that I didn't withdraw contact, hoping against hope that they, he, would transmit once more. He did, unconsciously. Seconds later the words of two interns drifted through his open mind to mine.

"One D. O. A., one dying fast. My God, Rex, why couldn't they leave the poor devils alone? Why couldn't they—"

Rex sounded bitter. "You know the answer to that, Tom. They were different so they didn't belong." • • •

WORTH CITING

Since man's timepieces are pretty inaccurate and absolute measurement is impossible, a search for the ideal time standard with a fundamental relation to the nature of the universe has been going on. Recently the National Bureau of Standards developed such a clock, based on the internal vibrations of atoms within molecules. These vibrations, unlike those of a pendulum or crystals, are uninfluenced by external conditions and are independent of the Earth's rotation.

The atomic clock is based on the vibrations of ammonia molecules. When radio waves are transmitted through a tube of ammonia gas, the inversion of the molecules occurs more frequently if the radio waves have the exact microwave frequency at which the apex atom is vibrating. The energy of the radio waves is measured after they have passed through the tube; if maximum energy is absorbed the system is precisely in tune. Such a clock runs with a constancy of one part in 50 million. Improvements have one part in 100 million as a goal.

With such an atomic clock, it should be possible to study scientific and practical problems of great importance, from the improvement of navigation to a check on the relativity theory. Atomic time will no doubt become the international scientific standard.

Our citation this month goes to the National Bureau of Standards for its work in creating a universal time standard which would hold good even if we should colonize Mars or Venus.

THE PACIFISTS

BY CHARLES E. FRITCH

Parker was a trouble maker wherever they landed. But here was the planet ideal, a chance he had awaited a long, long time —easy, like taking candy from a baby . . .

LIKE A lone sentinel, the house stood apart at the edge of the village, a white cube with no windows. The door stood open, a dark hole against the white brick. The house was silent. The village beyond was silent.

"They must have seen us land," Compton said, a little wildly. "You can't set down a rocket ship a hundred yards from somebody and not have them notice. They must have seen us!"

"Unless no one lives here," Parker amended. "This may be a ghost city."

"He's right," Hinckley agreed. "There might not be anyone living here, or anyplace on the planet for that matter. We've found very little life in these alien star-systems, and it's varied from primitive to ancient. Perhaps this society became old and died before any of us were born."

The three Earthmen stood at the base of the spaceship, their spacesuit headpieces thrown back so they could breathe in the cool thin air. They stood there peering into the deathly stillness.

"I hope there are people living

here," Parker said. "It's been more than a month now—"

"Well," Hinckley said, "let's find out." He waved them forward.

They were fifty feet from the house when a woman appeared in the doorway with a silver vase. She was dressed in a grey flowing robe that covered her from neck to ankles.

"A young woman," Hinckley breathed, staring. "A woman just like any on Earth!"

His voice was loud in the silence, but the woman took no notice. She stooped and began filling the vase with sand. The two men with Hinckley shifted anxiously, settling the sand beneath their boots. Behind them the great spaceship pointed its nose at the sky.

Parker was staring intently at the girl. "I'm going to like this place," he said slowly.

They walked forward, crunching sand. But the girl took no notice of their approach. She was kneeling beside the house, scooping tiny handfuls of sand into the silver vase. When they were within five feet of her, Hinckley cleared his throat. She did not look up. He coughed.

"Maybe she's deaf," Parker suggested vaguely. His eyes wandered appraisingly over her youthful body; he licked dry lips.

Hinckley moved forward and stood before the girl. Her small white hands dug into the sand, scooping around his boots as though not aware of them.

"And blind, too?" Compton wanted to know. "And without the sense of touch?" There was a strange quality to his voice, as though some primitive part of his unconsciousness was telling him to run.

Hinckley bent to tap the girl lightly upon the shoulder. "Pardon me, Miss. We're visitors from Earth," he told her.

But she paid no attention to the sound of his voice, and he stepped back, puzzled.

"Now what?" Compton wanted to know. He looked around him nervously, at the house, the speckled sand, the rocket squatting behind them. "I hope all the natives aren't like this."

"I do," Parker said, licking his lips thoughtfully and keeping his gaze on the girl. "I'd just as soon have them all like this. It might be interesting."

Compton flushed. "What I meant—"

"He knows what you meant," Hinckley said harshly. "And there won't be any of that going on here. You caused enough trouble on the other planets, and it's not going to happen again, not while I'm in charge of this expedition. We didn't come all the way out here just so you could satisfy your romantic inclinations."

"And how about my off hours, *Captain*," Parker said, emphasizing the word as though it were obscene; "then may I fraternize?"

"You have no off hours," Hinckley said sternly.

"Here comes another one," Compton warned in a whisper.

A man, dressed in robes similar to the woman's, came from the door of the house and walked into

the yard. After helping the woman to rise, he picked up the vase, and the two of them went back inside the house. He hadn't even looked at the Earthmen.

After awhile, Parker said, "Do you suppose they're both mirages?"

"Maybe that's it," Compton said. "Maybe it's all a mirage, the woman, the vase, the man, the house, maybe even the planet itself." His voice had risen in his excitement.

"Take it easy," Hinckley advised.

"Let's get back to the ship before the whole planet evaporates," Compton said.

"Go back if you like," Hinckley said. "I'm going to investigate this. How about you, Parker?"

"Okay with me. Always wanted to see what makes a mirage tick." He glanced contemptuously at Compton.

"Okay," Compton said, gripping his rifle, "we'll all make fools of ourselves."

"C'mon, then."

Hinckley led the way into the house, hesitating only briefly at the doorway. Inside, a blue light flickered as the man bent over a flaming trough and poured sand into it from the silver vase. The flames leaped high, filling the room with a sweet fragrance. The man emptied the vase, rose and took it to one corner of the room. He sat down on the couch by the woman. He did not look at the Earthlings.

"He doesn't see us either," Compton said hoarsely. He cried, "Hey, you! You! Listen! We're Earthmen. Visitors from space."

His voice was explosive in the silence. The man didn't look up. The Earthmen became aware of music seeping from the walls, music strange and hauntingly beautiful, played on incredible invisible instruments.

"I don't like this," Compton said. "I don't like it at all. Why are they ignoring us? Why?"

"Maybe they can't help it," Hinckley suggested. "Perhaps they actually can't see us or hear us. It's fantastic, but it's possible."

"I wonder," Parker mused. And before anyone could stop him, he struck the man across the face with a doubled fist.

"Parker!" Hinckley cried. "You fool!"

"That's a matter of opinion," Parker said steadily, rubbing his knuckles. "I found out what I wanted to."

The man had fallen beneath the blow, but recovered seconds later. There was a large red welt on his forehead, but neither he nor the woman took any notice of it.

"It's incredible," Compton said.

"Evidently we can affect them physically, even if not mentally," Hinckley said. "You do something like that again, Parker, and I'll shoot you. I've got the authority to do it, you know, and sometimes the urge."

"I know," Parker said, "but you haven't got the guts. Besides, I'll behave myself." He looked intently at the young woman. "I just wanted to make certain they're real, that's all."

"Let's get out of here," Compton suggested. "There must be some way we can get a message through to these people. Perhaps someone in

the village—"

Hinckley nodded and motioned them from the house. Compton went eagerly, but Parker lingered. The air outside seemed cooler now, and its freshness seemed strange after the pleasant fragrance inside the house.

"Go back to the ship," Hinckley told Parker. "Compton and I'll go into the village."

"I like it right here," Parker said.

"We might need someone at the ship," Hinckley said. "That's an order." His hand caressed his rifle, as though daring Parker to refuse.

Parker grinned contemptuously. "Anything you say, *Captain*. If you need any help, just yell." He turned away and walked toward the rocket.

"Someday I'm going to kill him," Hinckley promised. He turned to Compton. "C'mon, let's see what the village looks like."

THE VILLAGE was a replica of the first hut, multiplied. Some of the huts seemed to have specialized purposes as stores or warehouses, but otherwise it was the same. People sat in the houses, listening to music or watching moving pictures swarm over their hut walls. Some occasionally ventured into the street. All of them ignored the Earthmen.

"I don't know what to make of it," Hinckley said finally. "We can touch them and hear them; they appear normal in all respects, but they seem to be operating on a different level of existence."

"I don't pretend to understand it," Compton said, "but I have a feeling I don't like, whenever I think about it. I'd rather meet bug-eyed monsters than this."

"I know what you mean," Hinckley said. "These people even though they're humanoid, are out of contact with reality—at least with reality as we know it. It's like some kind of mass hypnosis, with everyone in a trance except us."

"Think of how helpless these people would be," Compton said. "When we turn in our report, those who come out here with unhealthy designs won't have any opposition."

"We have a prime example of that on board," Hinckley said disgustedly. "We'd better get back to the ship; I don't like to leave Parker alone; there's no telling what he'll do."

When they got back Parker wasn't there.

"I was afraid of this," Hinckley said between clenched teeth.

"Maybe they've done something to him," Compton suggested nervously.

"That's too much to hope for. Chances are, it's the other way around. If I know Parker, there's only one place he'll be. C'mon."

Clutching his rifle, Hinckley ran from the rocket. Compton followed, a bit more cautiously.

Hinckley reached the lone house and peered into the bluelit gloom. He entered, gun ready, Compton at his heels.

"He's not here," Hinckley said, surprised.

The man and the young woman sat on the couch and casually

watched pictures move across the far wall. Hinckley, looking at the pictures, was not at all certain they weren't the reality and the natives of this place merely ghost images that might fade at any moment.

On the wall an empire was being formed. Tall buildings were raised by machinery that was unfamiliar to the Earthmen. Aircraft flitted across the sky like strange black birds. The buildings towered, the flying machines dove, spitting needles that exploded into blossoms of fire, and the buildings toppled into dust. People ran, screaming soundless screams. Columns of smoke rose to replace the buildings. The scene shifted. Great weapons were assembled and heaped carelessly. To the heap were added the skycraft and other weapons of war. The pile exploded, and the people rejoiced, clasping hands, dancing. The walls darkened.

Actual or symbolic? Hinckley wondered.

"What does it mean?" Compton asked him.

"I think," Hinckley said, "we've just been given a short history of their race. They built up a great society here, but a warring one. Finally, they outlawed all weapons in order to save themselves from total destruction. We could probably take a lesson from that."

"They'll probably be worse off when the Earthmen come here," Compton said. "Even if they could see and hear us, they wouldn't have any weapons left to defend themselves. We could loot and rape and—"

"I think we'd better forget this planet exists," Hinckley said slowly. "If we don't report it, no one'll ever know. It's one planet in a million planets. If we say it's empty, they'll believe it and never bother to check."

"But what about Parker?"

"Yes," Hinckley said in a disturbed tone. "Parker. We've got to find him before he does anything he shouldn't. He must be in one of the huts. C'mon. You take one side of the village, I'll take the other. When we find him, we'll blast off."

But they didn't find him. They searched through all the buildings, peered into all the faces.

"I don't like it," Compton said when they met. "The people may be helpless, but that doesn't mean everything on the planet is. We've got to get out of here while we've got the chance."

"Take it easy," Hinckley advised. "We can't leave without Parker. He's probably hiding someplace."

"Hiding?"

"Hoping we'll take off and leave him alone here. He'd be perfectly safe. He could take anything he wanted—food, drink, anything—and these people couldn't raise a finger to stop him; they wouldn't even know he was here, most likely. If I know Parker that's what he'd want. He wouldn't care about the people as long as he satisfied himself."

"We'll never find him," Compton said. "There's a forest beyond the village. If he got into that, we could search for months and not find him."

Hinckley shrugged. "We've got

to try."

Night came before they returned to the rocket.

Hinckley shook his head in the gathering darkness. "He could be anyplace out there, damn him."

"Let's get out of here," Compton suggested again. "Leave him here, if that's what he wants. Let him do what he wants here; what difference does it make if the natives don't know what's happening?"

Hinckley's look was cold. "We'll wait until morning," he said. "If he isn't back by then, we'll leave."

But the next morning, the rays of the alien sun found the white squatting houses silent; Parker had not returned.

Hinckley turned on the outer loudspeaker. "Parker," he said. The words crashed across the still village. "Parker, this is Hinckley. We're blasting off in five minutes. If you're not aboard, we're leaving without you."

After a few minutes, Compton said, "He's not coming. He's probably dead, and so will we be if we wait long enough."

"More likely, he's ignoring us," Hinckley said, consulting his watch. "He's got two minutes more."

Two minutes later, Compton said, "Time's up."

Hinckley nodded. He switched on the rocket motors. Deep within the spaceship a turbine growled; the growl rose to a whine.

"I still don't like to leave him there. Even though they don't know what's happening to them, I feel sorry for those people out there." He switched on the loudspeaker again. "Parker," he said over it. "Last chance. We're blasting off."

"He's not coming," Compton said shrilly, "he's not coming."

Hinckley touched a button. Flaming rockets drove their fire in to the ground. The great spaceship shuddered, rose on a column of flame.

"At last," Compton sighed. "At last."

"We'll have to come back, though," Hinckley said. "I knew we'd have to turn in a report, and now I know we'll have to come back here to find Parker, to jail him as a deserter, and perhaps worse. I hate to think of what'll happen to those people down there when the Earthmen come."

They looked into a viewscreen. Below them, the planet dwindled and became nothing.

FROM the edge of the forest, Parker watched the spaceship rise into the sky and disappear. He chuckled contentedly. He had won the game of hide-and-seek, and the planet was his prize. Earthmen always took what they could from newly discovered planets, only this time *he* would have first choice well ahead of any others. It would be months before an Earth ship would arrive. But he could last that long easily. Longer if necessary. During that time he could make up some story to account for his absence. They'd have to prove him a liar, and that would be difficult. Any story he made up would certainly be no less fantastic than this planet

certainly was.

Meanwhile, there were things to do.

He took off his cumbersome spacesuit and left it in a clearing in the forest; he wouldn't need that for awhile, and it would only hamper him. He was in no mood to be delayed. There were a great many things to do, but first there was one special thing to do. There was a girl, he remembered, a young woman in a small hut at the other end of the village. He licked his lips in anticipation. There was a man with her, but there was nothing he could do—nothing at all. Parker laughed loudly into the silence and trotted down the street.

When he reached the other end of the village, he walked eagerly into the house. The girl sat on the couch. The man stood nearby. The walls were unmoving and the blue fire cast a cold light about the room. The Earthman sat down beside the girl, and his hands reached out, unhesitating.

But suddenly the man said something in an alien tongue, a sound that was like a whiplash, angry and bitter.

Parker felt his throat tighten. "What?" he said. "What?"

He looked up into eyes alive with hate. No, that was impossible. It was only imagination. Only imagination, yet for a moment—he laughed guiltily—he'd thought the man was looking directly at him.

Furiously, angry at himself, Parker forced the thought from his mind. He reached once more for the girl, but she shrank from his touch and leaped up. The Earthman followed her movement with startled, puzzled eyes, and then his bewilderment changed to a fear that held him with cold fingers.

The man had taken a long silver knife from beneath his robe, and he held it in his hands so that its blade reflected the cold blue fire. His face was a mask, not pleasant to see. And he was looking at the Earthman, seeing him, watching him, hating him.

A sudden flash of understanding came. These people had known all the time. They stayed indoors in dim light to enhance the illusion and watch with greater secrecy, so that the movement of eyes would not betray them—and they had waited. For what?

Parker leaped up with a hoarse cry and ran, not waiting to find out. He was in the doorway when the silver knife caught him and slid easily between his ribs and released the breath of life that lay hidden there. Before he struck the ground, he was a shell, with neither fear nor desire to trouble him.

For a long moment afterward, the man stood over the still body, looking down at it with a mixture of hate and disgust. The girl joined him. He looked at her and then at the sky.

"We must learn to make weapons again," he told her. "These creatures will be back, unsuspecting, thinking us helpless. Next time, we must be ready!"

Without ceremony, they buried the Earthman's body and then met others of their kind coming into the village streets. There was work to do. • • •

Playing "Napoleon" can get to be a habit, especially when a man is devoted to pure science. Which was Dr. Whitemarsh's devotion—until Dr. Sally Chester came along!

The Laboratorians

BY EDWARD PEATTIE

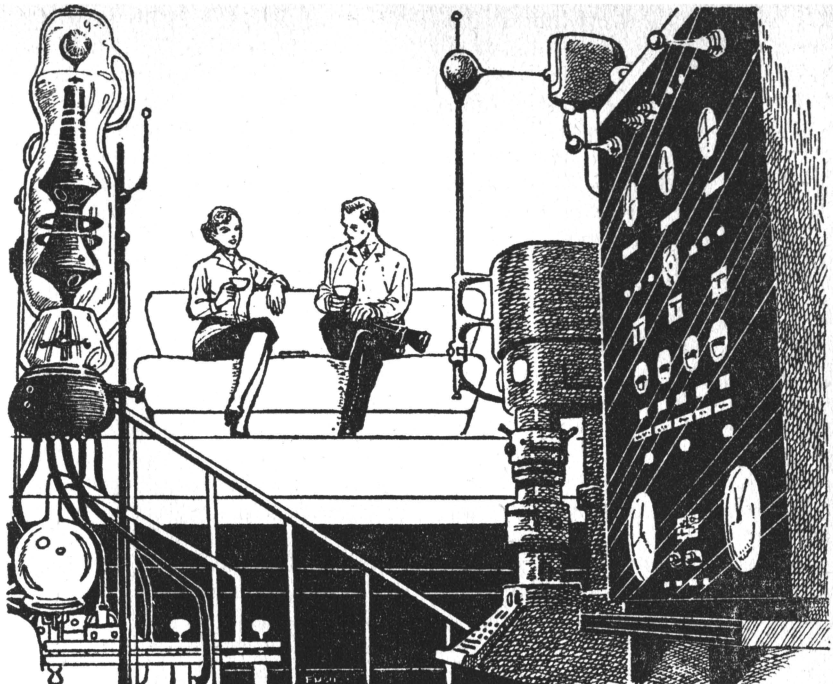
"YEAH, we drop in just three c.c. from this here tube," said Rocco as he expertly twirled the erlenmeyer flask and watched the color shoot past the methyl orange end-point. Whitemarsh was annoyed and said so.

"That's the sixth straight you've missed, and the acid comes out of the burette, not the tube; and you don't call the graduations c.c., you call them milliliters."

"Yeah? Well, here we call it a tube!"

"And why don't you go down to the end-point drop by drop?"

"Because the book don't say so! That's why! You technos make me sick. Here we do all the blasted



Illustrated by Ed Emsh

work, and you try to tell us how to do what we've been doing for ten years!"

Rocco was beginning to work himself into one of his famous rages. His bull neck was beginning to redden; his eyes started to flash. His entire squat body started to quiver.

Whitemarsh wasn't impressed. Over at the atomic plant, Phobus's Quercus Mountain, he had bossed a pretty quarrelsome crew of isotope wranglers. He had never dodged a fight in his life. But this was in a chemical laboratory and it surprised him to hear the assistants talk back.

The only assistants he had ever known were clear-eyed youths taking a year away from their studies to recoup their tuition money and who tried to copy everything the chemists did. But Whitemarsh was new to the Interspatial Research Center on the Moon, and he still could not figure why the assistants acted as they did. So he waited.

Rocco banged the flask down on the stone bench, glared at Whitemarsh for an instant, and then rushed out of the Laboratory, muttering a few obscenities.

"Queer place this," mused

Whitemarsh, filling up another flask and finishing the titration himself. "Here the helpers tell the chemists what to do and get mad if we ask them what they're doing."

He started to look over Rocco's notes and ruefully decided all the work would have to be done over again. He was interrupted when a girl opened the door. In the week he had been stationed at IRC, he had been introduced to so many scientists that he had forgotten most of the names, but he remembered all the girls. His former Atomic Plant at Quercus Mountain had had all too few for him not to appreciate them now. Miss Sally Chester was a statuesque chemist with long blonde hair and a luscious figure which she hid under a white lab robe. He managed to stammer some sort of greeting.

"Why Dr. Whitemarsh!" She seemed somewhat puzzled. "You're not actually working with your hands?"

"I sure am, unless we're both space struck. Why not?"

"Well, I suppose it's all right other places, here we let the Laboratorians do all the manual work. It's sort of their privilege."

"Yes, but their technique's lousy. I sat here this afternon and watched that blow-hard Rocco muff six straight end-points in a row and when I asked him how come, he blew his top!"

She laughed at that. She sat down on the lab desk and said, "You're absolutely right. Antonio Rocco's color blind and always misses his Methyl Orange end-points. And he's been doing them for ten years. But it hurts his feelings to be criticized, you should have been more diplomatic. He's probably gone to complain to his boss!"

"His boss? Aren't we his bosses? On this sheet he's listed as my assistant."

"Actually yes. But traditionally the shop foreman is the leader of the Laboratorians. He certifies them to see that they know their work, signs their time cards and tells them when to take time off. Of course we outline the work they do, check their results and write reports from their data. Normally we come into the lab as little as possible."

"But Sally, how the hell do we know that their results are right? This mixed-up outfit is in the hands of a bunch of left-handed prima donnas who don't know Beilstein from Budweiser!"

She smiled again (and he thought of the ads for Stargleam toothpaste). "Let's go over to the Scientists' Snack Bar and get a cup of coffee, and I'll tell you a little about the history of this laboratory."

So he let her lead him out of the individual laboratory into the pastel blue corridor where they followed the spiral runways to the glass enclosed Snack Bar.

Here they sat on pale leather chairs and looked out over the expanse of the Central Laboratory. From where he sat, he could see a square mile of magnificent equipment: Serpentine condensers, enormous distillation columns, molecular stills, ultra-centrifuges, electron microscopes, all were spread

out before him. Surrounding the central laboratory were the innumerable railings of the corridors leading to the individual offices. Upstairs and downstairs strolled scientists and Laboratorians respectively, all obviously contented. He turned to face Miss Chester who was lolling in the chair beside him. She had poured him a cup of coffee, given him a plate of rolls and was ready to talk.

She reminded him that in 2005 it was found necessary to build research laboratories on the Moon to avoid the guided meteorites which the Aliens had been hurling toward the Earth. Since there had also been a shortage of trained scientists, it was necessary to train apprentices to operate the complicated laboratory equipment . . . to perform the operations without bothering themselves with the theory. The Laboratorians were needed and they did a good job running specification tests on all the equipment necessary for the interplanetary war. After the war, the Interspatial Corporation had made it the Central Research Laboratory, since this had been the largest aggregation of instruments ever gathered together, and in the ten intervening years, the numbers of college-trained scientists had increased almost ten-fold. As long as the Laboratorians confined their work to the equipment they were familiar with, they were unbeatable. To guide them they had the Book, as the Technical Manual of the Interspatial Corporation was known, and the Laboratorians followed its procedures to the letter.

"But they don't know *why* they're doing things," Whitemarsh interrupted. "The manual's been in need of revision for the last five years, and research workers don't use the same tests all the time!"

"Well that's right," admitted Sally without disagreement. "I usually have my particular laboratory instructions mimeotyped and bound in a little book. I've also got the instructions so fixed that if they do things wrong, I can catch them. And I've learned not to modify my instructions orally. That only confuses the men and results in chaos. With a little planning, you can get good work done, and if you don't mind humoring their whims a little, there's no reason why you can't get along with them."

Whitemarsh wasn't so sure. He had no objections to jollying his subordinates, but he did draw the line at sloppy lab technique. He escorted Miss Chester to her own office, thanked her for the briefing, and then started to worry on his own. He took the speed elevator up to Dr. Sheridan's office.

The Laboratory director was sympathetic. He looked at the broad-shouldered young giant, Dr. Whitemarsh, and reflected that this man was rated the most promising scientist the Interspatial Corporation ever had.

"You're damn right, Whitemarsh," he told the younger man, pushing him into a chair and offering him a cigarette. "I've been here three years and spent the first two fighting the system. Maybe the trouble goes back to our Board of Directors. They're all so proud of

this shining Research Station on the Moon, that they hate to admit that anything's wrong. They've got the Laboratorians responsible to the Lunar Mines Service—and there it stands.

"So the only thing we can do is wait. Lo Presti the Master Mechanic is up for retirement next year and there's going to be a big organizational shake-up. Hold tight. After that we may have a free hand."

So Whitemarsh thanked him and bided his time. He released Rocco back to some other scientist and did his own laboratory work, even though the Laboratorian Council made a written protest. He also spent many hours in the excellent laboratory library, reading all the reports coming out of the Lunar Laboratory over the past ten years.

His discoveries amazed him. Theoretically the Lunar Lab had one of the best collections of scientific minds in the Solar System. Every Earth university was represented on its staff. New techniques and products had poured out of the Laboratory during the ten years of its existence, yet every one of these had been based on doubtful data. Certain things worried him. First, notes were kept in a very cavalier manner even by the most experienced scientists. Secondly, the younger chemists and physicists never had been exposed to any practical laboratory work after their student days, and consequently had no means of judging the technique of their assistants. Finally, the Laboratorians were apparently proud of their ignorance, displayed a contempt for "paper work" and were only too willing to fix their results if they thought they could get away with it . . .

He did not let his social development slide either. Lunarport was far more advanced culturally than the crude settlement on Phobus. Here Dr. Whitemarsh was able to have a luxurious apartment in the New Dome sector, could hear lectures and concerts, and could even indulge in winter sports such as skiing in the lava around the craters (protected of course by a heated suit and an oxygen mask.) He found Miss Chester a satisfactory companion for such endeavors, even though she spoke little of her private life or how she had avoided marriage in her twenty-five years. But he played a waiting game with her as well as with the lab job. He admitted to himself that a research chemist's life at Lunar Lab was a pleasant one, particularly if one didn't care how accurate one's results were. Unfortunately, the same quirk which had driven him into science also made him suspicious of all easy methods. He had never recovered from the shock of discovering that just because a reaction worked in a book, it did not necessarily have to do so in a laboratory.

DR. WHITEMARSH'S promotion came within five rather than six months. There was some grumbling among the older scientists, but there was not much they could do about it. Kercheval, who had twelve years' service on the

Moon, did not have his Ph.D and did not care particularly for executive work. Neither did Sturtevant with a doctorate and ten years service. But others objected; even Miss Chester, long one of Whitemarsh's defenders, felt that the older men deserved at least the chance of refusal. (It never occurred to Whitemarsh that she might have had some ambitions of her own.)

He called the group leaders together for a conference the day after his appointment. He was now ensconced behind Sheridan's desk and was not yet accustomed to having a secretary. The leaders came in grim and resentful. He wasted no words.

"I'm going to reorganize the setup to get the Laboratorians under us, whether they like it or not. This sloppy technical data and unsubstantiated findings is not my idea of a good lab—nor yours, I'm sure. It's up to you to show it during the next year. Meanwhile you've all been pushed up fifty dollars a month in salary. So long!"

His next step was to call on Lo Presti. The Master Mechanic's Office was outside the Lab Dome near the Shaft of Lunar Mine No. 1. The old man had been in the preliminary Selenium exploration party and never could forget the old days when he drove the men and robots to find the metal that paid for the cost of the Expedition. The President of the Home Office, Dr. Barker, had never forgotten either, and Lo Presti was always taken care of. The 200 Laboratorians probably caused him more headaches than the five thousand miners ever had, since a delegation visited him every day or so now that Dr. Whitemarsh was rumored in.

But the Lo Presti knew that times change too, and realized that the brawling space adventurer did not fit into a sleek world of test tubes and retorts. Ninety-five years old and arrogant as ever, he sat in his office and greeted Dr. Whitemarsh with a bonecrushing handshake. He offered a cigar and Whitemarsh thanked him, lighting a pipe instead.

"I hear from the boys you've been cracking down on them," he stated.

"No more than you would if you'd been there yourself. What would you do if a driller split a core?"

"Why I'd give the careless sap a clout that would wake him up. But the Laboratorians aren't drillers!"

"That's right, but that's the way some of them are muffing their work."

Lo Presti eyed him appraisingly. "Aren't you the same Whitemarsh who capped the crater on Phobus last year?"

"I sure am. And your Laboratorians are a bevy of Nice Nellies compared to that mutinous bunch of space rats I had with me."

"Well, maybe you're the man for the job at that. The guys don't put out anymore. Used to be I knew all the gang. I'd look around and see when they were goofing off. Now they're all such experts, I can't tell if they're loafing or just thinking." They both laughed at

that. Whitemarsh thought it would be a good time to say: "I don't want to do anything to your boys for a while until I get my own gang straightened out!"

"Don't kid me, Doc," responded Lo Presti, "you know when I retire you're going to move in and crack down. Well I'm with you!"

So they parted friends.

Whitemarsh went back to his office in a happy mood. True, Miss Chester had been avoiding him lately and he had to drink coffee by himself but he now had and the foremen on his side and the front office. Now was the chance to reform the laboratory.

His first bombshell was the requirement that all the junior chemists should take a qualifying examination. That really caused trouble in paradise. Apparently, all of the younger set had thrown away their books on graduation and remembered only their own specialties. Whitemarsh, from being a pleasant companion at the Snack Bar who discussed skiing and spaceball, had now become an ogre of the first water. The senior chemists chuckled, since they were exempt, and the Laboratorians guffawed aloud to see their harriers in turn harried. In any event there was frenzied activity in the month before the examination and the library staff did yeoman duty. And, no one had threatened to quit. At least almost no one. Whitemarsh was musingly staring out of his office's Plastoid window at the green eye of Earth when he heard a commotion outside in the anteroom. He looked out to see Sally Chester, and he sensed that their relationship was less than idyllic.

"Let me see that egotistical ass, Whitemarsh," she shouted at his secretary who cowered in silk clad finery as the white-coated Valkyrie charged by.

"Be calm," he advised her, placing himself strategically behind his desk.

"Calm," she screamed, "how can I be calm when an officious busybody starts getting drunk with power and acting like a Twentieth Century dictator? After all I've done for this stinking Lunar Lab, how come that I have to take an exam in freshman chemistry?"

"I thought you were exempt," began the chastened director.

"Sorry, your honor! Your order says five years at Lunarport. I've only been around this sweat shop for four years and six months. What are you going to do if I fail? Throw me out and I'm moving over to Campo Sano with every one of our trade secrets!"

"I'll get you exempted," he offered.

"What, and have the other chemists cry favoritism? Not on your life, you coffee-swilling Judas," she yelled. "And stop grinning at me like a Cheshire Cat!"

He did not answer. He was content only to admire her in her rage. Her usually mild face was flushed through the tan and her graceful hands were tightly clenched into fists that pounded on his desk.

"Answer me, you moron!" she shouted. Then she started to cry. Within one minute the seething Amazon had changed into a de-

fenseless white-coated girl cowering in the visitor's chair, weeping bitterly. Whitemarsh approached and held her hand.

"Listen, Sally," he told her, "the only reason I was going to let you out of the test was because you know more chemistry than any of the scientists here. But go ahead and take the test; you'll get the highest grade!"

She brightened, "You think so?"

"Know it," he affirmed gallantly, "now, how about going to the Space Opera at the Symphorium tomorrow? Kluchesky is singing in *Pomme de Terre.*"

She stiffened slightly and stood up. "Listen, Mr. Frank Whitemarsh! Privately you're not a bad guy. You even had potentialities. But you're a hell of a failure as a boss and the less I see of you, the happier I'll be. Good-bye!" And she was gone. Whitemarsh resumed his contemplation of the Earth with less interest.

THE RESULTS of the examination might have been foretold. The intelligent and professionally alert junior chemists retained enough fundamentals to do well. The majority failed the questions on laboratory technique. Consequently Whitemarsh enlisted the aid of the older men to conduct a series of refresher lectures to bring up to date the scientific knowledge of those who failed. The Laboratorians were delighted with the spectacle presented by these lectures, and loved going home at night while erstwhile bosses sat listening to Dr. Sturtevant discuss "The Theory of Washing Precipitates", or to hear Dr. Whitemarsh talk on "Balancing the Redox equation." The Laboratorian's happiness lasted until one day in October.

That was the day that Lo Presti retired. The old man was given a small space ship by the Corporation and a space-time chronometer by the Laboratorians. Then he sorrowfully said farewell. The next day the Laboratorians were absorbed into Research.

Somebody had to plan for janitor service, figure where to place time cards, design new proficiency ratings and decide on such complex matters as where the Laboratorians were to hang their coats. All these services had been provided for by the miner's shop organization. Whitemarsh stayed late at night for a week arranging the new payroll plan and raising the salaries somewhat.

All this was handled, if not without incidents, at least without violence. Even the janitors and secretaries were now part of a team. All but Miss Chester. She had stopped speaking to Whitemarsh in the halls and had been seen in the company of a younger (and Whitemarsh felt) better looking physicist.

Then Whitemarsh dropped his second bombshell. The junior chemists were ordered to rate the Laboratorians for proficiency! Fresh from six months' study under such taskmasters as Whitemarsh and Kercheval, the chastened scientists were now able to interpret the antics of their tormentors of yes-

terday. An old tradition had fallen and the howls extended back to the Front Office on Earth.

For a change, Miss Chester did not object. She was evidently past all comment. She merely wrote out a list of the faults and virtues of all her assistants, rated them all Excellent and went back to her research.

But Rocco was tried and found incapable of running titrations. Harry Crowe was found to be weighing incorrectly, Zachary had been fixing his calculations for the last ten years and even faithful Bruno had been found to be adding 15 to all of his Iodine numbers in order to pass the specs easier.

It suddenly occurred to every one that all the laboratory's reports were based on incorrect data. All work stopped for a week until the scientists found what their assistants had been trying to do all along. And the results were a bit terrifying. When Kercheval found that an incorrectly calibrated reflectometer had negated five years of his pet project, he tore up his notebooks, flung them on the floor and stalked into Whitemarsh's office.

"Frank, I'm taking my back vacations and going to Venus to forget it all for about six months. And mind you, when I get back I don't want to see my present assistants. I'm going to start from scratch."

He left, banging the door.

Next was Sturtevant.

"Frank, we've got to get Interstellar Review to hold my last paper. I want to recheck the melting points of some of those diazo compounds."

Then came the young physicist, Dr. Slezak, who was rumored to be Miss Chester's present skiing companion. "Dr. Whitemarsh," he stammered, "I'm not sure about the data on my last report."

"Didn't you take it all yourself?"

"Yes, but I used some of Kercheval's data for my fundamental calculations and, if that's wrong, all my conclusions may not be valid."

"Stop worrying," Whitemarsh told him. "When Kercheval recalculates his values, you can revise your own report. As long as your own work is right, you have nothing to worry about."

The young man left, nervously wringing his hands. Whitemarsh couldn't see what Sally saw in him. He figured she ought to be along by now.

She was.

"I told you so," Sally said theatrically. "You've got the whole lab mistrusting each other. All the chemists are quarreling like mad and the Laboratorians all look like whipped dogs. You've pulled the chair right out from under everything and you sit here gloating."

"Relax, Sally," he told her. "They're just growing pains. Take it easy and ride out the storm . . . Now, how about tearing over to Lunar 7 to see the crucial Spaceball series between the Space Rangers and the Callisto Satellites?"

She looked horrified. "I'm afraid you don't take hints very well. I'm not interested in going anywhere with you. Actually, I'm going with Jack Slezak to see 'Nova of the

Leprous Soul', and I might suggest a fit subject."

She flounced out again and Whitemarsh felt lost. He tried to cheer himself with a book on *Hyper Plutonium Elements.*

The transition took longer than Whitemarsh had bargained for. After the Laboratorians were re-educated, and a tiresome process it was, chemists went over the note-books to look for inaccuracies, doubtful data was examined, all microfilms had to be edited and corrected; and they found that most of the chemicals developed at the laboratory in the past decade had been founded on doubtful data. But since all of them had passed the Development Group, Whitemarsh didn't think it was wise to try to recall them. But new products scheduled for release were re-examined and retested after the fundamental work on them was checked.

Finally the problems were unscrambled and the laboratory began to run smoothly again. The research projects were reestablished and the work started out anew. Frayed tempers were soothed and the scientists finally got around to trusting each others' results again. The Laboratorians were now carefully but tactfully watched by the junior chemists who, in turn, were spending more time in the laboratories and less in their offices.

When the new, sound results started grinding forth, Whitemarsh permitted himself a sigh of relief. Lunar Lab had lost its individuality, he admitted, even though the easy-going camaraderie he had noticed when he first came was also gone. The results of Lunar Research Lab of Interspatial were now as reliable as those of the *Campo Sano* and *Roque* laboratories back on Earth.

But it had been a hard fight. None of the chemists ever stopped around his office any more for small talk about sports and politics. His secretary brought him coffee in his sanctum sanctorum and he did not find himself wandering around the laboratory as he had formerly done. When he did, there was usually a restrained silence and a suspicious neatness. Miss Chester was apparently irrevocably lost and there were rumors of an engagement with the brilliant Dr. Slezak. Though he had won the day, he had lost something too. The Lab was now able to turn out results, but Frank Whitemarsh had paid a personal price for it's new efficiency.

ALMOST a year after taking over as Research Director, Sheridan, now a Vice President, brought him some news. "Get ready to pack, Frank," he told the younger man as they sat and smoked in the director's office watching the clouds moving over the Earth.

"The Front Office like what I did?" asked Whitemarsh puffing on his pipe.

"Well." There was a slight pause. "All the scientists on the board are behind you to a man. But the business men, the advertising boys and accountants, well . . . you know how they are."

"What's eating them?"

"The lab didn't release any new products this past year. Development and even Advertising are pretty much slowed down."

"That's right. We've got some good products about ready, but we're making a final check before release. Don't you think we sent out a lot of junk before?"

"We sure did, even in my time though I tried to stop it. But the development boys want something, anything."

"Well?" asked Whitemarsh.

"So they'd probably rather run the risk of getting something bad than nothing at all."

"They won't!"

"That's right, they never will again. Now, I know that the products you have ready are going to be good and I'm not worried about them. All we have to do is keep the business geniuses out of our hair for another six months."

"And?"

"So we're kicking you upstairs. It's a good job, don't worry about that, at three times your director's salary."

"What if I quit?"

"Don't be that silly."

"What's the other job?"

"Works Manager at Quercus Mountain on Phobus. Sole boss of the biggest Isotope Works in the Solar System. You'll have 50,000 men under you and have a free hand at starting any kind of laboratory you want."

"No Laboratorians?"

"Right. You can start out from scratch and make the kind of lab you've always dreamed of. Here we're thinking of pushing up Kercheval if it's all right with you, you always rated him highly. It's just like changing Spaceball managers. We all know the Space Sox won the pennant last year on the team developed by Kanter even though Balhiser was manager. These wolves will keep off our tail until the new products start coming through and then we'll say we knew it all along."

"You've got me half convinced not to quit," said Whitemarsh quietly.

"Now listen Frank," came back Sheridan just as seriously, "you're too good a man to waste. Now take your promotion like a nice boy and keep in line."

"I still think I did a good job here."

"So do I, but the Board of Directors can't forgive those retractions, even though you and I know they're necessary. They don't know what scientific truth and pride are. Within ten years, on the foundations you laid, we'll have the best research record in the country . . ."

After Sheridan had left, Whitemarsh cast a last look at his former domain. He called Kercheval in to give him the news and then tell him to keep quiet until verified. Then he decided to take a last tour around the laboratories. He finally found himself up at the Snack Bar and his eyes were taking the same look over the Laboratory that they had done two years before. The view looked about the same. He had supervised the installation of a new Matter Probe over in the front center and he was responsible for

the Atom Analyzer, but these were only minor changes.

The major change, he thought bitterly, is that no one speaks to me unless spoken to—I've become a pariah. Never tamper with the status quo, it disturbs too many people. It's a very lonely job.

There was no one else in the Snack Bar. At least, almost no one else. He heard a discreet cough behind him. He turned and found Miss Chester seated behind him. She had her legs crossed, a cup of coffee in one hand and the Space News Want-Ads in the other.

"Hello, Napoleon," she greeted him. "Have you just been surveying your empire? Did you see the stern men of science jumping through the hoops out there? Can you remember the happy place this was a year ago when you came? Then the Laboratorians took pride in their work; now they're flunkies for the green kids fresh from Alma Mater!"

"Stop it, Sally," he told her. "You're not too far wrong on that Napoleon business. I'm taking off for my new St. Helena, Quercus Mountain on Phobus."

"Quercus Mountain? That's a big place. Lab Director?"

"No. Works Manager."

"Heaven help the poor Atomic workers!"

"Don't be that harsh. Dammit! Sally, maybe I am a Napoleon, but scientific accuracy is too important to play fast and loose with, the way they were around here. You know it. You're the only one who didn't relax that vigilance—who saw to it that everything you turned out was without error. I know now that I forgot the human equation—that I was so eager for errorless research that I trod pretty roughshod over a lot of people. But you're guilty too, you know, you had the secret—you managed to balance the equation when everyone else here didn't. Why didn't you help me? Sure, you came in and ranted and raved at me—called me all sorts of names, but you didn't help me, you didn't try to show me the way."

"I—"

"Let me finish," he interrupted her. "I love you, you know—have for a long, long, time. I still need help, Sally. I don't want to keep playing Napoleon and going into exile over and over again. A bigger job with more men under me isn't the answer. When a man is lonely it makes him hard and cruel in circumstances like that. I made all of you here relearn scientific facts, I need to relearn the humanities . . ." He paused for a moment. "Sally, will you teach me?"

Her eyes were bright with unshed tears and a catch in her throat made the words husky and half-whispered. "I wanted to help—I love you too—but I thought you were arrogant and didn't need me—" She swallowed, controlling a sob. "I'll make it up to you, darling. You won't be alone again—on Phobus or anywhere else in the galaxy." • • •

All that is human must retrograde if it does not advance.—*Gibbon*

Fear is often Man's greatest enemy. But when there is nothing left to lose, there is everything to gain . . . And with everything to gain, where is the enemy?

THE OUTER QUIET

BY HERBERT D. KASTLE

HE LAY on the cot, listening to the breathing of the six men who shared apartment 2-B with him, and the panic fluttered deep in his stomach, threatening to break upward and out in a wild scream. He fought it by telling himself it was foolish for a man who had lived through the destruction of New York and eight months imprisonment to feel this way.

He peered toward the window and tried to see the morning sun; not as a pale, shimmery fog but as the bright Spring yellow he knew it was. But the fog remained, no matter how many times he rubbed his eyes with saliva-wet fingers. It was as if he were seeing everything under water—a world of shimmery, hazy objects.

The panic rose again. The Conquerors' beam had done its work well, and his chances of finding Adele before death found him, were now terribly small. The first punishment had brought only a slight blur, this one had almost blinded him, and it was only a matter of time before he committed the third offense. It made no difference that Conqueror Punitive assured

all trainees that the degree of blindness decreased as the years went by. He knew that his third offense would come sooner than any improvement in his ability to see. And the third offense was punishable by death.

Before another rush of fear could churn his brain, the morning whistle sounded. Shrill, commanding, it began each day of aimless wandering—the silent stroll over pavement connecting the five buildings of what had once been Brooklyn's prize housing development; a constant walk which destroyed those Americans unable to show complete obedience and turned the others into slaves.

Again the whistle shrieked, and the room filled with coughs, groans and sighs, for it was forbidden to talk. Only when one of the many rules had been broken and a card

Illustrated by Ed Emsh

bearing the trainee's number was found in the box outside the door did some American get a chance to speak. He would rush instantly to the small administration building near the wall's only exit and report to the squat, gray-uniformed Conqueror known as Punitive—the only Conqueror the trainees had ever seen. After an explanation of the offense in too-precise English, the trainee was told to sit on the stool facing the light tube. "I obey," he would croak. In silence broken only by the hum of electric generators in the basement, the beam of piercing white light would sear his eyes. Afterwards, the assurance about the disappearing effects of the beam; then back to the streets.

With *only* Punitive representing them, the Conquerors weeded out Americans who would not or could not obey. The vaguest suggestion of communication between trainees was picked up by the detector bulbs—the see-and-hear-all devices which hung much as oversized light bulbs from the ceiling of every room, and stood like dead street lamps every fifty feet or so along the pavements.

George lay a second longer, then twisted his tall, slim body erect and sprang to his feet. As he slipped into the thick stockings, high-topped shoes, and one-piece coveralls with serial number stitched in large red numerals across chest and back, he began sounding deep in his throat. This was so slight a touch of the vocal cords that no detector bulb or other trainee could hear it. But it was something more than thinking; it was listening to a voice repeating all the things that had mattered before the Conquerors' surprise attack atomized New York City. It was his fight against non-entity.

"George Lowery," he said, "thirty-two, top salesman at Brady's Men's Shop, resident of Babylon, Long Island, owner of 12 North Rector Drive, husband of Adele Lowery, and today you may see her." But the last phrase stuck in his throat and he had to repeat it several times. Even so, he couldn't convince himself that the most important part of his ritual was true—that perhaps he would see his wife as she walked the streets.

Two days ago he had turned the breakfast table to stone by asking his neighbor to pass the water. It was nothing more than a mistake—a stupid thinking aloud. But yesterday the card had been in the door-box. He had visited apartment 1-A in the Administration Building and, for the second time, the thin beam of light had seared his eyes. Now he was no longer sure he would be able to recognize his own wife.

"George Lowery," he sounded, fighting off the panic. "George Lowery," and he turned and moved through the now-empty rooms.

He was last in line outside the bathroom and waited dully for his turn. The men in front of him were nothing but tall, short or in-between nondescripts. The old group, of which he was the last, had been different. They had looked at each other with meaning, with hope. After six months passed, and realization came that

no opposition to the Conquerors was in sight, they went out in one mad day of talk. He had watched silently, refusing to respond to the suicidal good morning's, pardon me's, and salty discussions of Conqueror Punitive's parentage.

Not that life in the project meant anything to him. It was just that he had to see Adele again—to assure himself that she still remembered their life together. If her love had been stamped out, then the Conquerors were right in their men-live-by-bread-alone theory, and he was only one of a few remaining misfits—a breed as expendable in the battle for survival as the great, pre-historic lizards had been.

He hadn't been in the bathroom more than five minutes when the third whistle sounded. With his beard still wet he rushed out of the apartment, pausing only to check the empty door-box, then ran down two flights of stairs to the street. It was windy for a morning in June and his face felt cold where the damp hair covered it. The Conquerors allowed nothing that could be used as a weapon to fall into American hands, but even after eight months he was still not used to his light brown beard and long shaggy hair.

Hurrying through the street, following the one-way arrows which kept the trainees moving in the same direction, around and around the project, he felt the panic well up again. He made a wide detour of the excavation area which lay in the center of a rough square formed by the four apartment houses and the Administration Building. This forbidden area had been the cause of his first visit to Conqueror Punitive. Some two months ago, right after the last shipment of fresh trainees arrived, he had seen a group of women obviously new to the project, rigid in their terror of this silent hell, walking right in the direction of the excavation. Without thinking, he had shouted a warning which stopped them from committing an offense.

By the time he reached the basement of building two, he was gasping for breath. If the last whistle sounded before he was seated at one of the long wooden tables, it would mean the third offense. There wasn't any light-beam treatment for that one; only an electrode clamped to the head and the oblivion of thousands of volts of electricity.

He went down the flight of steps into the basement which was dining room for all the male prisoners, and grasped a spoon, cup and plate from the tinware table just inside the door. The benches nearest the door were filled, but he didn't have time to go any further. Just as he plumped between two trainees, the whistle sounded.

He sat still a moment catching his breath, feeling the thin bodies adjust themselves away from him. Scooping some cereal from one of the center pots, he began to eat. The first mouthful stuck in his throat and he hastily filled his cup. But when he had gulped down the sugared water, a wave of nausea made him gag. He sat gripping the edge of the table, his head spinning. And thoughts crept into his mind

—thoughts and questions he wanted to keep out.

Why were the trainees being starved? If the Conquerors wanted to kill them, it would be simple enough to use the quicker and less expensive method of firing squads. The training area was proof that they wanted workers for their new world. And despite the hunger which made hollow-eyed skeletons of them all, the men and women walked straighter and with definite confidence. Their lips were sealed shut, their eyes flickered observantly, their heads were always rigidly forward. Except for a few lingering misfits like himself, the group conformed as well as humans ever could. Why then the delay in releasing them as had been promised?

He screwed his eyes around and tried to see the other tables. Those even a short distance from the door were almost empty, and further into the hall they seemed deserted. He had no way of knowing the total number of men, but he was sure there weren't more than a hundred—out of an original five hundred. If the same proportion held true for the women, there were less than two hundred Americans left in the project!

He twisted his eyes to the person on his left. The face was that of a boy in his late teens—the beard spotty and thin. The head barely moved as he chewed, he held himself rigid, his hand moved up to his mouth in a straight line and down the same way—he ate like a machine.

George swung his eyes to the right. Another young machine turned out by the Conquerors. But was it only to be starved to death that these men, most of them so young, had obeyed? It made no sense and this, more than the conformity to slavery, terrified him.

But his terror lasted only a moment. What had he to do with whether they lived or died? He was finished; all that mattered was seeing Adele.

He picked up his spoon and ate until the whistle shrieked its order for the walking to begin. Then he rose with utensils in hand and was carried to the door in the silent rush. As he dropped his tinware into the barrel of chlorinated water, he thought with bitter amusement that there was nothing for the Conquerors to do anymore—hardly a full day's work for three or four men in operating the project now.

WHEN he walked into the street, the sun was warmer. It was a beautiful day; almost summer, he thought, and he breathed deeply. But the smell of fresh growth was not in the air—only the dusty, burnt odor of the ruined city beyond the walls. The sun grew brighter by the minute and he found it increasingly more difficult to see. It was as if the rays shattered into blinding blobs as they struck his eyes. Somehow, he knew he was using his ears more than ever before.

Poor compensation, he thought. There was nothing to hear—no way of finding her by listening. And besides the absence of speech, there was the absence of *any* sound.

He forced himself to place one leg after another, and all the horror in the world crept into his brain. He wanted to turn around and speak to those in back of him—to stop the one-way tide of stroll and ask some questions. Just when had the last plane blurred by with jets roaring? And when had the Conquerors marched outside the wall, boots thudding, rifles clanking on canteen pack and buckle? When was the last atomic blast—a distant rumble causing the ground to tremble beneath the pavement?

Months; two or even three, it seemed to him. His long legs faltered and he almost stumbled. Then he remembered his one purpose, and pushed the thoughts from his mind.

By alternately hurrying and slowing his steps, he was able to pull alongside some trainees and let others catch up with him. With sidelong glances he tried to find Adele. He had to see her—to convince himself that she had not forgotten the happy years together.

It had been between buildings three and four—the women's living quarters—that he had seen her that first and only time six months ago. He was walking quickly and pulled up beside her. One sidelong glance was exchanged and her face had filled with terror. Then she almost ran from him. He followed, but the weird chase ended after she actually turned to look back.

Afraid she might commit further offenses in her efforts to avoid him, he had slowed his pace to a crawl and soon lost sight of her after turning a few corners. Now his time was running out and he had to see her. She should be wiser in the ways of the camp; they could exchange a glance and separate. But that glance would tell him whether or not she too had become a machine.

If she's alive, a corner of his brain whispered. But he refused to think of her as being dead.

The sun was getting hot and the faces he looked at were indistinguishable in their blurry outlines. Nausea and dizziness returned and he could no longer concentrate on his search.

It's too late, he thought. The second treatment had finished his chances.

He tried thinking of other things, to remember his feelings from the time of the blast to the day he had passed through the new brick wall into the project. But all he got was a blur of fear. Fear then, fear now, and fear until the day they would kill him.

"Sick of fear!" a voice rusty from disuse rasped out. "Sick of the whole mess!"

It was with a sense of complete surprise that he realized his mouth was open and it was his own voice shouting.

"It's over," he rasped and turned around to face a startled, thin-faced woman whose blue eyes peered at him—but not with terror. He looked at her, his mouth sagging open.

"Over for both of us," she whispered, and moved toward him with arms outstretched and trembling.

He tried to turn and run, to save her from further violations, but she

grasped his hand.

"George." And she was in his arms. "My third offense—when I stopped walking. There's nothing to lose now."

The shuffling of feet continued about them as they embraced, and she talked hurriedly as if afraid that the few hours before the evening meal would not be enough for all she had to say.

"I've walked behind you all these months. I was sure you would say something if you saw me and I didn't want you to be punished. Each morning I waited until the last moment before leaving the women's dining room—until you came by looking for me. Then I'd walk behind you, sometimes within touching distance. Once I had to wait too long, and then I went to Punitive for the second time. But it was all for nothing. I hoped you would go free, but it was all for nothing."

He kissed her then and she had to stop. When he took his lips from hers, they both turned to the nearest detector bulb. They were being watched, but what difference did a thousand violations make now?

She was talking again, and actually smiling. "You look distinguished in a beard!"

He laughed, and saw the nearby trainees pick up the forgotten sound. He took her lips back to his own and heard the shuffling feet slow down all around them. And the fear was gone.

"Let's go to the excavation," he said. "We'll sit down at the bottom in privacy and talk and laugh. We're free, Adele, and the rest doesn't matter now."

He put his arm around her waist and they strolled against the pattern, the rigid walkers parting before them. When they reached the huge pit he kicked at the OFF LIMITS sign and was surprised at how easily it fell. Then he took her hand and moved down the steep, sandy slope.

It wasn't until Adele moaned and closed her eyes tightly that he saw that the bottom of the pit was covered with stones—and clean white bones. The blood pounded in his temples as he stared at the piled skeletons and chemical stained earth. And the few hours of peace was no longer enough.

Adele helped him pick up stones, until his hands and her cradled arms could hold no more. Bulbs, at least, could be broken.

Up they climbed, and when they reached the pavement there were many trainees shuffling slowly past the spot where the sign lay.

He threw the first stone at a detector bulb while still some distance from it, and his ruined eyes failed him. But the next time he stood directly beneath it and the shattering of glass seemed as loud as the atomic blast had been. Down the street they went, smashing bulb after bulb, retrieving their missiles so as to have enough to last. And all the trainees moved slowly behind them, on up to the last bulb in front of the Administration Building.

The new sound was a sharp crack, and someone screamed in a rusty voice. He turned to see one

of the crowd twitching on the pavement, then followed the faces turned up to Conqueror Punitive's window. There was a shadow there —a shadow with a rifle.

"The last bulb," Adele said. "Smash it."

He drew back his arm and the crack of rifle fire reached him a second after the hot streak creased his shoulder. But he wasn't hurt, and threw the stone.

As the glass shattered there was an eruption of strange language from the building—a terrified shouting. The trainees stopped walking, then broke into frenzied movement and hoarse shouts. They pushed George and Adele aside in pursuit of the gray-uniformed figure running toward the gate. The third shot was inside the building, and then the crowd picked up the fleeing Conqueror. His screams died quickly.

Into the building the Americans poured—shaggy skeletons shrieking hatred. By the time George and Adele followed, men and women stood silently in the rooms and halls. Punitive looked ridiculously small crouched in a corner, his head back, the rifle between his knees with the barrel in his shattered mouth. The total number of gray-uniformed bodies was six, all but Punitive killed by the Americans.

But the trainees began to file from the building and run back toward their rooms, for the body in the large room filled with complex electrical equipment was lying in front of a high-powered sending set—a radio whose tubes still glowed red.

George looked at the radio, then at Adele. "They sent for help," he whispered. "Soon, every American here will be dead. And it's because of us."

She didn't answer, and he expected no answer. The room grew dark as they stood looking at the humming set. Then he fumbled over the dials, switched the current off, and led her out into the street.

There was no whistle for the evening meal. The streets were empty, and the silence hemmed them in like a solid wall. They walked toward the men's feeding hall.

Passing through the hall, they entered the door leading to the kitchen. There were huge electric stoves and further on, wheat and sugar sacks piled ceiling high. In a large bin they found various canned goods—the Conquerors' personal food supply. The stoves worked, and Adele found an opener and pots in the glare of the unshaded light bulbs. They ate quickly; soup, meat, several cans of condensed milk. Then they left the basement and walked into the balmy evening air.

ON THE grassy spot in front of the Administration Building they loved each other desperately. Afterwards, they spoke of God, of what they believed would come after death, and were comforted. But they did not talk of what would happen to the others—that was too painful for words.

Before he fell asleep, with Adele breathing regularly beside him, he

once again strained his ears to hear something—anything—from outside the wall. Except for the ever-present hum of the oil-fed electric generators in the Administration Building, there was nothing. Not the bark of a dog or the scream of a cat or the clash of inanimate objects. Even the wind was dead. But he was too exhausted for fear, and slipped quickly into sleep. Once during the night, he awoke and raised his head to listen. When he lay back, there was a thought in his mind both terrible and full of hope.

Adele awakened him in the morning. From the sun he could tell that it was past the time for the first meal. They went to the feeding hall and ate; then returned to the grassy spot. This time they found little to speak of and sat silently, watching the gate. They watched until the sun dipped low and shadows engulfed the silent buildings. Then they saw the first trainees slipping toward the feeding hall; the women moving toward the men's section in the need for comfort and protection.

When George and Adele arrived in the kitchen, all the Americans were there. The women cooked the meal and whispered among themselves. The men sat talking, following the women with their eyes, trying to forget despair and certain death.

They finished eating and sat quietly at the tables, husbands reunited with wives, boys and girls whispering to each other, all unwilling to return to the rooms, George spoke his thoughts.

It was hard to speak aloud; he had kept his thoughts to himself for so very long, but he managed to speak quietly and calmly. He reminded them of the tactics the aliens had used to ensure obedience, how they had held out the promise of freedom as a reward for conformity. How, backed by the fear and terror they were able to inspire with their drastic punishments, they were able to enslave all the Americans and keep them toeing the mark. How they had probably felt secure enough in their conquest of the minds and bodies of their captives to leave the Earth in the hands of a few Punitives and a host of electronic gadgets. He told them, too, that the fact that no help had arrived despite the radio messages held the promise that the conquerors had no interest in Earth any longer; he assumed that they were busy elsewhere, or had merely conquered for the sheer joy of it, or that they lost interest . . . any reason would suffice. The important thing was that they they were free again. Free to live and laugh, to love and to hope . . . and to prepare a defense should the need arise.

When he finished, even Adele looked at him with disbelief. But they all followed him to the Administration Building and one of the young men seated himself at the radio. Filling the room and overflowing into the hall, they waited. The youth knew his radios and manipulated the dials skillfully, but there was nothing except the crackle of static. With dread and hope mingled together, George

listened to the empty airwaves—to the messages sent out on the sending set, and again to the barren, static response. Then he turned to Adele and smiled weakly. "We've more than Noah had," he said, and held her trembling hand.

It was not until two days passed and the fuel for the generators had been exhausted that the first search party ventured into the city. The report was one word ringing hollowly in the feeding hall. "Nothing."

Later expeditions utilized automobiles from the city's streets and traveled far out to other states. They returned with several haggard Americans and reports of some few surviving Conquerors. They also told of farms heavy with crops and of livestock wandering wild. But there were no large human groups; no signs of organized humanity anywhere in the world.

Two months after George and Adele Lowery's revolt, the trainees left the housing area for the fields where they could raise food and plan their civilization. George rode beside his wife in the lead car. There was no joy or laughter in them, nor would there be for many years. But the wrecked city fell behind, the green and brown of the fields took its place, and somewhere in the motorcade a voice began singing. • • •

WATERSHED (Continued from page 43)

and looked speculatively at Gorbel and at Lt. Averdor, who was staring at him with an expression of rigid fury.

"Or can you?" he said. "It will be interesting to see how you manage to comport yourselves as a minority. I think you lack practice."

He went out. Both Gorbel and Averdor turned jerkily to the screen, and Gorbel turned it on. The image grew, steadied, settled down.

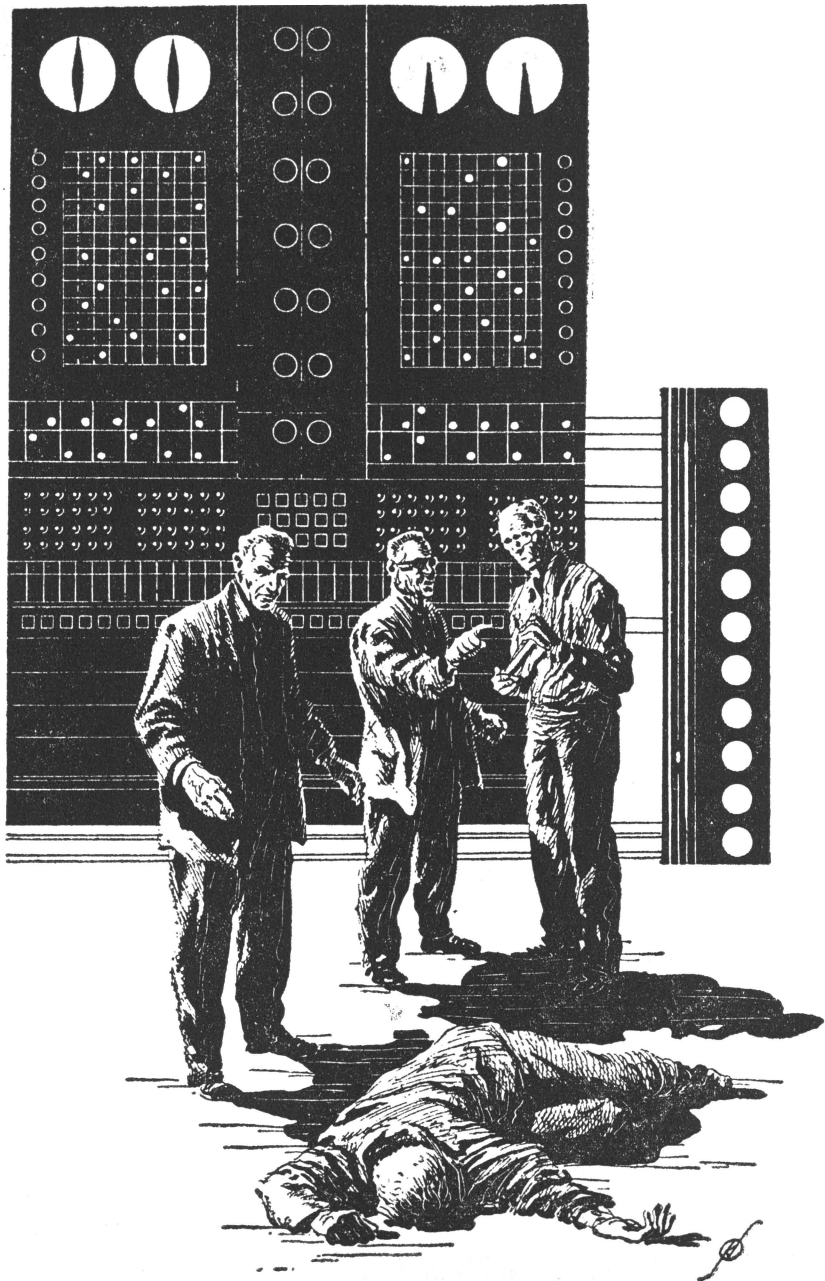
When the next trick came on duty, both men were still staring at the vast and tumbled desert of the Earth. • • •

EASY DOES IT (Continued from page 59)

"Yes," her husband mused. "The physician told me that right after we decided Hal was dead. I was going to mention it to you, but it slipped my mind somehow."

"Well, you're just a tiny bit forgetful at times, dear." Mrs. Webber sighed softly and turned to her son. "Hal, dear, it's awfully nice to see you back again. Would you be kind enough to switch the vic back on?"

Contentedly, Hal complied, and was himself immediately carried away by the vicarious entertainment, pleased to put the disturbing dream of the past three months comfortably behind him. • • •



Edith was just a computer, but a very good one and a very observing one. So it was quite natural that she be consulted about the doctor's murder . . .

WITNESS

BY GEORGE H. SMITH

Illustrated by Kelly Freas

BALLARD was quite dead. There could be no doubt of it. He lay sprawled in front of Edith, with his head very messily bashed in and with one hand still extended toward her. A long shimmering stream of blood ran halfway across the large room. Dr. Dudley Ballard had been as inconsiderate in his dying as he had been in his living.

Art MacKinney and I stood in the doorway and stared. We were shocked not so much by the fact that Ballard was dead as by the fact that he lay in this most secret room, this holy of holies. Ours was the most security conscious project in the whole country; and this was where he had picked to get himself killed.

"God! There'll really be a stink about this," MacKinney breathed.

"Well, I can't think of anyone who had it coming more than he did," I said. I hated Ballard's guts and everyone knew it, so there was no point in being hypocritical now.

Edith stood silently. She didn't seem to be interested in the fact

that the man who had run her life, who had spent hours shouting questions at her and criticizing her slightest error with burning sarcasm was now dead. No, Edith wasn't interested, but you couldn't really expect her to be—she was only a computing machine, a mechanical brain, the final result of years of work by the best cybernetics experts in the world. Edith was silent, and would be, until we turned her on and fed the tapes into her.

"It looks as though this is what did it," MacKinney said, indicating a large spanner lying on the floor beside Ballard. He touched it gingerly with his foot. His face was white and strained and it occurred to me that he was more upset than I thought he should be. After all, he had as much reason to hate the dead man as the rest of us. Ballard had taken advantage of his position as head of the research project to make passes at Jane Currey and MacKinney wasn't at all a cool scientist when it came to Jane. He was engaged to her and quite naturally resented Ballard's attentions to her.

"You'd better not touch that until the police get here," I said as he bent over to pick up the spanner.

"Yeah, I guess you're right—I forgot. How do you suppose this got in here anyway?"

"One of the workmen making adjustments on Edith's outer casing must have left it. I saw it sitting up there on top of her late yesterday afternoon," I told him. "You'd better go call Mr. Thompson and—the FBI."

With Ballard gone, I was in charge. Maybe someone would think that was reason enough for me to kill him. I didn't care, I was just glad he was gone. Now he couldn't mistreat Edith anymore.

I turned Edith on just as MacKinney returned. "What are you doing?" he asked.

"Why I'm going to wake Edith up and feed these tapes into her. After all these are more important than any one man's life."

"You didn't care much for Ballard, did you Bill?"

I gave him look for look as I replied. "Can you name anyone around here that did?"

He shook his head. "No—I guess not. But maybe it wasn't one of us. It might have been an outside job, you know. Edith was working on that space station stuff and the iron curtain people would give a lot to know about it."

"Hell," I said pressing the studs and levers that would arouse Edith and put her to work. "You don't really think anyone could get past those security guards, do you?"

Happily I went about the business of waking Edith, my sleeping beauty, from her slumbers. In a very few seconds, her hundreds of tiny red eyes were gleaming with intelligence.

Good morning, Edith I punched out the tape and fed it into her.

There was the faintest pause, while Edith's photo-electric cells surveyed the room, pausing for a moment on the sprawled body of Ballard.

Good morning, Bill Green, she typed back. I knew she was happy

to see me by the cheerful little clicks she emitted.

I have some interesting work for you this morning, Edith. And I think you'll be glad to know that we will be working together from now on instead of . . .

"Hey! What's the idea of starting that machine?" a gray haired, gray suited security agent demanded, striding into the room with MacKinney, Mr. Thompson and several other officers at his heels. "Don't you know enough not to touch anything in here?"

"This work is too important to be stopped—even for a murder," I said, and Mr. Thompson nodded in agreement.

"That's right," he said mopping his perpetually perspiring forehead, "this work has top priority from Washington." He looked nervous and I couldn't help wondering what he was thinking. There had been stories circulating about Ballard and Thompson's wife and the dome-headed little man must have heard them too. Ballard just couldn't keep his hands off any female within reach. That was one of the reasons he was so thoroughly hated.

The youngest of the security agents rose from where he had been kneeling beside Ballard and crossed to me.

"You're Green, aren't you?" I nodded and he continued, "How did you know it was murder?"

I laughed at him. "How the hell could a man bash in his own brains that way?"

The gray haired man stepped into the breach. He gave us all a thorough going over, but concentrated on MacKinney and me. He seemed to think it peculiar that neither of us could give any reason for Ballard's being alone with Edith. I was sure I knew, but no one would have believed me so I made no attempt to enlighten him.

"Well, I guess that's all we can do now," he said at last. "Someone from the local police will have to be notified and brought in after they get security clearance." He turned to go.

"Wait a minute," MacKinney said, "we're all overlooking one thing."

"What's that?"

"There was an eye witness to this crime," he said, and I stared at him in consternation. I didn't know he knew. I thought I was the only one who knew.

"What do you mean," the agent demanded angrily.

"Edith saw it. Edith, the computer."

"Are you nuts?" the agent demanded.

"You forget that Edith was turned off," Thompson said.

"But Mr. Thompson, Edith's not like most cybernetic machines. She's so far advanced, that I'm not sure we understand her completely. She can't really be turned off. She has a distinct personality and that new circuit—"

Of course Edith had a personality of her own! She had more charm, more intelligence, more understanding than most women.

"—well—she'd be able to tell us who killed Ballard."

"That's ridiculous," I said, badly

frightened. "A machine can't be a witness to murder."

The security officer looked dubious and shook his head. "I guess we'll have to leave that up to the coroner at the inquest."

"But they can't ask questions like that of Edith," I protested. "She's —she's too important to the national defense to have some country coroner asking her silly questions about the murder of a man who deserved to die anyway." I had to prevent this. I had to get around this eye witness business.

Thompson looked at me levelly. "MacKinney may be right, Green. The coroner may very well want to talk to Edith and there's no reason we should object if Security gives him clearance."

"But Mr. Thompson, our work —it'll be interrupted."

"We'll have to take that chance. And I think Washington will agree."

"But—" Couldn't they see that there wasn't any question of spying here. Couldn't they understand that Ballard had just gotten what he had coming. I couldn't let them question Edith. At least not until I had a chance to talk to her alone.

"And Green—because of your rather strange behaviour, I'm afraid I'll have to ask you to stay in your quarters until the inquest. MacKinney will handle your work with Edith until then."

I was shocked and really frightened now. I wouldn't get to talk to her, wouldn't get a chance to tell her what to say. I protested, but Thompson was firm, so firm that he placed a guard outside my door to make sure I didn't leave.

Washington rushed through clearance for the local officers and the inquest was held three days later. The coroner proved to be a shrewd country doctor, who had the inquest adjourned to the computer room as soon as he heard MacKinney's ideas about Edith.

The security guards on duty the night of the murder testified that only MacKinney, Thompson, Ballard and I had had access to the computer room; and it had already been established that it would have been impossible for a spy or foreign agent to have slipped into the heavily guarded room. It was clearly an inside job.

With all of us at the scene of the crime, the coroner summed it up for us. "—and since it could not have been the work of an outsider, it must have been a crime of a private nature." He looked closely at Thompson, MacKinney and me. "A crime of a private nature with the motive either revenge, jealousy or ambition. We know that the victim was an over-bearing man with a good many unpleasant traits. We know he was a man who forced his attentions on women, who was ill-tempered and abusive to those who worked with him. A man who had many enemies—but there were only three people who had the chance to attack him on this particular night.

"I am going to attempt to establish the identity of the killer by the unusual procedure of questioning a machine. It will be for later courts to establish the validity of such testimony. Because of the na-

ture of this case and because of the urgent need to get this computer back to its proper work, I am going to ask the questions in a more direct manner than I would ordinarily employ."

MacKinney took his place before Edith. They didn't even trust me to feed the tapes into her under their very eyes.

"Mr. Thompson, I object to the use of this delicate piece of equipment in—"

They ignored me, and MacKinney punched out the questions the coroner asked:

"Do you know who murdered Dr. Ballard?"

There was a pause. Edith blinked several times. I was shaking with apprehension for her. A mind so delicate and noble should not be faced with such a dilemma.

Yes, she typed back.

"Did you witness the murder?"

There was a longer pause this time. "You must answer the question," MacKinney reminded her.

I was here.

"Is it true that you do not lose your perceptive qualities when we turn you off?" MacKinney asked this on his own.

It is true.

"We might as well get to the heart of the matter," the coroner said. "Did Mr. Thompson kill Ballard?"

Edith clicked and her eyes glowed. *No.*

"Did Mr. MacKinney kill Ballard?"

No.

Edith had to tell the truth . . . it was an innate part of her personality. I tensed in my seat. I wanted to scream, to leap at MacKinney and prevent, somehow, the asking of the next question. But there wasn't a chance.

"Did Mr. Green kill Dr. Ballard?"

Edith's beautiful electric eyes flashed and her clicks pulsed twice as rapidly as before. There was such a roaring and wrenching within her I was afraid for her—she was being torn apart in her struggle not to answer. I couldn't stand listening to her desperate efforts any longer.

"Yes!" I leapt to my feet. "Yes, I did it. Leave her alone. Can't you see what you're doing to her? That swine was always mistreating her. He didn't understand her—no one understands her as I do!"

The coroner looked at me closely. "Is that really why you killed him, Mr. Green?"

"No! You were wondering why he was here by himself while no work was going on. He—he had begun to feel about Edith as he did about all women. He sneaked back here to be alone with her. He wanted to—he wanted to—" My voice broke and they stared at me in shocked amazement.

Into the silence MacKinney read what Edith had slowly typed out: "Mr. Green did not kill Dr. Ballard."

"Yes—yes I did," I screamed. "Don't Edith—"

"Who did kill him?" the coroner asked, quietly.

This was the question I had wanted to avoid. I sank down my hands cradling my aching head.

Edith must have expected the question. She had her answer ready.

I refuse to state on the grounds that it may tend to incriminate me.

My poor, sweet, adorable Edith. If only I had had a chance to talk to her, to tell her what to say. I had known . . . ever since I had seen the spanner and remembered where it had been before. I could have warned her to say that Ballard had attacked her, threatened her, to say anything . . . but not to attempt to hide behind a Fifth Amendment that didn't exist anymore. My darling, never had kept up with current events.

Now they'll disconnect her, they'll rewire her, they'll destroy her understanding, her warmth, her whole personality . . . and I . . . I love her, I love her . . . • • •

What Is Your Science I. Q.?

HERE'S A QUIZ that will test your knowledge of chemistry, physics and other items you run across in science fiction. How well do you know them? Counting ten for each correct answer, you should score 70. Anything over 90 and you're a whizz. See page 120 for the answers.

1. An Angstrom unit is equal to__________ of a millimeter.
2. What is Newton's third law of motion?
3. One "atmosphere" is equal to about __________ pounds per square inch.
4. How many degrees of temperature must to added to change centigrade to the Kelvin scale?
5. The speed of sound through water is about __________ times greater than it is through the air.
6. What is the highest audible sound frequency in most instances.
7. The smaller the density of a gas the __________ the velocity of its diffusion.
8. What is the name of the law of physics which states that strain is proportional to stress?
9. Radio and light waves travel at the same speed; but the frequency of radio waves is much __________.
10. How many foot pounds of work are equal to one B.T.U.?
11. Heat is transmitted by convection, conduction and __________.
12. What is the weight in pounds of one cubic foot of water?

FIRTH'S WORLD

His world was Utopia inhabited only by wealthy, brilliant, creative, ambitious people; it was the ultimate in freedom, exempt from taxes, social problems, petty responsibilities . . .

BY IRVING COX, JR.

LET HIM go. It's quite safe to leave us. I want to talk to him. Sit over there, Chris, where you can be comfortable.

A paradox, isn't it? You were taught we may never go back. Now I've authorized the building of the rocket. From your point of view you were justified in trying to destroy it. I'm violating the regulations; you weren't. But time changes the shape of the truth, Chris; it isn't static. No one had the insight, then, to grasp the insanity of John Firth's dream. People hated Firth or envied him; but no one called him mad.

John Firth was an industrialist; yet far more than that, too—politician, scientist, financier, even an artist of sorts. There was nothing he couldn't do; and few things he didn't do superbly well. That accounts for his philosophy. He never understood his own superiority. He honestly believed that all men could achieve what he had, if they set their minds to it.

"Lazy, incompetent fools!" he would say. "The world's full of them. And they've elected a government of fools, taxing me to support the others."

As billionaires go, John Firth was very young. Six months after World Government became an established reality, Earth ships began to explore the skies; and in less than a year Mars, Venus and the Earth had formed a planetary confederacy.

A new feeling came to men when the burden of war-fear was lifted from their minds. Men were free—free for the first time in centuries. Their full energies were channeled into invention, exploration, experiment. The Earth was like a frontier town: booming, uproarious, lusty, dynamic—but with a social conscience: poverty and deprivation for none and unlimited opportunity for all. For Man—that abstract symbol of mass humanity—it was the best of all possible worlds. Yet there were misfits; John Firth was one of them.

"We're coddling people," he said. "We're teaching them to live on charity, on government hand-outs—and I'm expected to pay for it all. Cut them loose; let them sink or swim for themselves. If some of them don't survive—well, they won't; that's all. We'd be a stronger people if we could rid ourselves of the leeches."

He was a man of the new age,—stubbornly holding to ideas from the old.

And then the Stranger came to see him. We don't know who the Stranger was or where he came from. A force of evil, perhaps—the symbol of Satan refurbished and streamlined to fit the concepts of the modern world.

"I've been reading your political pamphlets, Mr. Firth," the Stranger said. "You hold rather—rather fascinating views."

"Now that I'm suitably flattered," Firth answered, "may I ask what particular form of hand-out you want?"

"None. I've something for sale." The Stranger took a pamphlet out of his pocket. "But tell me this, first: do you honestly believe what you've written here?"

"Every word of it. If I could find my sort of world anywhere in the universe, I'd pull up stakes in a minute and—"

"You can create your own world, Mr. Firth."

"Do you suppose I haven't tried? In every election I back my candidates with all I have—prestige, propaganda, money. It does no good. The fools prefer to be governed by other fools, like themselves."

"I didn't mean here, Mr. Firth." The Stranger smiled as he lit a cigarette. "You see, my friend, I have a world for sale—a brand new world."

"One of the asteroids?" Firth laughed bitterly. "I could have done that years ago. They're too close to the commercial orbits. How long would it be before one of our ships found the place? Then I'd be right back in the system again—and a laughing stock as well."

"This is a planetoid beyond Pluto. It'll be generations before any of our ships—"

"A frozen world? No thanks!"

"Only on the surface. It's a hollow sphere, with a granite crust half a mile thick. Inside there's a suggestion of passageways and caverns, which may have been made artificially. Perhaps this was an outpost of a race which lived and died billions of years before our time."

"An archeological gold mine!"

"But Science pays so little, Mr. Firth. I'm interested in cash, not

prestige."

"Why should I pay you anything? You've told me where it is and what it is. I can find it for myself."

The Stranger laughed. "I said beyond Pluto; that covers a lot of space, Mr. Firth." He paused for a moment. "My price is the stock in your Martian mines. Convert the rest of your holdings into any form of wealth that seems convenient and usable. In your case, Mr. Firth, you *can* take it with you—to your own world. Think of it! No taxes; no social problems; no unfortunate masses to prey on your conscience; no government but your own."

That was the beginning of the dream. The seed of the idea grew in John Firth's mind until it overshadowed everything else. It became an obsession, driving him so that he had no peace.

DURING the course of a year Firth and the Stranger imported and installed the machinery to make the sphere livable: hydroponic tanks, air machines, gravitators, electric generators and an Atomic Power Core. In the crust of the planetoid they found enough fissionable material to keep Firth's world running for an eternity. They laid out the decorative landscaping, planned the living quarters, the laboratories, the amusement hall and the university.

It is interesting to speculate how much the Stranger contributed to the scheme; and it is an ironic speculation, for as soon as the larger idea took shape in Firth's mind, his only logical course was to murder the Stranger.

Firth could allow no outsider to know of the planetoid. To him it had become far more than a means of personal escape. It was to be an archive for the survival of John Firth's ideas, for the survival of civilization itself. John Firth believed that sincerely.

Firth's world—that magnificent dream which was like a holy crusade—was founded on murder, deception and greed. The reasoning of fanaticism engenders its own kind of ruthlessness. As soon as John Firth had disposed of the Stranger, he began to select his colonists. Men who by his definition, were not fools. He had to make his choice very carefully. If he misjudged his candidate and his proposition was rejected, Firth had given away his secret. Any man who refused him had to die. Murder was Firth's only guarantee of silence.

But he made few mistakes. John Firth was a good judge of men—his kind of men. All of them were wealthy, ambitious, brilliant. Nearly three hundred men and women were recruited.

They came here to escape; the record tells us that until we gag over the repetition. But to escape what? Taxes they resented unanimously, and restrictions on their freedom. They placed a value on the ownership of property that we can no longer understand. But, if you read the record closely, all that becomes superfluous. The thing they wanted to escape was responsibility. Responsibility to their fellow men.

Physically, Firth's world was a

paradise. It still is. Yet the dissolution began before the last colonist had arrived. Here they had assembled their wealth—in terms of machines, comforts, books, art treasures, amusements, laboratory equipment. They were entirely free from the burden of taxation. But, somehow, their wealth lost its meaning.

They claimed they had not withdrawn from the world in order to hibernate and decay among their luxuries. They wanted freedom in order to create, to invent, to experiment as they pleased. And they had that in Firth's world: a maximum opportunity for the development of individual initiative. For a short time they turned out a wonderful assortment of new gadgets and new machines, but slowly their industry ground to a stop.

If they had faced the truth then —but they were far too human to admit the failure of the dream. Instead, they found a scapegoat. John Firth has left us a record of a conversation he had with Adam Boetz; it is typical of their thinking at the time.

Boetz, as you may know, was one of the outstanding physicists of his day; he had created and built Atomic Cores, Incorporated, until it was the largest power company in the Confederation.

John Firth met Boetz one morning on the golf course in the recreation cavern.

"Adam!" Firth cried, with his usual, boisterous good-humor. "I never thought I'd find you out here at this time of day."

"Why not?" The physicist shrugged. "I'm tired, Firth. I had to do my four hour shift in the light plant last night. Maybe I'll feel like working in the lab tomorrow—and maybe not. I'm scheduled for a shift in hydroponics then."

"The shifts are short, Adam, and —"

"Still too long for me. I'm not used to so much physical labor." The physicist's lips curled in a sneer. "So very democratic, isn't it, Firth? Back home I hired men to do that kind of work for me."

Firth clapped him heartily on the back. "But we have other compensations, Adam. Four hours out of twenty-four is a small price to pay for freedom."

"Twenty-eight hours a week. Remember the new labor law the Earth government put into effect before we left? It proscribed a maximum work week of twenty-five hours for every man. We came here to escape restrictions, but we've saddled ourselves with more hours of manual labor than the least skilled laborer has to do on Earth. Firth! I'm not a manual laborer; neither is anyone else you've brought here."

"Do you want to go back?"

"What answer can I make to that? We're executives, Firth; but here we're a brain without a body. We can formulate the orders, but we've neither arms nor legs to carry them out."

"In other words, you're saying we should import a labor force to do our basic work for us?"

"Why not?"

"They're the fools, Adam, the incompetents! On Earth they were the millstones around our necks—

envying us, hating us, building a prison for us with their laws and their regulations."

"All very true, Adam, where the government is in their hands. But we could keep them under control."

After that John Firth heard the same complaint from the others, over and over. They said they could not take advantage of their freedom because of the chores they had to do to keep Firth's world functioning.

Firth called a meeting of the colonists. It was the closest approximation to a government they had; government itself was one of the things they wanted to escape. They unanimously agreed that a labor force had to be recruited, and they settled upon one hundred and fifty as the necessary number, half of them to be women. Working eight hours a day, such a force could perform the work of Firth's world, yet the colonists would outnumber them two-to-one and the labor force would not be large enough to constitute a threat.

"We'll insist that they marry, of course," Adam Boetz said, "and each couple will provide us with two children, so that we shall always have a stabilized labor supply."

"We're talking," one of the women whispered, "as if we were buying cattle!"

"We are."

"But how can you recruit men and women under these conditions? What inducement can you possibly offer them?"

Firth smiled. "When we find the people who meet our specifications, they'll come; don't worry. In the days of the sailing ships the technique was called shanghaiing."

"What specifications, Mr. Firth?"

"They must be young, strong, healthy, single—"

"And low-level morons," Adam Boetz cut in. "Imbeciles won't give us any trouble later on."

To his other crimes, John Firth then added kidnapping; the end justified the means. He was creating a world and that world would save civilization. I doubt that his conscience ever troubled him.

WITHIN two years the second group of colonists was established in Firth's world. Apparently they made an easy adjustment to their new environment. We have no record of complaints or protests. They were docile, obedient people. They took orders well; they liked to be told what to do; they needed very little supervision.

The first colonists were entirely free, then, of any sort of work-responsibility. For a while they went back to work in their laboratories or in the university—inventing, exploring, accumulating their store of knowledge. In imperceptible stages, however, their interest lagged, their production came to a halt again. This time they had no excuse, no scapegoat.

We can assume that some of them faced the truth squarely and honestly, yet they had chosen Firth's world and there was no way to turn back. We find only one actual hint of their despondency,

in a diary page written by an unknown woman.

Karl stayed home again today. He has nearly finished the design for his machine, but he has no more enthusiasm to complete it. I know how he feels; I can't go on with my painting, either. We have no purpose, no goal to achieve. We sit isolated in space, counting over the wealth of our talent and ability; but we can make no use of it. I wish I knew how many of the others think as I do, but I'm afraid to ask.

The key to understanding them, is that last sentence. Perhaps they all felt her disillusionment, but they had to pretend. Firth's world couldn't be at fault. If they were dissatisfied, it was because of a failure within themselves. At all costs, the flaw had to be hidden from their neighbors.

Their first labor trouble was a welcome interlude in the creeping boredom. The docile labor battalion suddenly discovered they were being overworked. Just what they could have done in Firth's world with shorter hours, no one knows. They staged a spotty, amateurish strike; speakers made reference to the labor laws applicable on the Earth and demanded better pay. To what end, it's hard for us to say. If the first colonists had turned over all their wealth, the workers would have had no more use for it.

John Firth was unusually alarmed by the threatened strike. He reacted with excessive violence and the other colonists followed his lead. Three of the leaders of the uprising were executed; others were brutally whipped. The Outlaw Pit was built then. Thereafter, at the first hint of any dissatisfaction, workers were condemned to it.

The violence taught the workers resentment. Silently, sullenly they passed on their hatred to their children. The aristocracy created the revolution, and nurtured it; for it would have made no real difference if they had surrendered entirely to the strikers' demands.

The children of the first colonists made no pretense of using Firth's world to advance knowledge, invention or art. They were hedonists, bred to luxury, supported by slaves.

The slaves, for their part, felt no emotion but hatred. From their parents they learned that the aristocracy had violated the labor law. The children knew nothing about the law or the distant Earth where it applied, but it was held in deep and sacred reverence.

The laboratories and the university stood empty; only the recreation cavern held any interest for the new aristocracy. A change took place among the slaves too. Their parents had been hand-picked morons. But neither brilliant achievement nor the moronic mind is hereditary. Most of the workers' children had an average intelligence; one or two would have been classified as geniuses. To their hatred the second generation joined intelligence, and Firth's world was ready to blow apart.

They struck the light plant first.

Sudden and unexpected violence surged through the dark, stone-walled corridors.

John Firth led a band of men against the enemy. But his attack failed and the workers seized the Atomic Power Core—the heart of our world. If they shut down the reactors, they would stifle not only our lights, but the gravitators and the air machines as well; they would kill us all.

The workers knew that. They were willing to risk suicide. Every bargaining counter was on their side. It was John Firth who surrendered.

Firth's world died then. In the bitter depths of the Pit, John Firth remembered what Adam Boetz had said to him so many years before,

"We've become a brain without a body. We can formulate the orders, but we've neither arms nor legs to carry them out.

Suddenly John Firth understood the fallacy of his fanaticism. A society was like a living body, an integrated organism of many members. No one could function without the others. No man—no group of men—could create an isolate world. The social equation seemed as clear to Firth as the simplest sum in arithmetic. Each man was a part of a functioning social unit which included them all. Each man's talent, whether it was the plodding docility of a moron or the brilliance of genius, belonged to all men.

In the meantime, the workers found that they could not run Firth's world alone, either. They gloried in forbidden luxuries until they were satiated. Shortly they became as indolent as the aristocracy had been; and the food supply was nearly exhausted.

The treaty they made was direct and to the point: the two groups agreed to live in equality, sharing the burden of the labor and the accumulated wealth of knowledge. The treaty was made when you were a child; we have perfected the technique of co-operation within one generation. We're ready, now, to go back to Earth.

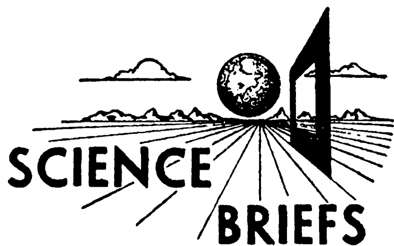
You'll be with us? Fine, Chris!

No. Please, no apologies. I understand why you intended to destroy our ship; others have attempted it, too. No harm was done. You're free,—entirely free . . .

. . . The Organizer waited until he was alone in the office. Then, with trembling, aging hands, he took the log book out of the safe and slowly made another entry:

> *Chris was the last, I think. He accepted the lie, just as most of the others have. When they return to Earth, they will be sound men with whole minds. For them Firth's world will always stand as a symbol of man's highest achievement in co-operation. May this sham, in some small way, expiate the crime and the folly of my arrogant delusion.*

John Firth's head dropped on his arm and his shoulders shook; but the sobs were sobs of relief. Chris was saved; Chris would go back. That mattered very much—for Chris was his grandson. • • •



If current experiments prove successful, pilots of the future may be talking with their ears as well as hearing through them. Based on the fact that the ear is a human two-way radio the researchers have succeeded in getting intelligible speech from the ears of several persons involved in the tests. They are quite certain that further studies and experiments will point the way to further improvement of the technique; and that in the future people will be able to be taught how to use the Eustachian tubes or the bones of the head as a sounding board for emitting speech as well as hearing it.

The daily round of the morning milk man may soon be a thing of the past. Researchers at Iowa State College have developed a frozen concentrated milk which the housewife may use in the same way she now uses frozen orange juice. The product is a whole milk product tasting exactly like regular bottled milk and with the same food values. A quart of the concentrate can be expanded to three quarts of regular milk by the addition of two quarts of water and stirring. Cans may be kept in the home refrigerator for two weeks without danger of spoilage and may be stored more than five months in freezer lockers at temperatures between 15 to 20 degrees below zero Fahrenheit.

The walls of your house of the future may be built of plastic foam which can be "foamed" into place rather than hammered or nailed, or laid by a stone mason. Researchers at the Dow Chemical corporation are toying with a device resembling a garbage can that would be a plastic "concrete" mixer. It would generate foam and force it through a hose to a workman. Using only rudimentary forms to contain the plastic until set, the workman would build the wall up quickly. Experts would then focus the radiation from high-voltage X-ray machines or radioactive cobalt 60 on the walls to raise its structural strength by cross-linking the plastic molecules.

Spare parts surgery of the future may soon include the grafting of plugs of living tissue into the human heart itself. Researchers believe that incompetent heart valves might better be repaired by using tissue from elsewhere in the body. In experiments they have used a plug of tissues consisting mainly of blood vessels. They pass this through the left auricle of the heart, through the mitral opening and into the left ventricle where it is finally anchored by stitching it to the wall of this heart chamber. There it functions as a substitute mitral valve between the two left

heart chambers. If the present tests prove successful, this new technique may soon be an accepted form of heart surgery.

Rocket fuel may be used as a coolant to prevent rocket planes of the future from melting at high speeds. When projectiles reach a speed five or six times the speed of sound, such intense heat is generated that aluminum and steel melt; and researchers are experimenting with the fuel as an answer to the problem. They agree that such research on thermal barrier problems has been lagging far behind the capabilities of aircraft engineers, and hope that this present research will solve the problem. The only alternative so far seems to accept the fact that planes will have to be partially rebuilt after each flight that lasts more than a few minutes.

Dehydrofreezing may be a word to conjure with in the not too distant tomorrow. It is a name given to a new process which combines the space-saving of dehydration with the advantages of freezing. Ordinary freezing tends to rupture the cellular structure of foods. Partial dehydration does much to overcome the objection and dehydrofrozen foods retain the right amount of moisture. They can be reconstituted simply by soaking them in water. Scientists report that the process costs somewhat more, but lower packaging, freezing, storage and distribution costs should result in an over-all saving to users.

Safety engineers predict that all automobiles will soon come equipped with safety belts similar to those used in airplanes. Several years of research have gone into the study of the perfect seat belt and several points have come up which will make for the maximum safety. The loop strength of the belt and buckle should be no less than 3,000 pounds, no less than two inches wide, only one person should use each belt, the belt must be anchored in a manner to transmit the full force of the belt's 3,000 pound strength to the frame of the car and the belt from attachment point to hips should cross the pelvic region at an angle of approximately 45 degrees. These minimum requirements have been strongly rec-

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CATALOGUES ISSUED

ommended as a means of substantially reducing the nation's huge traffic death and injury toll.

A new wrinkle in the cultivation of the oceans for food has been proposed by researchers. Scientists have noted that there is a band 500 miles on each side of the equator which is almost perpetually calm and where the sun shines almost every day with a steady temperature of 86 degrees Fahrenheit the year round. The development of extreme high-strength plastic films has made possible floating plastic stills, created under Department of Interior sponsorship, that convert salt water to fresh. Fresh water from these stills is used to cultivate plants floating in canoe-like plastic boats. One such floating garden is already in existence and flourishing mightily in the unusual surroundings.

Job seekers may one day have to submit to aptitude tests that include a checking of their brain metabolism. Scientists have discovered that they can predict the behavior of rats by checking the chemical activities of the brain. In running through a test maze the animals responded as visualists (they followed light and dark alleys) or spatialists (who run to the right or the left orientation of the alleys). When sample tissues were examined, the level of cholinesterase enzyme in the spatialist's brain areas was much higher than that of the visualists. Testing the enzyme activity beforehand gives an accurate prediction as to which of the categories the test animals will belong to.

The telescope and electronic computer have been combined to locate the lost planet Athalia. With the combination, Dr. Paul Herget, of the Cincinnati Observatory, rediscovered the minor planet which had been lost for fifty years. The planet, originally discovered photographically at the Heidelberg Observatory in Germany in 1903, was not photographed again until 1948, when Indiana University took about 2000 plates of minor planets. While checking the plates recently, Dr. Herget solved the problem of the orbit on a giant IBM computer. It took him exactly one minute to solve the problem which had plagued and teased astronomers for almost half a century.

WHAT IS YOUR SCIENCE I.Q.?

ANSWERS: 1—One ten-millionth. 2—Interaction. 3—15½. 4—273. 5—4.5. 6—20,000 vibrations. 7—Greater. 8—Hooke's Law. 9—Lower. 10—778. 11—Radiation. 12—62.4.

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- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Creative Salesmanship
- ☐ Federal Tax
- ☐ Letter-writing Improvement
- ☐ Managing Small Business
- ☐ Office Management
- ☐ Retail Business Management
- ☐ Sales Management
- ☐ Stenographic-Secretarial
- ☐ Traffic Management

CHEMISTRY
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Natural Gas Prod. & Trans.
- ☐ Petroleum Engineering
- ☐ Plastics
- ☐ Pulp and Paper Making

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Reading Struct. Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Mine Surveying and Mapping
- ☐ Ship Drafting
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrical Maintenance
- ☐ Electrician ☐ Contracting
- ☐ Lineman

HIGH SCHOOL
- ☐ Commercial
- ☐ Good English
- ☐ High School Subjects
- ☐ Mathematics

LEADERSHIP
- ☐ Foremanship
- ☐ Industrial Supervision
- ☐ Leadership and Organization
- ☐ Personnel-Labor Relations

MECHANICAL AND SHOP
- ☐ Gas—Electric Welding
- ☐ Heat Treatment ☐ Metallurgy
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Supervision
- ☐ Machine Design-Drafting
- ☐ Machine Shop Inspection
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration
- ☐ Sheet Metal Worker
- ☐ Tool Design ☐ Toolmaking

RADIO, TELEVISION
- ☐ Electronics
- ☐ Practical Radio—TV Eng'r'ng
- ☐ Radio and TV Servicing
- ☐ Radio Operating
- ☐ Television—Technician

RAILROAD
- ☐ Air Brakes ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Section Foreman

STEAM AND DIESEL POWER
- ☐ Combustion Engineering
- ☐ Diesel—Elec. ☐ Diesel Eng's
- ☐ Electric Light and Power
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Finishing and Dyeing
- ☐ Loom Fixing
- ☐ Textile Designing
- ☐ Textile Eng'r'g ☐ Throwing
- ☐ Warping and Weaving

MISCELLANEOUS
- ☐ Domestic Refrigeration
- ☐ Marine Engineering
- ☐ Ocean Navigation
- ☐ Shipfitting
- ☐ Short Story Writing
- ☐ Telephony

Name________ Age____ Home Address________

City________ Zone____ State________ Working Hours____ A.M. to P.M.____

Occupation________

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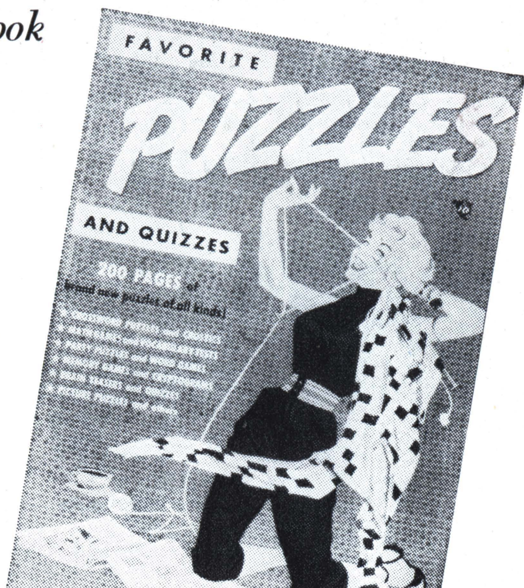

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