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SCIENCE-FICTION

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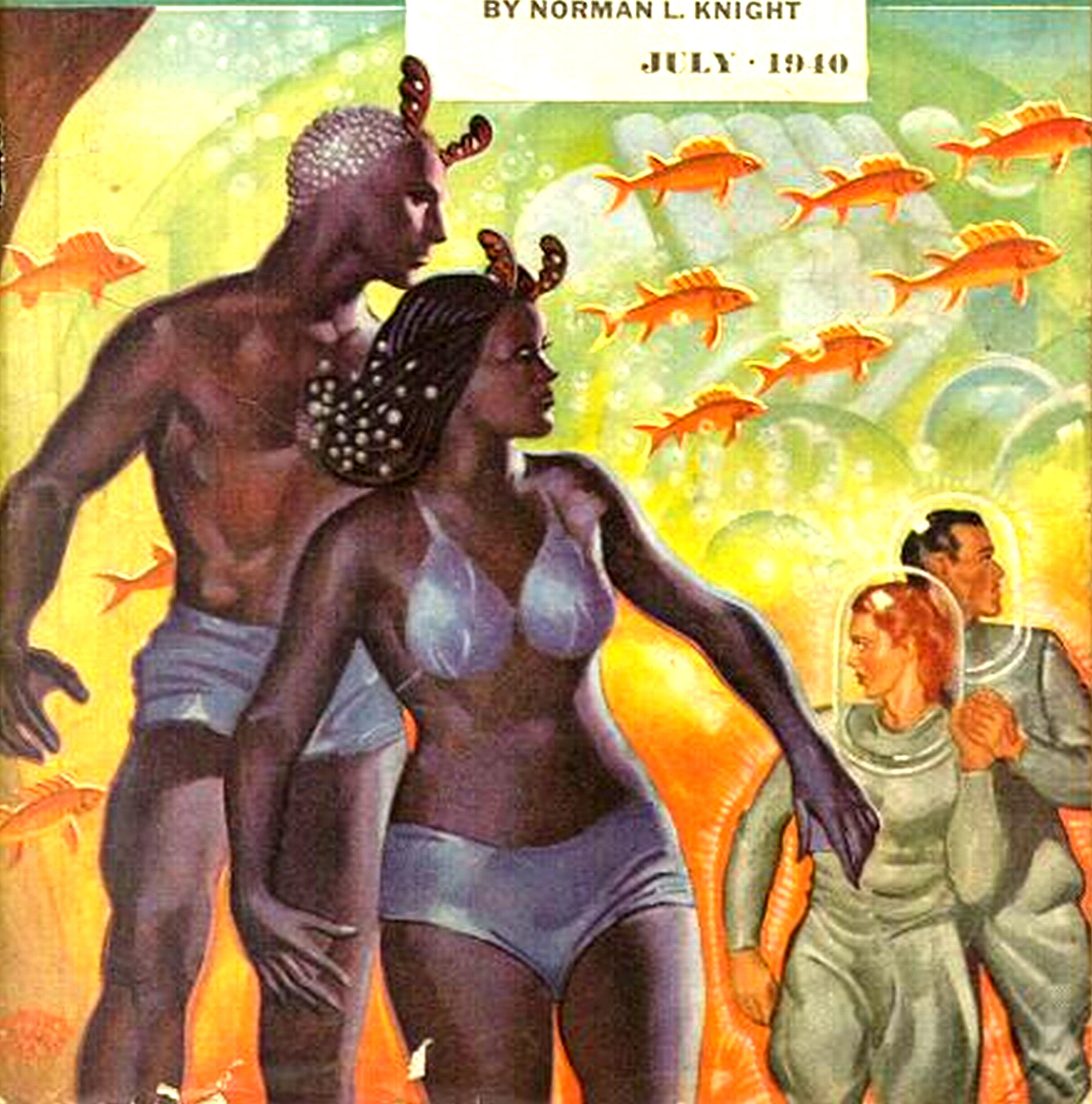
CRISIS in UTOPIA

BY NORMAN L. KNIGHT

JULY · 1940



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COVER BY ROGERS

All stories in this magazine are fiction. No actual persons are designated either by name or character. Any similarity is coincidental.

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ATOMIC POWER TO SPACE

For some while, I've felt that space flight not only would have to wait for atomic power, but already had waited for it. It begins to look as though atomic power is in the stage of waiting for developed theory to be turned into engineering practice. How does it effect the status of space flight?

First, the necessary assumption on which we can base a provisional discussion: Assume that U-235 has been isolated in large quantities. (It will be—you can bet on that!) Assume that it works as physicists now believe it will, releasing its energy when surrounded by neutron-slowing water jackets to produce heat and steam. Finally—and this is the long assumption—allow that a material is devised which is capable of stopping the gamma radiation inevitably accompanying the atomic fire, as light accompanies chemical fire.

U-235 contains as much energy per pound, so the papers say, as five million pounds of coal. That's less than half the story; the coal must be burned to CO_2, which is twleve parts carbon and thirty-two parts by weight of oxygen. That makes U-235 worth something like nineteen million pounds of oxygen-carbon fuel. That's power-per-pound enough to make the Moon and back a pretty darned simple proposition—Mars and back no serious strain on the fuel reserves. For ordinary chemical fuels have energy enough to just barely squeeze out a Moon-and-back trip with their power-per-pound ratio.

Why, from that, it looks like two weeks after Atomic Power Plant No. 1 goes on the lines, cigar-shaped things labeled "The Moon or Bust" will start sprouting all over the planet. If they do, they'll probably bust very profitably—financially. The salesman for U-235 bricks will probably replace the gold-brick dispenser of an earlier day. His second line of defense will probably be the phony interplanetary ship stock company.

Because the engine may have lots of power, but unless you can get a transmission gear to handle it, it's as useless as a steamer with a broken propeller shaft.

We have atomic power. Swell. How are you going to take hold of space with it, though? The chemical fuel rocket is burdened with a frightful amount of mass for each unit of energy—but that mass is at least handy for throwing out in the form of rocket exhaust for driving reaction. Atomic power has such a frightful concentration of energy per pound that there isn't *enough* mass!

Therefore, the energy released in the atomic engine must somehow be applied to ejecting mass in some fruitfully violent manner. The actual

form atomic energy as now known takes is no handier than a coal fire or a gas jet—plain, old-fashioned heat.

The U-235 atom explodes, ejecting from its shattering nucleus an assortment of atomic debris including barium, tellurium, iodine, a dozen other elements, all moving outward with all the violence and velocity anyone could ask. So much, in fact, that nothing could control and direct that velocity; it's purely random, in all directions. The explosion of U-235 is too violent to be directed by any type or form of rocket jet. Not even atoms can bounce in the usual elastic way when they smack into another atom with one-hundred-million-volt energies; hence the discharged particles cannot be used directly.

That means steam will have to be generated as an intermediate step, at any rate. Shall we use this steam jet, atomic-heated, as our rocket jet? Thrown for no gain on that one. We might as well use hydrogen-oxygen fuel in the first place. If we impart to the steam, by atomic-energy means, a higher jet velocity than the oxygen-hydrogen reaction could, we would, naturally, get more results per pound. But higher velocity means higher temperature—and the oxy-hydrogen jet is already hotter than we can conveniently handle. Then any real, appreciable gain by super-heating is promptly going to run up beyond anything our metals will stand.

And, furthermore, our U-235 reacts only with *slow* neutrons. If the steam is heated to any such temperatures as the above would suggest, neutrons in velocity-equilibrium with it won't be slow enough to react with the U-235 anyway!

It looks rather as though some intermediate stage is necessary. The whole thing is so completely shrouded in fog of undetermined things that no worth-while analysis is possible beyond this; direct application of atomic energy in present known forms seems highly improbable, but a major factor for space travel is now at hand. We have a fuel that makes the task possible; we lack means of applying that fuel.

A rough guess at something that may apply it; use hydrogen, broken down by an arc between tungsten electrodes, smash a beam of electrons in to ionize it, and eject hydrogen *ions*. A voltage of several thousand or hundred thousand could be generated by atomic-steam-turbines and used for accelerating the ions to velocities equivalent to hundreds of thousands of degrees centigrade. A second set of tubes ejecting electrons would be definitely desirable—otherwise you'd be trying to land a spaceship charged to a few hundred million volts potential when you reached a planet, due to loss of positive charges only!

But it might be done.

THE EDITOR.

No one ever noticed Bill,—until.....

LET MUSIC MAKE YOU POPULAR

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ONLY a few short months ago Bill was a back number socially. Then suddenly, Bill amazed all his friends. Almost overnight it seemed, he became the most popular man in his crowd.

The big chance in Bill's life began at Dot Webster's party—and quite by accident, too.

As the party got under way, Dot's face flushed.

"I'm sorry, folks, but Dave Gordon, our pianist, couldn't come. Isn't there someone here who can play?"

For a moment no one answered. Then suddenly Bill rose and strode to the piano. "Do you mind if I fill in?" he said. Everyone burst out laughing. But Bill pretended not to hear.

As he struck the first few chords, everyone leaned forward spellbound. For Bill was playing as Dave Gordon had never played, playing with the fire and soul of an inspired musician. In a moment Bill was the center of an admiring throng. In answer to their eager questions, he told them how he had always wanted to play, but never had the time or the money to realize his ambition. And then one day he read about the wonderful U. S. School of Music course, and how almost anyone could learn, at home, without a teacher, and at a fraction of the cost of ordinary old-fashioned methods. "That day," said Bill, "was a lucky day for me. I sent for the course, and when it arrived, I was amazed! The course was as much fun as a game, and in a few short months I had mastered some of the most popular pieces. There's no mystery about it. Learning to play is actually as easy as A B C, this 'Short-Cut' way."

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CRISIS IN UTOPIA

By Norman L. Knight

What would be the reaction of normal men to the knowledge that strange, sub-sea men were being designed—created artificially?

Illustrated by R. Isip

AN outline of the corporate structure and operating methods of Submarine Products Corporation would have amazed and baffled the economists and statesmen of an earlier age almost as much as the engineers

and biologists of those ruggedly individualistic times would have been bewildered by its technical achievements. If the conception of such an organization had, in a moment of wishful reverie, entered the antique meditations of any of those worthies he would have dismissed it from his mind as a Utopian fantasy. And, relative to the conditions and limitations of his era, he would have been undeniably correct. Although known as a "corporation," the term was a hoary etymological survival; it connoted an entity vastily different from the "corporations" of the perplexed and troublous twentieth century. It approximated more nearly in meaning to the term "government" as then used with reference to nations. But Submarine Products Corporation administered the affairs of neither a race nor a nation; its domain was the sea, from surface to nethermost deep, and all the resources which lie therein. It was untroubled by questions of national sovereignty or of territorial boundaries, since these things had long since dwindled to mere section headings in history texts or items of realism in historical novels.

This quasi-governmental, lucidly practical yet idealistic association was planetary in its scope. It absorbed the thought and effort of over ten million people drawn from a multitude of races. It interlocked with a galaxy of similar corporations which, in their aggregate, performed the multifarious work of the world. It was one organ in the world-embracing organism of terrestrial civilization.

This organism possessed a brain, officially designated as Prime Coordination Center but known familiarly as Prime Center. Prime Center exercised no arbitrary powers—had no need of such powers; it merely integrated a world which was rational and self-regulating to a degree beyond the hopes or dreams of the era of parliamentary government. It was the ultimate repository of facts and ideas, the universal forum of fundamental discussion and controversy, the incubator of vast projects, the fountainhead of information.

Information from Prime Center was disseminated through a network of subsidiary centers, among which was the Travel Bureau of Submarine Products Corporation, located on Andros Island in the Bahamas.

Our immediate interest now focuses upon the official sanctum of one Syrcamor, a travel counselor, whose domed consultation chamber was but one in a warren of similar chambers. Syrcamor sat before a console not unlike that of a pipe organ, in a curious high-backed, canopied chair of copper and steel sheathed in vitreous plastic. He scrutinized a printed tape which issued from a clicking mechanism on the console. A multiplex projector similar to that of a planetarium was suspended above the console from the center of the dome. At the moment the dome was a huge luminous map—one half of a concave terrestrial globe showing North America and portions of South America and the western Pacific Ocean. The arctic regions were behind the console; North America arched overhead.

The clicking mechanism ceased, the flow of tape halted, and Syrcamor touched a lever of the console. A musical hum followed, like the spinning of a giant top. Syrcamor's chair pulsed with a dim luminosity and he became enveloped in a tenuous bluish aura. At the same time a circular plate, set into the flat top

of the console, glowed bluely; it discharged a nebulous corona of light which took form and seeming solidity, became the reduced three-dimensional image—one foot in height—of a man seated in a chair which duplicated Syrcamor's. Syrcamor addressed the toylike apparition.

"Larkmead, two youngsters are coming in to see me about a Southern Pacific cruise. What's the latest regarding the ban on the Triton Reef area?"

"The ban, so far as I know, is still on," replied the image of Larkmead. "The Reef Council has been in session all morning, going over the latest reports, but they've made no announcement. They may release everything for immediate broadcasting or they may wait another year. Who knows? In the meantime, it will be advisable to discourage your clients—discreetly, of course—from going below thirty degrees south in that region, as in the past."

"That's all I want to know," declared Syrcamor. He touched the lever, and the image disappeared.

This form of communication was not radio. It was space-wave telephony, utilizing transverse oscillations of space itself which were perpendicular to all three dimensions. The waves passed through matter almost unimpeded. The stereophone beam permitted of straight-line transmission through the mass of the Earth. It supplemented but had not replaced radio broadcasting and wired telephony, and was a standard item of submarine equipment.

"Send them in," said Syrcamor, apparently addressing the console.

A WALL PANEL and a contiguous semicircular section of floor executed a half turn about a vertical axis. Two chairs of light metal were thereby rotated into the chamber, bringing with them a youth and a young girl. Both were clad in shorts and sleeveless tunics of overlapping silvery scales; they were shod with form-fitting knee-length boots of violet-blue synthetic leather, adorned only by the narrow glinting stripes of golden zippers.

Both were long-limbed and broad of shoulder. Some ancestral strain of tropic blood had endowed the youth with hair of unequivocal blackness—which he kept shorn close to the scalp—but prolonged exposures to the sun since early childhood had darkened his skin to the hue of terra cotta. Similar exposure in the girl's case had resulted only in a delicate pinkish-bronze tint, powdered over with an infinite number of minute freckles; even the backs of her fingers were freckled. Her hair glowed with the color of dully heated oxidized copper, and at the moment was confined in an elastic transparent sheath like a cap of glass.

Syrcamor consulted the printed tape.

"According to this information you are registered as SPC-17-NA-136-Z4075; chosen name, Raven," Syrcamor began, glancing at the youth, "and you are listed as SPC-2-CB-136-819; chosen name, Topaz." He nodded toward the girl.

"You have proposed a voyage among the reefs and islands of the southern Pacific in your submersible cruiser, the *Kelonia*, which has been inspected and found to be in seaworthy condition. Both of you are certified navigators."

"That's right," affirmed Raven.

It should be remarked that this conversation did not take place in the English language, although an ancient American from the year

2000 A. D.—or, in fact, almost anyone from that period—might have detected a haunting familiarity in certain words.

"Your vessel is specially equipped for submarine photographic work," Syrcamor continued, reading from the tape, "and you have cruised and photographed extensively in the Caribbean area. Both of you are nineteen years of age and have selected your adult work—the creation of ornamental design. Your advisers have approved the proposed journey. If you will tell me something more about yourselves, I can advise you more intelligently."

"We're gathering material for animated marine murals," began Raven. "Right now we're working on submarine seascapes of coral reefs. Of course, we pick up a lot of other data, whether we have immediate use for it or not. We're sure of finding a wealth of new ideas among the Pacific islands. Two years have been allowed us for this cruise. Also, it's part of the regular training—mingling with other people in their own lands, taking part in other ways of living—all that sort of thing."

"And I have a sort of incidental project of my own," declared Topaz. "I like to make pictures of whales. We don't know enough about them. All we have is general information, hardly anything about whales as individuals. I'd like to follow a particular herd continuously—for months—take close-ups—"

"Wouldn't that be inadvisable in a small craft like the *Kelonia?*" inquired Syrcamor.

"It would," agreed Raven. "One good blow from the flukes of a whale— It wouldn't wreck us, but —I'd rather run aground at full speed."

"Old cautious Raven!" scoffed Topaz. "He talks just like our work counselors. I've tried to have a big submersible built, shaped like a whale, but Prime Center says that there are so many other things to be done, more urgent things—"

"But you *have* decided that this cruise shall be primarily a quest for new ideas to use in your designing?" queried the counselor.

"Well, yes," conceded Topaz. "Whales are out—unless we run across them accidentally."

"Very well. Then let us begin," said Syrcamor, and touched the keys of the console.

THE MULTIPLEX projector whirred softly and the luminous map shifted on the dome. The arctic and all but the westerly rim of the Americas slid from view; the easterly portion of Australia and the margin of Antarctica appeared, and all the island constellations of Oceania. He touched other keys, and a web of colored lines appeared on the blue expanse of ocean.

"What are those lines?" asked Raven.

"Transport routes—air, surface, submarine," replied the counselor. "It isn't what I meant to show. It's my error. I'll change it."

He reached for another key.

"Wait! Don't take them away yet!" exclaimed Topaz. "Why do they all avoid that big vacant spot in the south Pacific?"

"The transport centers are so located that no route goes through that area. There's very little in it —no large islands, a few insignificant shoals—just a great, monotonous expanse of empty waters. One might call it a sort of oceanic desert. The depths are mostly two or three thousand fathoms. The bottom is cold, covered with red clay or ooze, devoid of light except for

phosphorescence, and inhabited by such creatures as one finds in any other of the great ocean deeps. The surface climate is predominantly cold and foggy. You wouldn't be interested in it."

Other keys clicked under Syrcamor's fingers, the transport routes vanished, and in their place appeared the contour curves of the ocean bottom together with two wavy red lines which spanned the sea north and south of the Equator.

"There you may see the shallows and atolls where one will find an infinitude of coralline scenery," remarked Syrcamor. "Also the two isotherms of average annual surface-water temperature of twenty degrees centigrade. You won't find any corals outside of that belt except the less spectacular species."

"We know all that," observed Topaz. "Where shall we go first?"

"Suppose we begin with the Galapagos Islands," suggested the counselor. He indicated the group with a threadlike beam of light from a tube in his hand. "Submarine Products has some magnificent fish hatcheries there. Have you ever gone into a hatchery pool? Have you ever walked through a school of ten million small fry on a day of bright sunshine? You will find it an unforgettable experience. Then you might go on to the Marquesas—"

"We could drop down to Easter Island and Pitcairn on the way," interjected Raven.

"A good suggestion," agreed Syrcamor.

"We might even go as far south as the antarctic drift ice!" exclaimed Topaz. "I'd like to get a squid's-eye view of some icebergs."

"Hold on! That's a cruise in itself!" objected Raven. "What are we going after? Corals or icebergs?"

"I am afraid that I, also, must disapprove of that idea," smiled Syrcamor. "Unpleasant things can happen very suddenly to small submersibles among the ice floes. You need a larger vessel and more companions for an antarctic trip. I strongly advise that you make Easter Island your 'farthest south' until you reach the vicinity of New Zealand."

"You're right, of course," Topaz reluctantly admitted. "So we start out this way: Galapagos, Easter, Pitcairn, Marquesas. Then what?"

II.

EVEN the veriest landlubber would have said that the *Kelonia* was not built for abnormal speed. She was sixty-five feet long and forty-three feet in the beam, and shaped like half an egg—sliced the long way—with the smaller end at the stern. The bottom was not flat, but slightly convex. The control cabin was housed within the elongated hump of the conning tower at the summit of her rounded hull. Sheathed and almost concealed within the nether part of that hull were a sturdy pair of caterpillar treads wherewith the craft might crawl on a reasonably smooth bottom or, on a favorable shore, beach herself. Popularly and with obvious appropriateness the *Kelonia* and all kindred vessels were known as turtle boats. An antiquarian versed in the gruesome chronicles of that long-defunct monstrosity, mechanized warfare, might have compared her to a seagoing tank.

The hull of the *Kelonia* was neither riveted nor welded, but had been sprayed on a refractory mold, to an accompaniment of flame and thunder, with a device known to technicians as a molecular accretion blast. It was a continuous, seam-

less shell wrought of alloyed monotopic aluminum and tantalum—that is to say, of the purified isotopes possessing maximum tensile strength and toughness. It could have withstood the assults of a dozen whales; Raven's concern over such an encounter was prompted by a consideration for certain more fragile internal fittings.

To understand the motive power of the *Kelonia* it must be borne in mind that she was a product of the so-called Age of the Space Warp. She was essentially a rocket craft in which the rockets were jets of water expelled by turbines, which in turn were field-geared to space-warp vortex motors. The heart of the vortex motor was a single cylindrical crystal of monotopic iron within which—to state the facts simply and therefore inaccurately—a very tight, helical space warp had been established. As the space distortion unwound, the cylinder of iron rotated with it. The true theory of this whirling cylinder—the vortex rotor—may be stated only in mathematical symbols. A jaded engineering student was credited with the remark that to construct a vortex rotor one obtains a bucketful of space-warp functions and screws them together.

When submerged, the *Kelonia* breathed like a fish. Her turbines sucked in water through intake grids in the bows, drew it through a plankton filter—which periodically ejected its accumulations—and thence to the aërophores—ingenious osmotic gadgets which were essentially artificial gills wrought of chrome-platinum and silicoid. From the aërophores the hurtling stream passed through the turbines and so to the propulsion jets.

In spite of her unwieldy shape—designed primarily to provide spacious living quarters—the *Kelonia* was surprisingly tractable when a skilled hand controlled her valves and diving planes. Both Raven and Topaz possessed that requisite skill, bred of long practice and a deep-rooted love of the sea and all pertaining thereto. Both had been born within sound of the surf; the rearing of both had been "sponsored" by Submarine Products Corporation. They spelled each other in the navigation of the *Kelonia*, and at the moment the craft was cruising with a comfortable depth of five fathoms over her conning tower and Topaz at the controls. Raven's dark poll appeared above the rim of the circular companionway in the control-cabin deck.

"Where are we now?" inquired Raven.

"Forty miles from Easter Island, six degrees north of west. I've laid the course for Pitcairn."

"How is it topside?"

"Rather jumpy. We'll make better time by staying down under."

Through the forward observation port Topaz looked out into a jade-green void, agitated by the million-shafted play of sunbeam javelins which waxed and waned with the passage of cloud shadows. The remoter distances were veiled as by successive curtains of diaphanous green gauze. The surface, seen from below, was an undulating ceiling of green-silvered glass from which depended occasional bristling chandeliers of floating algæ, twinned by their upward reflections.

"Let the rob take over for a while; then come below to the galley," Raven requested; the robot to which he referred was an automatic pilot in a chamber below deck. "I've steamed some kaffina, and besides I want to tell you something I've been thinking of."

The pungent, golden aroma of kaffina—the latter-day synthetic successor to coffee—rose around him through the companionway as he spoke.

IN THE COMPACT, immaculate galley of the *Kelonia* four telescreens set in the walls faithfully duplicated the view from the observation ports of the conning tower. The kaffina urn, plated with lunar gold, was Topaz's especial treasure.

"I thought of something that Syrcamor said, back there at the Travel Bureau," Raven announced after a long, appreciative draft of the steaming kaffina. "You remember—when he put on the transport routes by mistake and you asked about the big blank spot in the ocean. Well, why did he say, 'You wouldn't be interested in it'?"

A gong boomed urgently, the vessel tilted, the kaffina sloshed inside the urn. Raven glanced at the forward telescreen.

"Obstacle monitor spotted a shark and we started to dive under," he commented. "That's the only fault of the rob; it can't think. But as I was about to say: Why wouldn't we be interested? We're not closing our eyes to everything except coral reefs. Anything under the sea or on it is grist for our mill. He was a little too insistent on the emptiness of the ocean south of Easter Island. By the time we left, I felt as if the whole south Pacific, from there to the edge of the drift ice, were just one big swimming pool with a vitrolith bottom filled with sterile distilled water."

"I noticed that myself," agreed Topaz. "I felt that he was going out of his way to convince us that we didn't want to go any farther south."

"Imagine being a thousand miles from the nearest speck of an island," Raven went on. "Two or three miles of water under us. Nothing but sea and sky for several days' cruising in any direction. And it's merely nonsense to talk about 'empty waters' when just under the surface is a whole floating world of life. I move that we change our course and make—say, a seven-day run due south before we go on to Pitcairn. Probably we'd see some whales. But don't try to argue me into continuing on to the ice zone. Syrcamor was right about that."

Topaz burst into laughter. "All morning I've been thinking the same thing and wanting to ask you about it. Let's plot a new course now—south."

"Let's—but on one condition: no close-ups of whales," concluded Raven, with a final hasty gulp of kaffina.

By nightfall the *Kelonia* was plowing southward along the one hundred and tenth meridian (west), surface-cruising under robot control in what was close to a dead calm, with a glimmer of phosphorescence in her wake. An observer in the air, had there been one, would have seen nothing upon that dark waste of waters under the Southern Cross save the navigation lights of the submersible and their ripple-shattered reflections.

ON THE sixth night out from Easter Island, Raven awoke in his dark cabin from dreams of parched and burning deserts. He lay marveling at the realism of his dream; his throat was dry and he was outrageously thirsty. He still could feel the desert heat. Then he sat bolt upright. He *could* feel the desert heat. At least, the air in the cabin was like the air of an oven. He grasped the edge of his bunk—

The operator's voice broke through the snarl of sound. "We can't reach Triton Reef, sir. Something has happened—"

and touched hot metal! Sleep and amazement struggled in his brain like whirling vapors. He switched on the light, leaped into his trunks, ran barefooted from the cabin and collided with Topaz in the passage.

"What's going on in this ship?" demanded Topaz. "Did you turn up the thermostat? Surely you didn't expect to reach the drift-ice zone before morning—not in this tub."

"I don't know anything yet, except that I'm practically desiccated," answered Raven. "And there's a foul whiff of something in the air. Hydrogen sulphide! Come aloft to the tower."

"*Phew!* It's growing stronger," muttered Topaz as they scurried up the conning-tower companionway.

They rapidly examined the instrument panels.

"The thermostat's just as we left it," Raven announced. "The monitors haven't spotted anything since we turned in. Rotors and turbines are pumping right along. Aërophores shut off, the way I left them. We're breathing surface air. Ven-

tilator's all right. No trouble lights showing. This stench must be from outside. Hm-m-m. Barometer down—weather brewing. But the outside air temperature! Look at this! Fifty-one! No wonder we're baking! It's impossible!"

"If that's impossible, then what do you call this?" inquired Topaz, pointing at the water-temperature recorder. The instrument showed a steady climb to fifty-nine degrees Centigrade and was still slowly, inexorably rising.

III.

The two youngsters regarded each other in blank astonishment. Then Raven asked:

"What time is it?"

"A big help, that! Look at the clock. It's four fifteen in the morning, if you must know."

"I was wondering how far we had come. The log will show it, of course. My thoughts are slightly curdled. *Ugh!* Even the deck is hot! Let's turn on the bow floodlight and open the hatch."

The conning-tower hatch flew open with a *clang*, emitting a murky glow from the control cabin. The wonder-stricken faces of Raven and Topaz rose from the aperture. For a moment their minds did not register exactly what they saw. The *Kelonia* drove ahead smoothly as if on a sea of oil.

"Fog!" exclaimed Topaz, coughing. "No, it's steam! Steam and gas! The ocean's steaming!"

"It's almost thick enough to swim in," observed Raven, coughing also. "And the floodlight—a white blob. Your face is just a blurred spot. And the odor—"

"Hydrogen sulphide with a dash of sulphur dioxide and chlorine," finished Topaz, sniffing and wheezing. "Something else, too. A dead-fish odor. There must be tons of 'em afloat. There! Hear that bumping alongside?"

Raven's mental equilibrium was returning.

"We're right on top of a volcanic outbreak in the ocean bottom," he decided as he closed the hatch, "or entering the edge of it. If we keep on going we may find ourselves in the middle of a sort of cosmic stew pot. If only we could get some pictures of the ocean actually boiling—"

"You'd have to take them submerged. Think of the steam."

"We might do it with infrared, but we're not going to try. We'll get out of this the same way we got in."

To avoid the stench which entered through her surface ventilator the *Kelonia* fled five fathoms down and started her aërophores—which happily were adjusted to extract nothing from sea water save nitrogen and oxygen. Hoping to find cooler levels below, she descended to her limit—one hundred fathoms—but secured no relief. The limit was a "robot setting" installed by the makers, to circumvent youthful venturesomeness.

Returning to the five-fathom level, Raven started the air-cooling unit. The hour of sunrise passed, and still the vessel groped her way—trusting her radio monitor beams—through a Stygian darkness which testified to the dense pall of steam and gas which lay upon the sea. By means of the sonic detector the voyagers heard far-off rumblings and thuddings from the ocean bottom, three miles below, like the turbulence of a giant caldron.

A heavy storm swept across the sea, raised twenty-foot waves, sent the *Kelonia* down to ten fathoms. The navigators pored over the

charts which had been given them by the Travel Bureau.

" 'Just a great, monotonous expanse of empty waters,' " quoted Raven caustically, "that's what Syrcamor called it. Let's phone him about the boiling-hot monotony that we ran into. Why didn't he warn us?"

"I don't believe that Syrcamor knew about this," rejoined Topaz, "because if this were why he didn't want us to go below Easter Island, there's no reason why he shouldn't have told us. He was trying to divert our thoughts from this part of the sea because of something else—something he knows. Now look. The survey for this square is over two hundred years old. Syrcamor said as much, and here it is in the corner—'Based on SPC Hydrographic Survey Data, 3927.' You can see that they did a very thorough job. This vulcanism must have commenced later—perhaps recently."

"But can this be the first outbreak? And as soon as the sea bottom started popping off as it's doing now, it would register on every seismograph in the world."

"What if it did? Look where we are on this earthquake chart—in the dark-blue zone, and that means 'Region of Frequent Earthquake Occurrence.' It would be just another earthquake, down here in the back yard of the world, so why should anyone grow particularly curious about it?"

"Why hasn't some chance flier spotted the place from the air and reported it? It would be hard to overlook a cloud of steam a mile or so high and several miles across—which I suppose it is."

"Not so hard if one were fifty or sixty miles up, where the transports are—and transports don't fly this way. And any chance wanderers, like us, who might be nosing around in small cruisers without precipitators and low enough to notice it—they'd take it for ordinary fog and give it a wide berth. Down here, it's cloudy or foggy half of the time, and who's going out of his way to fly through fog in the first place? No, I don't believe that Syrcamor knew of this condition; but he does know of something else and tried to steer us away from it."

The blackness of the observation ports changed to a dusky blue-green.

"Look! Sunshine!" ejaculated Raven. "We're out from under the fog. How's the water temperature?"

"Twenty-five."

"Too high for this latitude, but tolerable enough. The bottom must be warm all around here. Tune in the Pitcairn and Easter beacons, Topaz, and check our position. We'll bear south again."

RAVEN took the *Kelonia* to the surface, found the roughness of the sea continuing but much diminished, noted that the air was free of obnoxious gases, cast a weather eye at the partly overcast afternoon sky, and settled down to five fathoms. He whistled cheerfully as he scrutinized the green immensity beyond the forward port.

"This is like navigating the Gulf Stream," he remarked. "The topside is matted with sargassum weed—imagine that! Here's a raft of it now. Look! You can't see the end of it."

The *Kelonia* passed into a verdant dimness like the twilight of forest glades. In truth, the comparison is not farfetched. A veritable forest floated above her, an inverted forest, a floating island of sargassum three fathoms thick. Long pendulous beards of it trailed down even lower

—brushed the *Kelonia's* periscope televisor.

A huge shadow detached itself from the floating forest—a shadow shaped like a monstrous bat, white-bellied, whip-tailed, devil-horned. It glided toward the *Kelonia*.

"Topaz!" shouted Raven. "The bow camera! Here's a manta ray! Three fathoms spread, or I'm a sea squirt!"

"Background of light through sargassum," murmured Topaz, becoming very active at another panel and applying her eyes to a sort of visor like an old-fashioned stereoscope. "Marvelous! I've got it!"

The great shape wheeled like a swallow and skimmed into the obscurity of far green distances.

"Queer we should see one here," reflected Raven. "The mantas are bottom feeders. Topaz, what's bottom?"

"Twenty-five fathoms," announced Topaz, consulting the radio echo-sounder. "Why, that can't be right."

"Of course not. You've dropped a couple of zeros. The chart says it ought to be about twenty-two hundred."

But the echo-sounder stubbornly insisted on indicating ever-decreasing depths. When the reading had fallen to twenty-three fathoms another photographic flurry occurred. A pair of giant sea horses swam with stately deliberation, in their strange but characteristic vertical position, across the *Kelonia's* bow. They were fully twelve feet in length, sea horses fit for Tritons, with rippling manes of tattered kelplike excrescences.

"A new species, a new genus even!" gloated Topaz. "Wait till Prime Center sees this! But they're so big! How have they been overlooked? I'm going to run this through the projector."

The most surprising event which yet had occurred in Syrcamor's "great, monotonous expanse of empty waters" took place within half an hour after the passage of the giant sea horses. Topaz having retired to the photographic cabin, Raven was temporarily alone in the conning tower. The *Kelonia* was maintaining her depth of five fathoms.

Raven suddenly sensed the aura of an intruding presence. He glanced hastily around the control cabin; then his eyes fell upon the observation port aft. A human-seemng face was regarding him through the clear silicoid of the port—a masculine, youthful face. But its smoothly rounded cranium was quite devoid of hair, being covered with faintly phosphorescent tubercles. It had no visible ears and its skin was a lustrous purplish-black like the skin of a salamander. A pair of blunt proturberances like incipient horns projected from its temples. The eyes showed no whites; they were a rich and liquid brown, all pupil, with a glow of greenish luminosity in their depths. It smiled with a flash of white teeth—startling by contrast—and proceeded slowly to execute the lip movements of speech, then paused expectantly as if awaiting some response from Raven.

"Topaz! Drop everything and come to the tower!" Raven called urgently into the ship's telephone, then turned again to regard the face at the port.

A second face, obviously feminine, had now appeared beside the first. At first glance this being seemed to possess a thick mop of bejeweled indigo-blue hair, but closer scrutiny revealed a Medusa crown of close-set tentacular filaments, each tipped with a beadlike light

organ. They rippled in the eddies which swirled around the *Kelonia's* conning tower, writhed and stirred with an independent life of their own.

"Name of a green porpoise! What are those things!" ejaculated Topaz, pausing transfixed as she emerged from the companionway.

"Should *I* know? There's nothing like them known in the four worlds! Their faces are anthropoid, so I suppose they're terrestrial."

"They seem to be speaking to one another, Raven. How can that be?"

"It must be that they're merely going through the motions. It's lip-reading, a practically forgotten art. I've read about it."

"You mean that they can watch our lips and understand what we're saying?"

"So they might, if they speak the human tongue. I hadn't thought of that. I'll speak to them."

Raven gazed directly into the eyes of the enigmatic visitors and slowly uttered the words:

"Do you understand what I am saying?"

The two heads nodded eagerly.

"Then if you want to communicate with us you must use the Emergency Code. Do you know what that is? Tap on the hull," Raven concluded.

Again the visitors nodded their comprehension, the masculine head vanished from the port, and a rapid metallic tapping became audible in the conning tower.

The Emergency Code to which Raven referred was a system of signaling which had not been excelled in two thousand years for simplicity and adaptability to makeshift apparatus. The name of the inventor was the theme of a perennial minor controversy among historians; no printed data regarding him had survived the catastrophic twentieth century, and a fragment of sound film from around 1950 was not too clear as to enunciation. His name may have been either Marsh or Morris.

"We have swum too far from our base," the tapping signals spelled quickly. "We are near the limit of our endurance. Need food and rest. We beg you to open your air lock and admit us to your vessel."

"Shall we?" asked Raven doubtfully.

"*Shall* we?" Topaz echoed indignantly. "What a question! Of course we shall! This is terrific! It seems that we've discovered a marine species of Man—where they've been hidden I can't imagine—and you ask, 'Shall we let them in?' And we're the first ones to see them! Open that air lock!"

THE INNER DOOR of the air lock thudded shut and the two ocean dwellers faced Raven and Topaz in the diving locker of the *Kelonia*. They were a head taller than the young navigators, and their bodies seemed molded of ebony with a purplish sheen. Their features were Polynesian rather than Negroid. Their only garments were sandals and elastic cinctures which sparkled bluely as if covered with dust of sapphires. Various small implements and containers were attached to the waistbands. The protuberances on their foreheads quivered, then uncoiled like giant butterflies' proboscises and expanded into membranous, fronded antennæ with cartilaginous midribs. Against the luminous ceiling of the diving locker the fronds of membrane showed translucent, a deep ruby-red, and throbbed with the pulsations of blood. Raven and Topaz involuntarily retreated a step.

The male individual coughed, gasped, spurted triple jets of water from openings in his sides beneath the armpits, and spoke. His voice was a resonant bass.

"These appendages which startle you are auditory organs," he informed them. "I am called Cragstar, and my companion is Merling. We are not, as you may think, some sort of strange other-world creatures. Strictly speaking, we are not human; yet you can see for yourselves that we and you are similar in many respects. We are—what shall I say?—other-human. Submarine Products has called us Tritons, a name which we feel was admirably conceived."

"Submarine Products!" repeated Raven, his mind spinning dizzily. "You mean—"

"I mean . . . we are . . . a sort of creation," Cragstar replied laboriously, as if thinking were difficult.

"Why have we never heard of you?" asked Topaz.

"You shall be told everything in due time," replied Merling, leaning wearily on Cragstar's arm, "but at present we need food and sleep. If we had not chanced upon your cruiser— We were overconfident of our prowess as swimmers. How far are we from Easter Island?"

"At least nine hundred miles!" Topaz exclaimed. "You don't mean to say that you have swum from Easter Island!"

"No. Easter Island was our destination," responded Cragstar. "It was very ill-advised. But we were desperate, and acted hastily. We fled from Triton Reef—"

He hesitated, swayed, thrust a hand against the air-lock door to steady himself.

"No more questions!" commanded Topaz. "What are we thinking of, Raven? Help them to our cabins. I'll go ahead and start the kaffina. Do you drink kaffina?"

"For that, and food, and sleep, we shall be eternally grateful," Cragstar declared. "Afterward you shall have the whole story."

IV.

"All this is more than a little bewildering," protested Raven. "You say that this reef was thrust up to the surface more than two centuries ago, yet it has never appeared on any chart."

"It has been rising slowly during a much longer period of time," corrected Cragstar, "and I should have said that it did appear on a few highly confidential charts in the possession of Prime Center and Submarine Products Corporation. The region was never a much-traveled one; by various subtle means Prime Center caused it to be traveled even less. But in spite of this, the Reef was occasionally discovered by private cruisers. The navigator would complain about the obsolete chart. Submarine Products would reply, 'These volcanic islets come and go very erratically. It will be included in the next revision—if it is still there.' And there the matter would rest and be forgotten."

The four were taking their ease in the cluttered seagoing studio aboard the *Kelonia* wherein Raven and Topaz produced experimental photosketches of their animated murals. The complex bulk of a drafting robot dominated the cabin. The newcomers had been invigorated by fourteen hours' sleep and such nourishment as they had judged appropriate to their exhausted condition. This prolonged sojourn out of water seemed to cause them no discomfort, but their bodies had assumed

a different hue—a rich plum-tinted gray with an oily gloss. Merling's crown of medusoid filaments lay upon the nape of her neck in a satiny, blue-black mass wherein the restless light buds stirred like an uneasy swarm of pale fireflies.

"You call yourselves Tritons, as if you were something nonhuman, or another species," commented Topaz. "Yet you say that you're as human as we are—with a difference. And I gather that Submarine Products has somehow created you, and a whole community of others like you, in this uncharted place which you call Triton Reef. Do you mean that you are human beings—made over?"

"If you're thinking of plastic surgery the answer is no," Merling replied. "We were born just as you see us, of Triton parents. But in a sense we are reconstructed human beings. The first Tritons were— Did you ever hear of a tectogenetic species?"

"The world is full of them; most of our domestic animals and plants are that kind of species," responded Raven. "I know how they're produced, in a general sort of way, but I didn't know that the technique had reached a point where it could be applied to human beings. There you have the brain to consider. You take living chromosomes, break them down into their separate genes and preserve the genes alive in pure culture. You can do all sorts of strange things with the isolated gene cultures. Then you rebuild the chromosomes into a new pattern and implant them in denucleated germ cells. From there on it's a simple matter of gestation—or seed formation if you're working with plants—*in vitro*. The process doesn't create life. It merely shapes living matter into new forms."

"Pater Vervain himself could not have explained it more concisely," observed Cragstar, "and the process *can* be applied to human material—due care being taken not to tamper with the brain, which continues to be too uncertain an undertaking for the biotechnicians. Submarine Products has applied it, and we are specimens of the result."

"But why should the affair have been so shrouded in secrecy?" Topaz objected. "Why was this unheard-of reef chosen as the scene of operations? It isn't in keeping with the modern spirit. Everyone should know about the Tritons. The mere fact that you exist—it's the disclosure of a whole new world—"

"In a word, it opens a vista of limitless possibilities," declared Cragstar. "Therein lies the answer to your questions. About ten generations ago the world peered into that vista and was frightened by what it saw. Prime Center proposed a very conservative scheme for eliminating various troublesome items of the human anatomy by gradually replacing the existing race with an improved tectogenetic variety. Obviously this would take a very long time, but it stirred up a tremendous wave of opposition—not unanimous, but quite overwhelming. 'What really are we proposing to do?' it was argued. 'If we make these seemingly innocent changes, what will follow? Will not these first changes in the human body be followed by still others, ever more and more radical as the technique improves? What of the social consequences? Will there not be inevitable friction between normal humanity and these others? Will there not be an ever-widening gulf between us and them, even a rebirth of war?' Such were the words which flew about the world,

even before the idea of the Tritons was conceived."

"How queer people were then!" Topaz interjected. "I remember talking about that with our counselor in history."

"Among the biotechnicians at Prime Center there was one by the name of Tamarac," Cragstar continued. "He accused his colleagues of timidity because they heeded the popular clamor and decided to pigeonhole the project. He jeered at the project itself as lacking in boldness. Instead of modestly planning to eliminate the vermiform appendix and a few other trifles, Tamarac suggested the creation of a radically new human species. He pointed to the waters of the world and said: 'Here is a domain covering more than seventy-five percent of our planet's surface. At present we are mere awkward intruders in that domain, with our armor and submersibles. Let us devise a kind of Man who can dwell in the waters as well as on the land, and make the whole Earth truly ours.' He was persuasive and persistent, and Prime Center was predisposed in his favor. They couldn't refrain from going into the project; it was much too intriguing."

"We've never heard of the project," asserted Raven. "There are suggestions afloat that something of the sort might be attempted."

"Test buoys. Prime Center set them afloat," responded Cragstar. "The whole affair was conducted very discreetly; all the workers were carefully selected. Triton Reef appeared not long after Tamarac had proposed his scheme, and Submarine Products transformed it into a biotechnical base. They quietly discouraged travel in that region, delayed the revision of charts, diverted transport lines. And Prime Center set about subtly molding public opinion through the educational system."

"This base at Triton Reef—tell us about it."

"NO PART of it is visible above water. From the air, the Reef appears to be no more than a straggling cluster of crags and barren islets. But down below, caverns have been hollowed out, level below level, filled with air, with watertight linings and air locks. The shallower parts of the bottom have been covered with submarine roofs of silicoid, part of the water pumped out, and submarine pools and air spaces thereby created. The Reef has its own power plant, circulating conditioned air and sea water, submersible docks, a foundry and workshops, schools and laboratories, dwelling pools for the Tritons. In short, we have everything but freedom of movement. It is understood that no Triton shall leave the immediate neighborhood of the Reef."

"And you two grew weary of confinement?"

"Every Triton grows weary of it, but that isn't why we tried to escape. As a matter of fact, Prime Center notified us over a month ago that we might commence preparations for abandoning the Reef. It seems that the world is nearly ready to be told about us. We shall be accepted as human beings, not monstrosities."

"Then why—"

"We younger Tritons have stirred up trouble for ourselves," Cragstar began slowly, coiling and uncoiling his auditory antennæ. "You see, the elders grew up under the shadow of a fear—the fear of they knew not what unpleasant treatment at the hands of a hostile world, if that world should discover them. And now that we seem to be on the eve

of our release from Triton Reef, they desire nothing to occur which might revive that hostility. But some of us have been trained as biotechnicians, and we feel that the Triton is merely a preliminary step. We want to go on to more ambitious attempts."

"Of course; that's obvious," Raven agreed. "But what have you in mind?"

"The workers who created the first Tritons really made no great changes in the human form," argued Cragstar, as if he addressed some unseen tribunal. "Instead of lungs we have a gill cavity which—out of water—functions as a lung. Our fingers are webbed together up to the first joint." He held up his hand. "We have antennæ instead of ears. We are not inconvenienced by a stomachful of sea water nor considerable variations in depth pressure. There are still other lesser differences. But we are nevertheless manlike beings, and our mental powers are not measurably different from those of normal humanity.

"But is this to be the end? Must we forever restrain ourselves from going beyond the Triton? We shall populate the sea; what of the air? What of the vast world of little things, where flowers are trees and a meadow is a boundless forest? What of our neighbor planets, where Man exists only as an alien? What of the unknown worlds among the stars?"

"As Raven has said, there is the brain to consider," Merling went on. "Very few people have dared to alter the human cerebral genes; the results have been discouraging—sometimes horrifying. But we can't evade the logic of the facts. We must come to grips with this problem of the brain and conquer it—even though it may mean the creation of a whole menagerie of experimental monsters."

"And when we have conquered the problem of the brain," added Cragstar, "Man will begin to mold his brain as he has now begun to mold his body, and the Universe will be in the palm of his hand."

"Magnificent!" cried Raven. "And do you mean to tell me that your counselors don't approve of these ideas? You said that you had stirred up trouble for yourselves."

"Our elders think that they are rather horrible ideas," replied Merling. "They are afraid that the world will turn against us. One elder in particular, called Cymorpagon, has been very vehement. Pater Vervain said that their fears are unfounded. Pater Vervain is our general counselor and the only Drylander on the Reef; Prime Center gradually withdrew the others as the Tritons became self-sufficient. We had a shocking row with Cymorpagon and the other elders. Pater Vervain was on our side, but that didn't help."

"What happened?"

"Cymorpagon tried to browbeat us into abandoning our plans. He demanded that we promise never to mention them again. When we refused, with Pater Vervain's support, the elders seized control of the Reef. They placed all the exits under guard and took over the submersible docks and the stereophone transmitting station. Cymorpagon assumed command of everything and wouldn't permit Pater Vervain to communicate with Prime Center. He ordered that all the younger Tritons who favored the brain research should be hypnotically conditioned, so that all the rest of our lives we should look on the idea with horror and wouldn't dare to refer to it. So we all retreated to one of the dwell-

ing pools and locked ourselves in."

"Locked yourselves in a pool? I don't understand."

"It's a lake, really, in a submarine air space with a silicoid roof. The portal is a sort of valve. We couldn't appeal to Prime Center, because the elders had control of the stereophone. The nearest transmitter that we know of is located at Easter Island. Cragstar and I thought that by swimming and drifting we might be able to go that far. Oh, we realize that it was absurd. The others cut a power line and stopped an air blower. We went through an air duct and the blower and came out of a vent on one of the islets of the Reef.

"One doesn't really appreciate distances when looking at charts—especially if one has never traveled more than a few miles. After swimming one day and night we began to understand the true vastness of the sea."

"The night swimming was the worst," said Cragstar. "We seemed to be hanging in a gulf of blackness and not making an inch of progress. And there were things swimming in the blackness—things with lights on them. We couldn't tell whether they were near and small or far away and gigantic. We were afraid to sleep. We saw the lights of your craft on the second day, heard her turbines humming. It was a beacon of hope. Merling lost her tube of food concentrate the day before."

Raven leaped to his feet.

"The *Kelonia* and all its resources are at your service," he announced. "First of all, let's get Prime Center on the phone."

V.

At latitude thirty-nine south, longitude one hundred and twelve west, the sea birds wheeled and flapped through turbulent wraiths of milk-white fog. They soared, mewing and clamoring, upon the updrafts of a steady southeast breeze, skimmed the sleek crests of an interminable procession of pearl-gray rollers like marching hills. They saw the mile-long billows sweep out of the fog-veiled beyond, saw them smash thunderously against a splintered battlement of black igneous rock, saw them leap heavenward in shuddering geysters of spume and collapse in cataracts of foaming wrath. The fog parted capriciously, opened up a colossal moving corridor beyond the barrier, and revealed a multitude of close-set rocky tusks and islets—a desolate, spray-drenched archipelago. One could have imagined it to be the emergent peaks of a primeval continent rising from the steaming seas of a youthful world. Yet under that bleak, inorganic mask of somber crags and foaming waters there pulsed a current of strange life in the deep caverns and green-lit pools of the Triton community.

The conference hall of Vervain, the general counselor of Triton Reef, was twelve fathoms below sea level. The smooth green walls of vitrolith, inlaid with faintly luminous shapes of cuttlefish and sea anemones, were pierced along one side of the chamber by three great circular ports of silicoid, immensely thick. These openings revealed the cunningly lighted depths of a submarine gorge, forested with the slender spires of needle-tufted algæ, and admitted a diffuse berylline radiance. A giant sea horse sought with futile persistence to swim through the clear substance of the central port.

An uninformed observer, seeing the chamber in its green obscurity,

might have wondered whether it was a hall of statuary or a museum of pathological specimens. It was crowded with motionless, ambiguous figures—some human in form, others unclassifiable—ranging in size from dwarfs to ten-foot giants. There were bodies without heads, heads without bodies, detached limbs, limbless torsos, skinless creatures displaying their muscles, skeletons, and complete forms. Actually they were anatomical models with skeletons of metal and artificial musculatures—students' exercises in construction, and the discarded sketches of beings conceived in the restless brains of ten generations of tectogeneticists.

Vervain stood beside an erect,

Beyond the submersible's port, two human, unhelmeted faces floated—a man and a girl—deep beneath the surface!

biped test model whose head was a lens-eyed globe of aluminum; instead of arms it possessed thick, jointless tentacles terminating in hands; steel ribs glinted from beneath the unfinished muscular covering of the body. Facing the counselor was a delegation of Triton elders. Elders and counselor were clad only in sandals and cinctures of scintillating mineral fabric; no more was necessary in the uniform internal climate of Triton Reef.

"Assume that I submit to your ultimatum," suggested Vervain, regarding the elders quizzically. "Assume that I agree to inform Prime Center that these determined youngsters are irresponsible and unprepared for liberty—which emphatically I do not believe—and then, when you have given me access to the stereophone, what is to prevent me from stating my true opinion?"

"Then we should shut off the transmitter, Pater Vervain," declared one of the Tritons. "But we know that you would not stoop to trickery. We ask only your cooperation."

"You seek it by strange methods, Kalamar," retorted Vervain. "The whole situation is preposterous. Here am I, a prisoner in my own quarters, without light or power—"

"Your circuit has been broken in the Dolphin Pool, where the rebels barricaded themselves," explained Kalamar. "They shut off a blower, and we suspect that some of them may have escaped through the air vent. But the vent has been sealed, and the aërators of Dolphin Pool have, of course, been shut off also. But there is still air in the pool. Hunger, not lack of oxygen, will defeat these obstinate ones."

"We have not had your answer," another elder remarked bluntly. "Will you speak to Prime Center as requested?"

"When I do speak, Cymorpagon, it will be on my own responsibility and not in accordance with arbitrary instructions," replied Vervain in a pleasant conversational tone. "I shall merely wait upon events. Prime Center will call us if we do not call them. If I do not respond in person, you must sorely tax your ingenuity in explaining my nonappearance."

"In plain words, you refuse," declared Cymorpagon. "Therefore, I shall confer with Prime Center and shall say that you have appointed me as your spokesman."

Cymorpagon differed from the other elders. He was hugely built, apelike in depth of chest and length of arm. His head was depressed between his shoulders with scarcely a vestige of neck, and his eyes glowed beneath a continuous horizontal supraorbital ridge. His auditory antennæ were short, stumpy tentacles with terminal tufts of bristling black spines.

"For me to appoint a spokesman would be unprecedented," Vervain observed. "Certainly you would find it difficult to explain, and it would cause an immediate investigation. When in due time you return to rational thinking, I am sure that all of you will see yourselves in a somewhat humiliating light."

The air of the conference hall was shaken by the sound of a remote, ominous growling. The vitrolith pavement quivered, and some small object fell with a metallic tinkle.

"Ready or not, we have there a cogent reason for abandoning the Reef," remarked Vervain. "The shocks are becoming more frequent."

"The Reef has been shaken by occasional feeble temblors for two

hundred years," replied Cymorpagon impatiently. "Oh, I know what the geophysicists say at Prime Center! They say that their stress diagrams and charts of rock movements show that another period of relatively rapid upheaval is imminent. I don't believe it. It is merely a ruse to hasten our departure."

"A ruse? What new fantasy is this?" asked Vervain, lifting one eyebrow. "As the supervisor of the geodyne plant you have had ample opportunity to check the accuracy of the data supplied by Prime Center. Why have you not questioned it until this moment? Why should anyone desire to hasten our departure by a ruse? Your thoughts are in a ferment of strange imaginings."

"I say it is a ruse," insisted Cymorpagon. "This proposal to separate us into a multitude of little colonies scattered over the seas of the world—that also is a ruse."

"That is absurd on the face of it," smiled Vervain. "The multiple-colonies plan was devised by your fellow Tritons and approved by an overwhelming majority—because you could not agree on any single location."

"Why could we not agree?" demanded Cymorpagon. "Who dares deny that we were swayed by subtle propaganda from Prime Center?"

"Your statements are uniformly more and more incoherent," Vervain commented. "Tell me plainly what you have in mind. What is the true meaning of all these dark hints of ruses and deception and propaganda?"

Cymorpagon inflated his great chest and allowed the air to escape hissingly from the intercostal vents of his gill chamber while he glowered at Vervain.

"The biotechnicians at Prime Center are convinced that the Triton experiment is a fearful blunder," he announced belligerently. "They regret that we were ever created. They fear us, because they have recognized at last that we are a superior race and shall speedily dominate this world—unless we are prevented! When we have been divided, scattered abroad, rendered helpless—then comes the day of reckoning!"

The elders stirred uneasily. Vervain thought:

"Acute psychosis—persecution complex. Wonder how it started. The isolation, probably. He showed a melancholy streak, even as a child. Good thing we're all leaving the Reef soon. Have to persuade him to receive treatment. Going to be difficult."

Aloud, Vervain said:

"It is strange that you alone have discovered these things and that they have been withheld from me. Do you happen to know exactly what will occur on this—day of reckoning?"

"I do. Prime Center will seize upon some convenient fact and declare us a menace to Drylander supremacy. The brain research project of our young Tritons will be the convenient fact. Then we shall be forced to submit to wholesale sterilization and our kind will become extinct in the span of a lifetime."

Abstractedly Vervain laid his hand on the side of the test model beside him, unwittingly pressed an inconspicuous control. The figure trembled, groped with its hands, took one stride forward. Vervain hurriedly halted the motion.

"It has never been my impression, Cymorpagon, that the men and women at Prime Center were particularly concerned about this Drylander supremacy which you mention," said Vervain. "Nor is any

rational human being. Your thoughts have a flavor strongly reminiscent of certain phases of ancient history. Your charges are very disturbing, and I must insist on tangible proof. Can you produce it?"

"I can. It is under lock and seal in the geodyne plant."

"Have you shown it to anyone?"

"He has not," responded several elders with alacrity. "He will not reveal the nature of the evidence nor how he secured it. We realized that a certain hostility toward us might still exist—even though the preponderance of opinion is favorable—but nothing like this, and not from Prime Center. It is incredible. We demand to be shown."

"I would prefer that you first examine the evidence privately," Cymorpagon declared.

"As you wish," agreed Vervain.

VI.

THE SUBMARINE gorge, which was revealed through the triple ports of Vervain's conference hall, was floored with vitrolith overlaid by two centuries' accumulation of coral sand and marine growths. In the air space beneath this false sea bottom lay the geodyne plant, the power heart of Triton Reef. It had pleased the fancy of the builders to support part of the vast load of vitrolith and superincumbent water on five pairs of mighty pillars in the shape of upraised arms, the palms of whose hands were pressed against the ceiling. The pillars were of cloudy, translucent material, vernal green, and glowing with internal light.

In the aisle between these columns stood five squat, fluted towers of dark metal which housed the superstructures of the geodyne converters. Each converter projected a cylindrical space distortion, known as the "guide warp," vertically downward to a depth of about eighteen hundred miles, where it impinged upon the surface of the nickel-iron core of the Earth. A beam of high-frequency compressional space waves—not the transverse waves of stereo—streamed constantly downward along the guide warp and was reflected from the natural warp surrounding the core, whence it abstracted an increment of energy and retraced its path. This increment, converted into electricity, was sufficient to drive the converters and to deliver an abundant surplus for other uses.

The converters operated noiselessly. There was no sound in the hall of pillars save the silken whisper of circulating air. Vervain, Cymorpagon, and their retinue of elders appeared from behind the farthest converter. Besides it, they were dwarfed to the stature of dolls. Their girdles and sandals flashed with winking stars of emerald fire under the green illumination.

Double, water-tight portals admitted them from the hall of the geodyne converters to the high-ceilinged chamber of the co-ordinating robot which controlled the converters and regulated the flow of air and water through the labyrinthine pools and bulkheaded compartments of the Reef. Cymorpagon's assistants, on duty before the multiple indicator panels, glanced curiously at him and his companions. At the farther side of the robot chamber, Cymorpagon turned to the other elders.

"Wait here," he ordered. "We two shall go on alone."

He stepped upon a square white floor slab. A section of the wall receded, drew aside into a slot, re-

vealed a black opening. As Vervain and Cymorpagon entered, a gentle glow of light replaced the darkness and the door closed behind them.

The light issued from sources sunken in a pool which nearly filled this antechamber of Cymorpagon's living quarters. A flight of steps descended from its brim. On the opposite side of the pool a submerged archway was visible through the green water. The smell of the sea was in the air.

"Now let us see your evidence," requested Vervain.

Cymorpagon whirled upon him with a truculent glare.

"You suspect that I have no evidence to produce!" he exclaimed violently. "It speaks in your eyes, in the tone of your voice! You think me mad! You have always thought me somewhat stupid—you and your Drylander friends! Yes, even my fellow Tritons! That is why I was relegated to this imbecile's task of tending a machine which runs itself!"

"It is worse than I suspected," thought Vervain, but he said:

"You have earned your place in the geodyne plant because others could not fill it so well. Sometimes one suffers from too long and too close an association with one's work. When we have left the Reef —or now, if you choose—you may forget your work until you wish to return to it."

"So! You are hinting at my retirement! You would strip me even of such small honors as I have! You are thinking that I am a product of Tamarac's earlier technique—an abortive creature! I read your unspoken thoughts! I am penalized because of mere physical difference! But you shall see—the whole world shall see! Do you know what I can do?"

"No. Tell me."

Cymorpagon's fury vanished in an instant and was replaced by a confidential manner. He glanced over his shoulder, drew near to Vervain, and spoke eagerly.

"I have carried the theory of the geodyne converter far beyond its previous state. I have discovered totally new possibilities. Suppose the guide warp were projected against a surface of minor discontinuity—say, at a depth of forty miles—and a carrier wave of ten times our present standard frequency were employed. What would happen?"

"You would waste most of the energy. You would pour it into the depths of the Earth. Nothing would happen."

"On the contrary. The high-frequency carrier waves would slowly build up a local increase of magmatic pressure. Eventually a tremendous upthrust would occur, and an earthquake would result. I shall prove it."

"How?"

"One of the converters is operating on a split warp. I made the readjustment secretly. Ten percent of the carrier beam is directed obliquely downward at a point five hundred miles to the northeast and forty miles down. The stresses have been accumulating for five months. The tremors which we have felt have been merely premonitory and the final upthrust is now due at any time. Prime Center is merely pretending to make predictions."

"Amazing! You must show me your calculations. Now, as to this evidence of Prime Center's treachery. We must go over it together, weigh all the facts. Then we can

decide what we should do."

Cymorpagon pointed toward the sunken archway.

"I have it in a secret vault. You will see."

"In your sleeping pool? I shall need a helmet."

"Not at all. There is an air space beyond, which I prepared myself. You have only to dive through that portal and swim under water for thirty or forty strokes."

Cymorpagon dived into the pool and drove himself through the archway with a powerful froglike kick. Vervain poised himself for a dive, was suddenly smitten by a formless apprehension, relaxed and retreated a pace. Then he shrugged his shoulders impatiently and dived after Cymorpagon.

THE WAITING elders strolled restlessly along the aisles between the clicking, humming indicator panels in the chamber of the co-ordinating robot.

"Cymorpagon knows everyone in the crew of the *Tarpon*," remarked one of the elders. "He always goes aboard when she comes down with supplies. Perhaps he got his information from them."

"That would be mere hearsay, whereas he claims to have tangible evidence," objected another. "Possibly he found some document or recording, packed by mistake in a shipment of personal supplies."

These words were cut short by a jarring concussion and the sound of a muffled *boom*. The lights in the chamber blinked. After a brief, startled silence the elders' voices rose in an agitated babble.

"Was that an earth shock?"

"It sounded like an explosion!"

"Could it be that our children in the Dolphin Pool are resorting to violence?"

Partial verification of this latter surmise arrived almost at once. One of the Triton attendants of the co-ordinating robot, perched before an indicator panel, spoke rapidly into his telephone, saying:

"There is a breach in the Dolphin Pool. The pool pressure is rising rapidly and approaching that of the corresponding sea depth. The emergency locks have tripped on all portals."

An event of even more potent interest now diverted the attention of the elders from this announcement. Vervain had emerged from Cymorpagon's quarters.

The elders looked questioningly at Vervain, and each one felt himself or herself disturbed by an occult unease. It was not the same Vervain.

The source of this disquieting impression was difficult to specify. There was a subtle difference in his gait, his posture, his facial expression. He walked with a suggestion of hesitancy, as if he were not quite sure of the point in space at which his feet would meet the pavement. His movements were tense, somewhat like the movements of a man balancing on a tight wire. And, contrary to Vervain's usual alert expression, his features were inscrutable—conveyed only a fathomless abstraction.

The elder called Kalamar ventured to ask:

"What did you learn, Pater Vervain?"

Vervain turned his eyes toward Kalamar, but seemed to look through him at some remote object.

"I have learned of man's inhumanity to Tritons," responded Vervain, and the very timbre of his voice was unfamiliar. "I cannot discuss the matter now. I must speak with Prime Center at once."

Kalamar drew in his breath sharply and cried:

"Do you mean . . . that Cymorpagon's charges . . . are the truth?"

"Undeniably," Vervain replied. "I went— Cymorpagon took me to a secret air vault beyond his sleeping pool, and I saw— But we shall speak of that later. I presume that now I shall be granted the use of the stereophone."

As the elders followed Vervain through the hall of the geodyne converters in a stricken silence, Kalamar and one other drifted to the rear.

"My thoughts are sunken a thousand fathoms deep in confusion," declared Kalamar, "but I am puzzled, Nautilus, by one small circumstance."

"What is that?" inquired Nautilus gloomily.

"When Vervain came from Cymorpagon's quarters I observed something which has hitherto escaped me during all the years of our friendship. His neck is encircled by a thin, pale hairline—like the scar of an attempted decapitation, or the brand made by a ring of hot wire."

VII.

SINCE current means of transport had reduced geographical accessibility to the status of a minor factor, Prime Center reared its architectural immensity near the northern border of the one-time Kalahari Desert in South Africa—a region selected because of the local minimum probabilities of earthquake, flood, hurricane, or climatic extremes.

Eight men, the Triton Reef Council, were seated at a horseshoe-shaped table in a subbasement of Prime Center. Their eyes were fixed expectantly on an object inside the horseshoe—a stereophone receiver like a sundial stand with a luminous face. But no image rose from the disk. Nothing came forth save the voice of Graihalk, the coppery-hued stereophone operator, who was visible at the control board through a glass partition.

"Triton Reef does not answer," reported Graihalk. "Shall I keep on trying? Supervisor Walfram of the S. P. C. base at Samoa is waiting to come in."

"Put him on," directed a dusky counselor with an unmistakable African brogue, "but keep trying for Triton Reef."

The disk erupted a miniature geyser of curdled bluish radiance which resolved itself into the seated, full-sized image of Walfram. Simba, the African biotechnical counselor, and the thronelike stereophone transmitted which he occupied, also flickered with a faint glow. Walfram glittered in tunic and shorts of silver scales; two silver fins, like the pectoral fins of a flying fish, flared on either side of a close-fitting cap of ultramarine blue.

"The first squadron of five transports is at Tahiti and will proceed to Triton Reef when ordered," Walfram announced. "They are prepared to evacuate the Tritons, their personal belongings, and the archives of the Reef. A squadron of freighters for removal of the heavy equipment can get under way within twenty-four hours. Only the ships' captains are aware of the nature of their mission. When do we start?"

"Now," responded Simba. "We are trying to notify Vervain, but for some reason we can't raise Triton Reef on the stereo."

"There is also a small matter of which I have just been informed," continued Walfram. "Pitcairn Island has notified us that the turtle boat *Kelonia*, a small photographic

cruiser manned by a couple of S. P. C. protégés, is two days overdue from Easter Island and has not reported her position. Both navigators are young and one of them tends to take long chances, according to her record. Someone at the Andros Travel Bureau seems to suspect that they are interested in the Triton Reef area. Our special Reef supply ship, the *Tarpon,* happens to be in the vicinity and we have ordered her to investigate at once."

"These modern youngsters and their little run-about submersibles!" grumbled Counselor Haldemir, who was also a director of the Transport Corporation. "Just last month one of them crawled out on an antarctic ice floe, froze down, and we had to send a crew to thaw her loose. Five thousand kilos of calcium chloride! There were three aboard—and they were photographers, also!"

"Triton Reef will be given full publicity very soon," responded Simba, "so its accidental discovery by the *Kelonia* would be of small importance now. Your transport captains may inform their crews. But the vessel may be in distress. It was well to advise the *Tarpon.*"

Walfram's image became cloudy and vanished.

"How about Triton Reef, Graihalk?" inquired Simba.

"Triton Reef does not answer," came the reply, "but you have a call from Moongold, your confidential observer in Saigon."

"Let's have it," directed Simba.

"Go ahead, Saigon," said the operator, and another projected likeness appeared before the counselors—the likeness of a fragile, ivory-skinned girl, her inky hair coiled in a dark tower. A garment like a short-sleeved surplice fell from her shoulders, bore a crimson device upon the breast—a dragon encircling the globe of the world.

"I am reporting an undertaking of my colleagues in the regional Research Planning Conference of Lower Asia," musically enunciated Moongold. "By a referendum among forty million qualified adults they are petitioning the assistance of Prime Center in a revival of Tamarac's project to create an aquatic human species. If Prime Center does not see fit to supply them with Tamarac's data, they intend to proceed with an independent local enterprise. In complete igno-

rance of Triton Reef they have developed an almost identical plan which they intend to carry out on Nightingale Island in the Gulf of Tonkin. To date, the referendum shows an affirmative response of ninety-one percent."

"This practically completes our survey!" exclaimed Counselor Chadayana, otherwise an educational specialist. "By various direct or indirect means we have sounded out the sentiments of the entire population of the world. It is an interesting fact that, with certain reservations, the percent of favorable reactions increases with decreasing ages of the groups under observation. Very young children are unanimously enthralled by the idea of an underwater people."

"You may say that Prime Center will assist the enterprise by whatever means may be necessary," Simba assured Moongold, and her image faded and was gone.

"Now, Graihalk, have you heard any response from Triton Reef?" persisted Simba.

"Triton Reef does not answer," the operator's voice intoned. "There's something not all right at Triton Reef. The stereo plant must be deserted. They have duplicate transmitting and receiving units. If both units go bad at once, they can fall back on radio—

"Hold on, there's something coming through now!" Graihalk interrupted himself. "It's Triton Reef! . . . No. . . . The direction is a little off, but it's from that vicinity. Low-power outfit, or an inexperienced operator Fumbling around. Can't quite adjust his harmonics to our receiving warp. Must be someone in the Reef organization; he wouldn't know the wave pattern of the council beam otherwise. Here it is. See what you can make of it."

The space above the receiving disk boiled with phosphorescent turbulence, in whose depths a shape seemed struggling to take form only to be shattered, like a reflection in rippling water. And a sound came with it, a sound as of an avalanche of broken glass. A voice was trying to make itself heard behind this curtain of noise.

"—fifty-five minutes south, longitude one hundred . . . can you hear—" the voice came fitfully.

"This is the Reef Council operator at Prime Center," responded Graihalk. "We can scarcely hear you. Your beam is entraining deep earth waves. Shift your pattern upscale five or six Angstroms and key down the third harmonic about two percent."

The image steadied and clarified suddenly, revealed Cragstar seated in the *Kelonia's* stereophone transmitter.

DUE to the compact construction of the control cabin, the margin of the transmitting field was picking up portions of adjacent gadgets—mechanical fragments which appeared to be suspended in air about Cragstar.

"How am I coming through?" inquired the Triton youth.

"Perfectly now, Cragstar. But where are you?" responded Simba. "Graihalk says you are not at Triton Reef."

"I'm not. I'm aboard the turtle boat *Kelonia*, about eighty miles northwest of Triton Reef—"

His image blurred as if seen through a fog.

"You're fading out," warned Graihalk.

A baffling movement of cloudy shapes took place; then the image clarified again and disclosed Raven.

"I'm taking over for a while," an-

nounced Raven. "I know the whims of this transmitter. Cragstar and his companion, Merling, are with us because we picked them up at sea. They tried to swim to Easter Island."

"Fantastic! Why did they do that?" exclaimed Simba.

Raven repeated the information which had been given by the two Tritons.

The counselors listened—incredulously at first, then with indulgent smiles—to this tale of cautious age and innovating youth.

"All this wild alarm is quite pointless," Simba said at last. "We are fully aware of all the implications of the Triton Reef experiment. Of course, the work must go on. Of course, we must face the problem of the brain, but at present we scarcely know enough even to begin. We are laying the groundwork as rapidly as possible, and we shall welcome the enthusiasm and assistance of the young Tritons. But there is no need for haste, and for many years to come we shall be occupied with launching the Tritons as free citizens of the world. You may tell the elders that. No, I shall tell them myself. But wait! Do you know what has happened to the stereo at Triton Reef!"

The heads and shoulders of the two Tritons appeared out of space as they leaned forward into the transmitting field, alongside Raven.

"No! What's wrong with it?" they demanded.

"We can't raise a murmur, and Graihalk has been trying for half an hour."

Cragstar and Merling looked at each other.

"Probably another big row going on," hazarded Merling, "and everyone is there, with Pater Vervain in the middle of it."

The face of Topaz now appeared beside Merling's.

"We ran into a sort of marine gas works about two hundred miles north of here," she announced. "The sea was steaming hot and smelled abominably of hydrogen sulphide and dead fish."

"That is unpleasantly near Triton Reef," said Simba quickly. "Graihalk, call the Geophysical Survey for confirmation."

"What shall we do now?" Topaz inquired.

"Lay your course for Triton Reef," Simba directed. "I would not have Merling and Cragstar exhaust themselves by further long-distance swimming. Try to contact the Reef by stereo. We shall do likewise. If you succeed, report back."

"We'll photograph it from stem to stern," declared Topaz. "Give us the bearings, Cragstar."

The quadruple image vanished in a whirl of luminescence.

"That accounts for the *Kelonia*," commented Simba, while the remainder of the council burst into voluble discussion. "Graihalk, notify Walfram to recall the *Tarpon*. And how about the Reef?"

"No luck. Not a sound. But Narhajian of the News Exchange has been clamoring to get in for ten minutes."

"Let him in."

The projection of a swarthy, broad-shouldered individual, draped in an abbreviated black-and-white cape, sprang into visibility.

"How long before you make up your minds?" stormed Narhajian. "When can I release all this stuff about Triton Reef? I tell you, I can't sleep. For years I've been in the Reef organization, keeping my mouth shut and never expecting the

story to break during my lifetime. I've turned out all the indirect stuff just as you asked. Now you keep me in suspense for a month! How long does this go on?"

"I am happy to say that you may now release everything," Simba informed him. "You may open the floodgates and let the deluge roll."

Narhajian gaped, speechless for the moment, then grabbed wildly for his transmitter switch and flicked from view.

"Geophysical Survey reports continuous weak Earth tremors from a new focus three hundred miles north of Triton Reef," announced Graihalk; then proclaimed triumphantly:

"Triton Reef coming in strong! Vervain in person!"

The shining emanations of the stereophone disk resolved themselves into Vervain's figure. For a few seconds he sat, hands on knees, and regarded Simba impassively—the picture of monumental immobility. When he spoke, his lips parted but did not otherwise move perceptibly; it was as if the words were uttered through clenched teeth.

"For your information, let me say that our stereo reception is perfect," he began. "Your prior calls were not unnoticed, but for various reasons I did not choose to respond. I must now advise you that whatever preparations have been made for the evacuation of the Reef must be canceled at once."

The counselors stared in amazement.

"Canceled!" ejaculated Simba. "But—everything is in readiness. The time is doubly propitious. As public sentiment is now, we may anticipate severe criticism for not having acted sooner. And even if that were not so, we should be forced to act by a growing danger inherent in the Reef itself. All our data show that in the near future—two months at the most—it will be near the focus of a major volcanic upheaval, a mere recurrence of forces which have never fully subsided. You know that as well as we."

"I do not know it. On the contrary, I know that these are purely fictitious statements which mask a sinister purpose. Moreover, there is a faction among us—among the young Tritons—which is not yet prepared for freedom. They are self-willed and incorrigible."

"What alien thoughts are these? They are not the thoughts of Vervain," murmured the other counselors.

"These incorrigibles whom you mention—I have spoken with two of them," remarked Simba. "They are behaving quite normally. The mind of youth has teemed always with magnificent schemes. Your alarm is ridiculous."

"You spoke with them?" The voice was charged with anger and astonishment, but Vervain's features betrayed no emotion. "How can that be? The rebels imprisoned themselves in the Dolphin Pool, and within the hour, by means not yet determined, blasted open and escaped through the effluent water duct."

"I salute them!" cried Counselor Chadayana.

"The two in question escaped earlier," explained Simba, "and were picked up by a submersible cruiser. But what is this . . . this sinister purpose of which we are accused?"

"You need not pretend ignorance. I know that you foreseen a world dominated by Tritons and have conceived an ingenious method for our extinction. Your fears are by no means unfounded. It is my intention that the world *shall* be domi-

nated by Tritons, and in turn I shall dominate them!"

Counselor Haldemir exchanged glances with his fellows, and his lips formed the word, "*Insanity!*" He seized the individual telephone before him on the council table and spoke softly but emphatically. Since Simba alone was visible in the Triton Reef receiver, this action was unperceived there.

"Are you not being inconsistent?" inquired Simba persuasively. "You condemn these so-called rebels for their ambitious scheme—their at present impossibly ambitious scheme—of producing a superior race because you fear that it will create antagonism toward the Tritons, and therefore demand that the Tritons continue in their confinement to the Reef. In the next breath you declare that the Tritons *are* a superior race, and reveal an ambition—worthy of a twentieth-century dictator—which will rouse a veritable storm of opposition, and—if it is to be realized—necessarily involves world-wide freedom of movement for every Triton."

"I am capable of handling the situation in my own fashion," was the haughty reply. "The world shall learn to fear its new masters. I have learned that—Cymorpagon has discovered means whereby our geodyne converters can become agents of destruction. You shall have a demonstration very shortly. This volcanic upheaval which you predict—it is true that it will occur, but our converters will be the power behind it and the focus will not be at Triton Reef—unless I so decide. The focus will be eastward of the Reef. The ocean bottom will rise, and the Chilean coast will sink into the sea. Then the world will listen to our terms; if it does not, there shall be further catastrophes. If you attempt to hinder me by force, I shall destroy the Reef."

"Complete mental collapse! Horrible!" whispered the counselors.

"Let us speak with Cymorpagon," requested Simba. "Bring him to the stereophone."

"I am not disposed to be annoyed further by your communications," was the response, "so I am taking steps to make them impossible."

The image leaned forward, reached for an object outside the transmitting field. The right hand and arm disappeared, truncated at the elbow, then reappeared. The hand grasped a device not unlike a pneumatic receiver.

"This is a diatrode gun," Vervain's likeness informed the counselors. "A reconstruction of an old weapon which your educational department was kind enough to furnish our history students, together with similar material. They have difficulty in appreciating the realities of warfare. It emits controlled discharges of globular electricity along a guide parth of ionized air. Like this."

He leveled the weapon—actually at the control panel of his tranmitter but seemingly at one end of the council table. Several counselors crouched involuntarily. A hissing, spectral blue sphere emerged from the muzzle, clung for a moment, grew like an expanding bubble, elongated into an ellipsoid, sprang free—

The image was disrupted in a splash of color, emitted a huge discord as from the shattering of a giant harp.

"It is evident that we have now to deal with a madman," Simba said rapidly. "A madman who harbors ideas of destruction, who has possession of at least one deadly weapon,

who may have already committed we know not what acts of violence and who may commit others. He has destroyed the means of communication. We must gain control of the Triton Reef situation by the speediest possible means. The submersible squadron at Tahiti is not very fast—"

"Yes, yes! I'm ahead of you!" interrupted Haldemir. "Three days and a half at full speed. So I called the liner *Capricorn*. She's due over Rio in thirty minutes. Told her to stand by at altitude forty kilometers to take on whatever men and equipment we decided upon, the divert course to Triton Reef and drop to sea level. I gave her the bearings. We'll take off the whole Triton population at one swoop and bring Vervain back in a specimen bottle. Captain—highly indignant. Never heard of Triton Reef and doesn't want to come down to sea level ahead of schedule. It seems she was about to hang up some kind of a record."

"Excellent!" approved Simba. "And now as to Vervain, poor fellow. He may prove a difficult problem. We must handle him with as little turmoil as possible. Probably he has stirred up too much already. My first thought is of lethegen—lethegen for Vervain."

TO BE CONCLUDED.

IRRESISTIBLE MIST

One of the major dangers of cyclotron and similar atom-smashing work is the irresistible, unstoppable mist—neutrons. The hard, deadly radiations produced—X and gamma rays—can be screened out fairly effectively by lead, thick iron, or a few dozen feet of rock. The most penetrant electrons and alpha particles are stopped dead by a few inches of even so tenuous a form of matter as air. Protons are readily stopped, and once slowed down simply pick up an electron somewhere and relapse to peaceful, harmless existence as a hydrogen atom. Alpha particles, once slowed, are completely inert and innocuous helium atoms.

But neutrons, fast or slow, are still neutrons. A two-foot layer of water is an effective neutron-slower. But the neutron continues to exist as such, and to roam around as a molecule of gas—neutron gas. But this gas has two deadly properties; it penetrates feet of the dense metals with the same casual ease it penetrates ordinary air, wanders through thick concrete and deep water layers with a gentle heat-motion, quite random, but quite certain and persistent. But some atoms do absorb slow neutrons. Uranium isotope 235 does, for instance—with dire results. These slow neutrons are quite apt to wander into a human body and start a violent atomic explosion. It's only a single atom, quite microcosmic in scale, but radioactivity isn't good for human bodies.

All cyclotrons in operation are the centers of a slight fog of drifting neutrons. Further, these neutrons play hob with recording instruments, as well as being dangerous to men. There are so few as to be of but slight danger to the men, fortunately, but the effect on instruments is bad.

Cadmium metal is one of the very few known elements which can stop neutrons completely and safely. Cadmium has a long series of stable isotopes that can be built up by adding neutrons to the lowest members, so drifting neutrons are simply and quietly absorbed, with no detectable result, no radioactivity, and no trouble.

Cadmium is growing popular in cyclotron rooms!

THE MOSAIC

By J. B. Ryan

Illustrated by Orban

History is built event by incident—and each is a brick in its structure. If one small piece should slip—

Far Damascus, Rabî'ul-thânî, 29, 1359

THE contrast between the two men was marked. The host, Abdul ibn Fhaij, was dark of eye and, in spite of his seventy years, still dark of beard. Ismail, the young emir, was blond and blue-eyed, as strong and vigorous as the other was frail.

Yet, notwithstanding these physical differences, a kinship between the two was suggested by the warmth and sincerity with which they greeted one another, each seeking in the countenance of the other the changes of ten years.

While they went through the courteous ceremony prescribed by Moslem etiquette the Emir Ismail

speculated anew concerning the reason behind the invitation that was now a month old. The message from his old teacher had reached him at the city of Five Lakes near the Mississippi the day after the Chinese army from the west had capitulated to the young general who had repelled their invasion of the domains of the Atlantean Caliph, Suleiman III.

But not until his guest was seated upon comfortable cushions, with sweetmeats and tobacco at his elbow, and the silent copper-hued servant dismissed, did Ibn Fhaij approach any explanation of this visit he had requested.

"The years have not altered you, Ismail," he smiled. "You have hardened, yes; but am I right in assuming that the white-hot curiosity that made you my most intelligent scholar still burns within you?"

"You will find me unchanged in spirit, O Master of All Knowledge," said the younger man.

Ibn Fhaij nodded, and began to walk slowly up and down the room as he spoke further: "It was a delight to impart instruction to so receptive a pupil. It had been a hope of mine than when your schooling had ended you would see fit to work with me. You will never know the disappointment I experienced when you abandoned the laboratory to take up the career of a soldier."

"I had to go, Father Abdul," reminded Ismail. "I could not sit by and see the Mongolians invade our country."

"I know, I know," the old man agreed. "But the Chinese menace is ended now. You have smashed their power for years to come. You can return now to the ways of peace. Would you lay aside sword and gun, Ismail, for the test tube and the microscope?"

The eyes of the emir brightened. He arose from his cushions to face the man who had paused before him. "You offer me a great honor, Master," said he. "Upon me has been conferred lately the title of Defender of Western Islam, but it will make me prouder to be known as the colleague of Ibn Fhaij."

For the fame of Abdul ibn Fhaij was world-wide. Europe, Asia, Africa, Atlantea and Maya knew of him. Mathematician, philosopher, scientist and inventor, he had changed that world in his lifetime. The glassed sunlight that illuminated the very room in which he stood was a product of Ibn Fhaij's genius. Because of him the world now had sailless ships and floating iron. He had torn aside the veil of space that clouded the planets. He—

Ibn Fhaij smiled through his beard. "Then we shall go to work at once." He clapped his hands. "You will find me a hard taskmaster, Ismail." The Algonquin slave appeared in the doorway. "Prepare the laboratory, Ayoub," ordered Ibn Fhaij.

ABDUL IBN FHAIJ linked his arm with that of the emir and they followed the servant from the room. The laboratory of Ibn Fhaij was the most complete in all the world. A veritable forest of scientific paraphernalia met the gaze of Ismail. Glass and metal vats stood on the floor, and curved retorts were everywhere. Telescope, microscope and delicate measuring instruments had their place.

The servant Ayoub was already at work, placing a white rabbit on a long marble slab. He held the timid creature while Ibn Fhaij produced a hypodermic syringe and pressed it against the spine of the animal. The Algonquin removed his hands, but

the rabbit remained quiescent upon the slab.

Ismail was all attention now. The young commander of the armies of Atlantea was the student once again. He watched carefully as Ayoub slid two steel-bright machines up to the slab, and Ibn Fhaij smothered a pleased grin as he observed that interest. His own had come back to him.

The machines were mounted with what seemed tiny cannons, and their muzzles were trained upon the passive rabbit. Ibn Fhaij placed one of his slim dark hands on a lever, then turned to Ismail.

"This is perhaps my greatest achievement," he remarked. "I am, I believe, about to send this creature into the fourth dimension."

"The fourth dimension!" The emir caught his breath. "You have solved the riddle of Time?"

"According to my calculations, yes," nodded Ibn Fhaij. "You are familiar, of course, with the theory that Time is constant, that the Past, Present and Future are tangible things that only our limited senses prevent us from exploring and traveling at will." His fingers moved, there came a faint click and from the mouths of the silver guns appeared two black pencils of some substance that resembled carbon.

There was no further sound. There was no odor, nor was there anything to be seen. Yet a terrific energy had been loosed, strange forces were at work, powerful, invisible rays beat down upon the white rabbit.

And then the white coat of the rabbit became tinged with gray. This grayness spread and the texture of the animal's fur became blurred, taking on the quality of melting wax. The long ears drooped back and blended with the amorphous body. The grayness thinned like dissipating smoke and then, with a shock, Ismail realized that he was staring at the empty slab. The rabbit had vanished.

Ibn Fhaij clicked the lever. Ismail passed his hand over the spot where the rabbit had been and encountered only emptiness.

"The rabbit has gone into Yesterday," said Ibn Fhaij. "I have sent it back fifty years."

The voice of Emir Ismail was shaky. "You are truly a worker of miracles, Ibn Fhaij! If we can explore Time, all knowledge lies open to us."

"Not so fast," Ismail." The old scientist lifted a hand. "This machine is far from perfect. There is still something that baffles me. That is why I have sent for you, the one man with the mentality to grapple with the problem. I need your help. Watch carefully, while I attempt to bring the rabbit back."

THE BLACK cartridges in the guns were removed and red pellets inserted. Once more the machine was set in operation. They studied the slab as the red pencils were consumed slowly. But no form materialized upon the marble table. After ten minutes, Ibn Fhaij shut off the power.

"You see?" He gestured resignedly. "There was no reason why that rabbit should not have returned. That is the sixth animal I have sent out into Time, and the third time I have failed to bring them back. Where is that rabbit now? Is this an annihilator instead of a Time-traveler? Am I as apt to disintegrate a body as to send it to some specific spot on the Time-belt?"

"But you did bring back three animals?"

Ibn Fhaij nodded. "However, one of the bodies was nothing but a man-

gled heap of flesh and bones."

Ismail laughed reassuringly. "Your fears are groundless, Master. After all, the creatures you send into the Past are subject to the same perils that menace them in the Present. The beasts of prey that stalk through Yesterday are quite capable of relishing a rabbit of Today."

"That could be the explanation." Ibn Fhaij's gloom lessened at the suggestion. "For I cannot see where I made a miscalculation in constructing this Time Machine."

"Your faith is my faith, Ibn Fhaij," said the emir. "And to prove it I am willing to place myself in the machine."

Ibn Fhaij caught his breath, and it was a moment before he could speak. When he did so, there was a tremor in his voice. "No . . . no, Ismail, my son. If one of us must go, let it be me."

"There must be no sentiment between us, Master. We must approach this problem with scientific detachment. You, the inventor, are more familiar with this machine and should be the one to operate it. And if there is any danger attached to a trip through Time, it is I, the younger man and the hardened soldier, who would be the better equipped to cope with it."

"You are right, of course," Ibn Fhaij agreed soberly. "But—"

The emir's answer to the protestations was not words but action. He cast his black silk robe from him and stepped up on the marble table. "Restore the black cartridges, Ayoub," he commanded, as he stretched his long body out on the cool slab. "By the beard of Mohammed, this is a greater adventure than facing the hosts of New Khitan."

On the face of Ibn Fhaij was a mingling of reluctance and eagerness. A human reluctance against sending his favorite pupil into possible harm, and a scientific eagerness to have his theories proved.

Ismail smiled. "Be not hesitant, Master. I am quite determined to be the first man to journey into Time."

"Where would you like to be sent, O Bravest of All Men?"

Lying on the slab with the guns of oblivion pointed at him, the emir considered, his mind touching the highlights of history. Khufu and the Pyramids—Greece—Hannibal and the Romans — Cæsar — Attila — Buddha—Mohammed—Hussayn the Great—the long Slavic War—the discovery of the Western Hemisphere by Whu-sun—the landing of the Moslems on the eastern shore a hundred years later—

"Suppose we say a thousand years," he suggested casually. "But must it be Atlantea? This continent was inhabited at that time solely by red-skinned nomads. Can you span the ocean also and set me down in Europe?"

"Three thousand miles and a thousand years." Ibn Fhaij smiled. "It can be done, Ismail." The elder man's face was pale and tense as he adjusted several dials on the Time Machine, studying them carefully the while.

"Everything is in readiness," he announced at length and stepped as close to the recumbent emir as the slab would permit. In his hand were two timepieces, one or which he extended to Ismail. "Take this with you, my son. These watches, perfectly synchronized, are to be our only link in the measureless void that will presently separate us. Now, mark well what I say: There will be an instant of oblivion when you pass from this age into another. When you regain consciousness, take careful note of the exact spot on which you find yourself. You must

be in that same position if I am ever to bring you back into Today. Twice in a day and a night, or every time these watches register the hour of twelve, I shall set this machine in motion to accomplish your return. Stay as long as you like. When you are ready to come back, assume the proper position just before the stroke of twelve and leave the rest to me."

"I understand," said the emir, and pocketed the compact golden chronometer. Then he extended his hand. Ibn Fhaij clasped it quickly and tightly. "Allah guard you," he whispered.

Then he stepped back, moved his arm and clicked the lever of the Time Machine.

THE EMIR was conscious of no discomfort nor any untoward sensation. Only the curling tips of the black pencils and the strained face of Ibn Fhaij told him that his greatest adventure had begun. The soundless, unseen rays produced no pain whatever. Indeed, he was more comfortable than before. The feel of the hard mable under his back fell away to be replaced by a cushion as light as air, and all weight seemed to leave his limbs.

This sense of floating created a faint dizziness and the light of the laboratory flickered and dimmed. He blinked his eyes to clear his vision. The nebulous shadows vanished with the action, and he turned his head toward Ibn Fhaij.

For a moment he stared in astonishment, then jerked himself to a sitting position. Ibn Fhaij had vanished. Gone, too, was the servant Ayoub. Gone was the laboratory and gone, also, was the entire teeming city of Far Damascus, the island on which it stood and the two rivers that flanked it. Ismail, the emir, lay, not on the marble table, but on a greensward with tall trees on all sides of him.

He was stunned with amazement. Had he accomplished the transit of Time as simply as that, in far less than the twinkling of an eye? It seemed unreal, impossible, yet how else could he account for his presence in this strange forest?

He was about to scramble to his feet when he remembered the last warning of Ibn Fhaij. He would be stranded in this stretch of Time if he moved without marking his seat so he could find and resume it without question. He gazed about, seeking landmarks, and noted for the first time that he was not alone in these woods.

A party of men, five in number, were halted a few yards distant, blinking at him in wonder. The emir returned their stares with interest, for these should be Europeans of a thousand years before his time.

They were tall and powerful men, clad in garments of coarse-woven cloth and leather harness decked with bits of protective metal. They were armed with swords and pointed knives. All were bearded and long-haired, but their hair was varied in color. Two of the men were yellow-haired, two others were dark, and the fifth was a freckled redhead.

Ismail knitted his brows in perplexity. Was this the year 359, the fabulous days of Hussayn the Great, when all of Europe, North Africa and half of Asia was one united Moslem empire? These men were dirty and unkempt and their weapons, which resembled those of imperial Rome, were reminiscent of an earlier day. Had Ibn Fhaij erred? Was Ismail a castaway in the void of Time?

"Would you, good people, mind telling me where I am?"

He delivered the query in Arabic, and instantly an excited clamor arose

among the five. For a moment their speech was unintelligible to the emir, but he finally caught several words that conveyed meaning. That strange gibberish was sprinkled with Latin, the long extinct language of the Cæsars.

"He is a paynim!" cried the freckled redhead, and swords and daggers flashed in the sun as they rushed upon the seated stranger. Ismail rolled aside from the stabbing steel and jerked at the pistol in his belt. But the gun flew from his grasp as they pounced upon his squirming figure.

Pinned to the earth and unable to move under their combined weights, the emir waited for death. But no blade was plunged between his shoulders. Instead, the voices of his captors jabbered in argument above him. The prisoner gathered enough of the queer Latin to understand that one individual was counseling that he, an undoubtedly Saracen spy, be taken alive to someone whom they referred to as their leader.

Saracen! Another long dead word out of the past! At the beginning of Islam, the word had been an infidel term for all Mohammedans, but the word had died out long before the time of the magnificent Hussayn.

ISMAIL was hauled to his feet and his arms tied behind him. The short swords prodded him into motion. He obeyed willingly, following the man ahead as they marched through the trees. Presently a faint path was reached and into it the squad turned.

The emir called upon the Latin he had studied as a boy. "What year is this?" he asked, speaking to the blond giant whose arguments had saved his life for the time being.

The question had to be repeated before an answer was obtained. "This is the Year of Our Lord, 732," said the yellow-haired man.

732—the emir's heart sank. Ibn Fhaij had fallen woefully short of the mark—missing it by almost five hundred years. Then a phrase used by his informant arose to give him pause—*Anno Domini*—those were words used by the ancient Christians, the adherents of the religion prevalent in Europe prior to the rise of Islam. Ismail racked his brains for what he could recall of that extinct sect. Their symbol had been a Cross—

Were these men Christians? Was 732 a Christian year? The captive emir made a mental calculation. 732 A. D. would be roughly equivalent to the Mosler year of 110. Ibn Fhaij had not undershot his goal. On the contrary, he had sent Ismail over two hundred years farther into Time than he had intended.

"And what is the name of your country?"

"What manner of man are you?" Yellow Hair eyed his questioner. "Your Latin is peculiar, you know not the date, and now you ask where you are. This is Aquitania, a part of the Frankish kingdom."

Gaul in the year 110. He had landed in the midst of the great war between the Crescent and the Cross for the possession of Europe. Even now, as he remembered his history of those days, the Moslems were pouring through the Pyrennes to begin the march that was to carry them to the tip of Scandinavia.

Proof of this surmise was forthcoming when the little band of men emerged from the woods and topped a rise that furnished a view of the level countryside. A river wound its way through the terrain and lost itself among the trees they had just quitted. In the distance Ismail described what at first glance ap-

peared to be a sprawling city, but which his trained eye quickly recognized as the tents and housings of a vast horde of men. He had guessed aright at his place in Time. Frank and Celt and Roman were gathering on the plains of Gaul to challenge the advance of Islam from the south.

A horseman detached himself from the camp and rode to meet the returning men. Securing the information that the scouts were returning with a prisoner the rider wheeled and galloped back to spread the news. When Ismail and his escort reached the outskirts of the army, soldiers were grouping to curse and revile the captive.

A handful of offal sailed through the air and spattered itself against the chest of the emir. The press of men became so great that the guards and the captive were brought to a standstill. Rough hands plucked at the sleeve of the bound man, and it is probable that Ismail would have been mobbed to death had not the hostile crowd been halted by a stern voice from the rear. The milling ranks parted and a tall dark-faced man strode toward the center of the disturbance.

He was gaunt, thin-lipped and hook-nosed. His coal-black eyes swept arrogantly over the prisoner. "What have we here?" he demanded.

"A Saracen spy whom we caught sleeping in the woods, Duke Martin."

The dark eyes studied the emir sharply. "You are a spy?"

Ismail shook his head. "I have never been in Andalusia. I am a traveler from a far land, and I ask of you only the courtesy due to any visiting, friendly stranger."

"He addressed us in the tongue of the paynim," charged one of the guards.

"That was only because I did not know in what part of Europe I had landed. It was only by chance that I spoke in Arabic first."

The dark duke sneered his disbelief. "A likely story," he scoffed. He raised his eyes to a solitary tree that stood on the edge of the crowd. "Throw a rope over one of those limbs and hang him," he ordered brutally. "Paynim or no, we'll be on the safe side by getting rid of him."

A roar of approval greeted the command of the duke. Ismail was hustled forward with such violence that he lost his footing, fell and was dragged toward the tree. He was then jerked to his feet and a rope looped about his neck.

Bruised and dazed, he did not hear the greater commotion that cut through the tumult about him, nor did he see the racing horseman that split the mob as a hand displaces air. The rope was tightening about the throat of Ismail as the horse swept past the tree. A sword sang through the air, severing the rope about his head.

The would-be executioners scattered with cries of dismay and left a space for the rider to turn his steed and return to the side of the man now standing alone under the tree.

"What is this?" the man on horseback demanded angrily, surveying the silent throng about him. "Who gives the orders for any death when my back is turned?"

No one answered him. But a section of the crowd fell away, exposing Duke Martin to the view of the rider. The dark man stepped forward and inclined his head slightly. "It was I, Duke Charles, who ordered the hanging. This man is a Saracen spy."

The voice of the man called Duke Charles hardened like steel. "You

seem to forget, Martin the Proud, that it is I who am in command here. Charles Martel still makes the decisions."

The head of Duke Martin went lower, and color touched his dark cheeks. "I shall not forget again," he murmured servilely. But there was a hate in his eyes when he lifted his head as the mounted duke turned away.

Duke Charles sheathed his sword and his glance fell upon the silent emir. His eyes widened slightly as they took in the habiliments prepared by workmen with a thousand years' additional skill than those of his time. "Unbind this man," he said crisply. "Tend his hurts and have him brought before me."

With that he rode away. Out of the ranks of the chastened soldiers stepped two of the men who had taken Ismail prisoner. The emir's arms were freed and he was conducted to a tent where his bruises were washed and the dirt removed from his garments.

Ismail, the emir, could almost name the exact hour and day into which the Time Machine had deposited him. This was the eve of the great battle of Tours in which the followers of the Prophet were to annihilate the army of the Franks. Already he had met two of the leading figures of that world-shaking event. Charles Martel, the Mayor of the Palace, was the uncrowned king of the Franks. The weak Merovingian king had little to say in the presence of Charles the Hammer.

And the other, Duke Martin the Proud, was the man destined to lead this last army of Christianity to the crushing and disastrous defeat that was to leave Europe helpless before the men from Arabia. Ismail could have informed that arrogant duke that in a few days his head would be carried through the streets of Tours on the point of Saracen spear.

Much refreshed by his ablutions, Ismail was escorted through the bustling camp to the stone building that was the temporary headquarters of the Mayor of the Palace. He found Charles Martel seated on a couch in a small room, conversing with a scholarly-looking man clad in a dark gown and who wore about his neck a thin, bead-studded chain from which dangled a silver crucifix. Lighted candles brightened the room, for by now the day had passed through twilight and on into night. A wolflike hound lay upon a bed of rushes at the feet of Duke Charles.

"This is Father Louis," the duke introduced the Christian priest after dismissing Ismail's attendants and had made his visitor welcome. Both the churchman and the Frankish leader were studying the stranger with undisguised interest. And Ismail himself found much to admire in this forceful man who had made himself the ruler of a nation. And here, too, the man who could look back upon recorded history could have whispered a warning. The days of Charles the Hammer were numbered. Indeed, with the battle of Tours imminent, those days must have dwindled to hours. Duke Charles was never to direct the men now under his command. He was fated to die under an assassin's knife before the hosts of Christian and Moslem shocked together.

"You wear a strange garb, O stranger," said Charles Martel, "and the cut of your hair is unlike any I have seen. It has been reported to me that you claim to come from a distant country. I cannot imagine where it could be."

"I come from a land far to the westward."

"West of Gaul? You mean Brisain? Hibernia?"

"Beyond Hibernia," said the emir.

The duke lifted his brows, and glanced questioningly at the priest. "You know more of manuscripts than I, father. Could that be so?"

Father Louis looked uncomfortable and cleared his throat. "Plato, the pagan philosopher, made some mention of land beyond the Pillars of Hercules—a country called Atlantis." He peered at the emir. "Is that where you are from, Ishmael?"

"Yes," nodded Ismail. "Only we call our land Atlantea." No need to explain to these people of a thousand years ago that Atlantis was a fabled continent supposedly sunk beneath the ocean, nor to strain their credulity with the statement that the earth was round and that continents greater in area that Europe lay to the westward.

The duke leaned forward. "How come you to know Arabic and Latin?"

"There was contact between Atlantis and the Mediterranean lands in the old days," the emir answered easily. "Time has obscured the past, but legend has it that civilization came to Egypt and Greece by way of Atlantis."

Father Louis inclined his head in agreement, and the explanation seemingly satisfied the duke. A welcome respite from further questioning was granted Ismail when servants entered with trays bearing the evening meal of Charles Martel. The Frankish leader insisted that the stranger dine with the priest and himself.

When the meal had ended, Duke Charles announced that he and Father Louis would have to leave, to attend a gathering of various chieftains, where the plan of the approaching battle would be discussed.

"You are my guest, O Prince of the West," said the duke. "You are free to come and go in all of Gaul that recognizes my authority. However"—and here he unbuckled the scabbarded sword from about his waist—"no man should go unarmed in this semibarbarous land. Take this, the blade of Charles the Hammer, and use it as I would, should anyone molest you."

Ismail, the emir, accepted the weapon, thankful for the feel of steel in his hand after the loss of his pistol in the woods. Father Louis, curious to learn more of the land beyond the Great Sea, would have passed up the conclave of the Frankish allies, but the emir forestalled that by pleading an exceeding weariness. "I have traveled far to reach Europe."

A servant was summoned and, with lighted candle, led the guest of

Duke Charles to a secluded room in a wing of the building. Left alone, the emir extinguished the candle and stretched himself upon the couch provided him.

IT WAS a strange and primitive world, this Europe into which he had been hurtled, with its mixture of barbarous Teuton and the remnants of the shattered Roman civilization. He liked the Mayor of the Palace, for like Ismail, Duke Charles was a soldier, a leader of men. How long, debated the emir as he lay in the darkened room, should he remain in Gaul? It would not be long until midnight, the hour when, if he would return to Far Damascus this night, he must be at the place where the Time Machine had deposited him. But could he find his way through the tree-darkened forest? Would it not be better to wait and seek the spot at noon, under daylight—

He awoke with a start. Only then did he realize that he had dropped off to sleep. How long he had slumbered he had no way of telling, for the hands of his timepiece were undistinguishable in the night-filled room. The house was dark and still. What, then, had awakened him?

It came again, a faint tinkling sound, the scrape of metal against stone. A whispered hiss of warning followed and the original quiet of the chamber was restored.

Silently the emir lifted himself up on one elbow. Moonlight streamed through the room's one glassless window. By the silvery radiance Ismail assured himself that there was no intruder in his sleeping quarters. But that rattling sound had been furtive, and the voices pitched to a cautious whisper.

The bare feet of the emir touched the floor and his fingers closed about the hilt of the sword presented him by Duke Charles. Slowly, soundlessly, he crossed the room. He neared the window like a shadow and peered out into the triangular yard.

Three men were grouped together on the gound just below him. They were in the shadows, but the moonlight was strong enough for Ismail to recognize one of them as Martin the Proud, the ducal rival of Charles Martel. The heads of the three were bent as they studied a barred door that had withstood their stealthy efforts to open it.

Somehow, the scene did not occasion Ismail any surprise. Indeed, there was a familiarity about it that puzzled him for a brief moment. Then he found himself nodding his head. History had hinted at this, but the contention had never been proven. The death of Charles Martel had never been explained satisfactorily, but the answer lay now before the eyes of Ismail. These were the assassins of Duke Charles seeking entrance to the quarters of their intended victim.

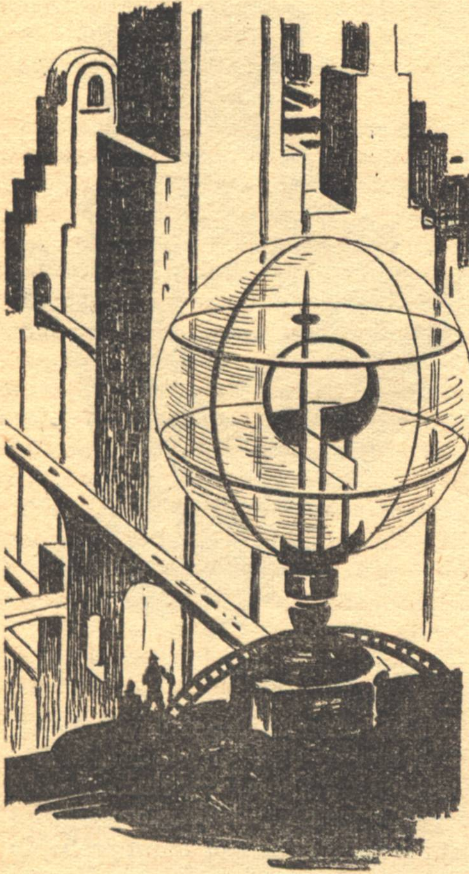
Charles Martel had saved the life of Ismail, and had placed the wanderer under his protection. Moreover, the emir had partaken of the bread of Duke Charles—a prime consideration in the minds of all Moslems in all the ages—and was even now sheltered under his roof. And Ismail had no love for the sneering, cruel Duke Martin. Ismail placed a hand on the window sill and vaulted over the low obstruction.

NOT UNTIL his feet touched the ground did he make any sound. The trio whirled with startled grunts at the sudden appearance of his figure beside them. Sword and knives swished from leather sheaths as the men in the shadows backed against the stone wall of the building.

"Good evening, Duke Martin,"

smiled Ismail. "Isn't this rather odd —this creeping and whispering at such a dark hour in the rear of the home of your brother duke?"

"It is the infidel!" Martin the Proud laughed relievedly and advanced a pace. "What right have you, Saracen, to question honest Christians?"



"I question, not honest men, but murderers."

The smirk vanished from the duke's face. "What do you mean?"

"I know," said Ismail, "that you are about to steal into this house to plunge your daggers and swords into the heart of the sleeping Duke Charles."

A moment of silence followed that accusing declaration. Then an oath spewed from the lips of Duke Martin. Moonlight flickered on his moving sword as his body lunged forward.

The sword of the emir flew up in defense and the blades met in a shower of sparks. "Henry! Benedict!" snarled the duke. Silence this devil, and do it quickly, or we are undone!"

This was a fight to the death. Realizing his danger, Ismail leaped to one side of Duke Martin, toward the building and smote one of the duke's confederates before that worthy could stir from his tracks.

The fellow dropped without a sound and Ismail pivoted to engage the duke once more. The swords gleamed in and out like dim lightning on the gloom, and the duke's surviving follower circled the dancing, shifting figures in an effort to get behind Ismail with his knife.

Ismail moved ever out of the reach of that menace, then stopped suddenly and reversed his course, risking a blow from Duke Martin for one savage cut at the slinking jackal on his flank. The man's own momentum and slow wits carried him into the sweeping blade that knocked the dagger from his grasp and cut on through leather and flesh and bone.

This elimination of the odds had its price, however. The sword of Martin the Proud sank deep into the momentarily unprotected side of the emir. Blood flowed darkly in the moonlight as the freed sword of Ismail drove the duke back.

That retreat Duke Martin could not check. On the defensive up to now, the weapon of the emir became a thing of terror, moving with a terrific speed that the guard of the duke was unable to withstand.

Duke Martin lived long enough to

reach the wall of the house. And there, halted by the unyielding stones at his back, he stood and was powerless to stop the steel that dived over his arm and into his heart.

And thus, at the very moment when he should have died at the hand of Martin the Proud, Charles the Hammer was leaving the house to lead the hosts of Christendom against the Mohammedan invaders. This Ismail did not see, for Duke Charles was making his exit on the other side of the building. But he would not have seen even if the man he had saved had stepped into the backyard into the very arena of combat.

For Ismail was gone. There was no hand to hold or withdraw the sword as Duke Martin slid down the wall to huddle in a heap on the ground. For, on the instant that the heart of Duke Martin was transfixed, Ismail vanished, disappearing with all the suddenness of a bursting bubble. And with him into nothingness, across the gulf of Time, went Abdul ibn Fhaij, the city of Far Damascus, all the transatlantic Moslems, leaving in their place—

New York, June 4, 1940

"I SEE where Archduke Otto is still hopeful of obtaining the throne of Hungary," observed young Robert Moulton as he laid down his newspaper. "I wish him luck," he added, picking up a pipe from the stand at his elbow and filling it with tobacco.

Professor McLeod, on the other side of the reading lamp, lifted his eyebrows inquiringly over the rim of the ponderous volume in his hands.

Young Moulton grinned. "I have always sympathized with the forlorn hopes and the lost causes of history. Bonnie Prince Charlie was one of the heroes of my schooldays. And Harold, the Saxon king! How I wanted him to win over the Duke of Normandy. I remember I used to dream how, if I had a Time Machine I could go back to 1066 and tell King

Harold how to win the Battle of Hastings."

The professor cleared his throat. "That would have been too bad for you—and me," he remarked dryly. "You know, if Harold had triumphed at Hastings, you and I and probably no one else in America or Europe would be alive today. The Past, my young friend, is a closely interrelated mosaic, and to remove any of the bits anywhere changes the shape and pattern of all the subsequent pieces. If the Normans had not overrun the British Isles, our ancestry would have followed different lines. If the Normans had remained in France, we would have had other Frenchmen in place of the ones that actually were and are being born." He lifted the book again.

IN TIMES TO COME

Lester del Rey, absent some months now, is back in the August issue with "The Stars Look Down"—a story of two strong men, with two strong wills and stubborn ideas. One thing both agreed in absolutely—the stars must be reached, space must be crossed. But one swore by all that was that chemical fuels and only chemical fuels could be the answer, and the other was quietly, but equally, determined that atomic power and that alone could answer. It's a fight of wills and methods—and a swell yarn. They fought with determination—and no holds barred!

Second novelette of August's issue will be "Vault of the Beast," by A. E. van Vogt. It's based on another variation of the themes of the malleable monster, the thing that can change form. It makes a nice, uncomfortable yarn, and makes ten thousand words race along like five thousand.

Which reminds me, incidentally, that A. E. van Vogt has a new serial coming up after "Crisis in Utopia," which ends in the August issue. Van Vogt's new one will be "Slan!"—the tale of a superman, but of a type never before attempted. You've probably already discovered that human authors can't tell the story of the superhuman. It's a contradiction in terms. To give the philosophy and motivation of a being completely superior is by basic definition impossible. A point on which supermen stories fail, leaving the reader with a vague sense of unreality and dissatisfaction.

Van Vogt, in his handling, neatly and completely avoids the contradiction. It's done by a subterfuge—by a trick—admittedly. But it's a trick that, by its nature, is both necessary and completely successful. The result is a story of a superman with a reality and swing that gives his tale more punch than any effort along this line I've seen in a lifetime of specialization in science-fiction.

The Editor.

ANALYTICAL LABORATORY

We are limited for space this month. The standing of the stories was as follows—and it was a close race:

1. "Rim of the Deep," by Clifford D. Simak
2. "Final Blackout," by L. Ron Hubbard
3. "Hindsight," by Jack Williamson
4. "Space Guards," by Phil Nowlan
5. "The Long Winter," by Raymond Z. Gallun.

The Editor.

EMERGENCY LANDING

By Ralph Williams

Illustrated by Schneeman

The USN 1156 landed at an emergency landing field. They were out of fuel. But the fuel they wanted was water, and not for propeller-spinning engines—

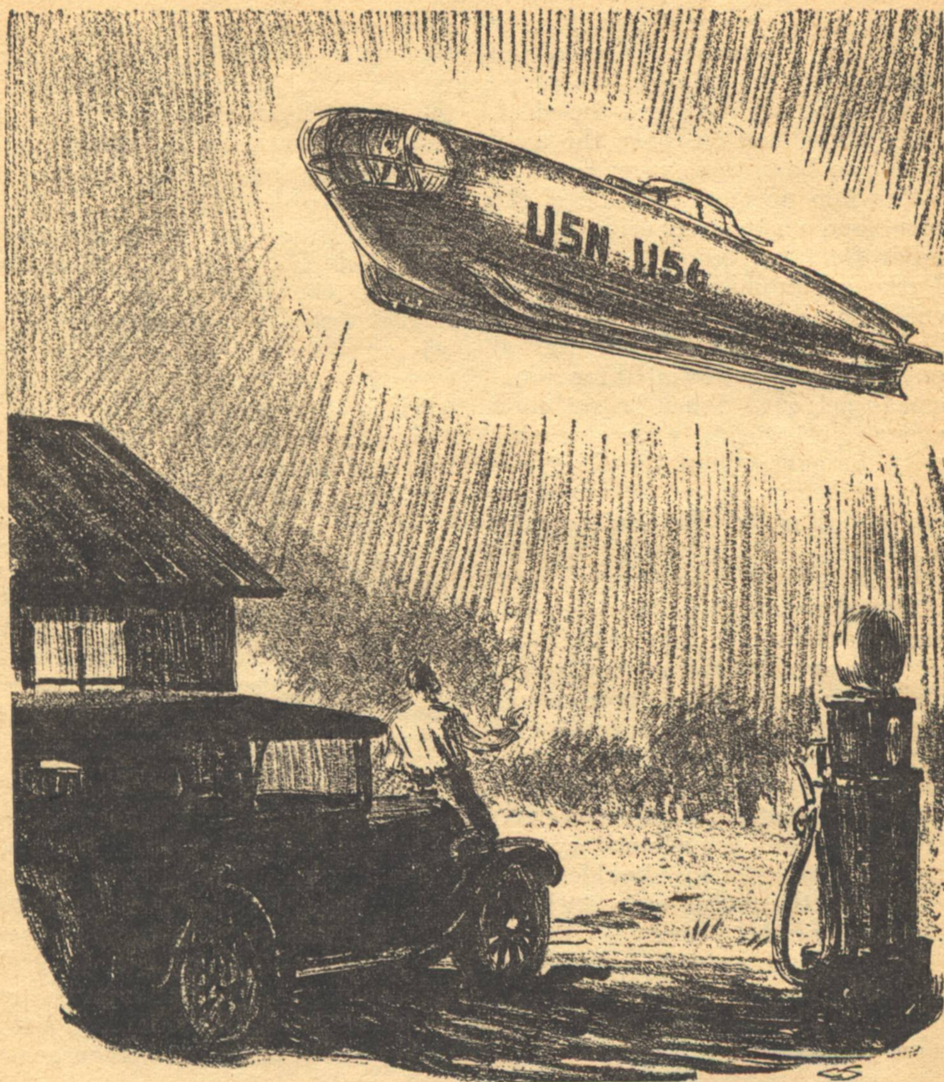
THE funny part about this is that Burke was perfectly sober. Not that he is in the habit of coming on watch drunk, but then it just isn't the sort of thing that happens to a sober person. I had the evening watch that day, and when he relieved me at midnight he was absolutely normal.

When I left he was settling down in the chief's chair with a detective story magazine. The CAA frowns on that—the magazine, I mean, not the chief's chair—but most of us do read on duty, especially on the midwatch, because ordinarily there is nothing to do at an intermediate landing field between midnight and eight but get out the weather once an hour, and reading is about the only way to keep from getting sleepy. But once in a while things do happen, which is why they keep a twenty-four-hour watch at these places.

It must have been around one twenty that things began to happen on this night. About that time Burke glanced up at the clock and decided it was time to start taking his weather—a job that wasn't likely to prove very interesting, since conditions had been "ceiling and visibility unlimited" all evening, and the forecasts stubbornly maintained that they would continue so—so he put aside his magazine and stepped outside to read the thermometers. It was while he was spinning the psychrometer crank and gazing around the sky for signs of cloudiness that he saw this plane coming in.

When he first saw it, he says, it was just a dot of light sliding slowly down the sky toward the field. The first thing that struck him as queer about this ship was that he couldn't hear the engines, even though it couldn't have been over half a mile from the west boundary. It seemed to be gliding in, which was a very silly thing to do with nothing but the boundary lights and beacon to guide by. Another thing, it was strange that any plane at all would be landing here after dark, in good weather, since there was none based at our field, and it was only about once in a blue moon that we had a visitor. Burke wondered about that, but then he remembered that he had to get his weather in the sequence, so he ran inside and put it on the wire.

By the time he could get to the window for another look, the stranger was just landing. He could see it more plainly now in the flashes from the beacon, and if it was a plane, it was like none he'd ever seen or even heard of. It looked more like an airship—only not like an airship either. This may sound silly, but Burke says if you can imagine a flying submarine, that is



just what it looked like, and he should know, being ex-navy. He says it reminded him of the old gag the recruit instructors like to pull: If you were on guard and saw a battleship steaming across the parade ground, what would you do? It even had *U. S. Navy 1156* painted on its side in big black letters.

There was still no sound from the engines, but there was a faint blue exhaust from somewhere around its tail, and it was plain that the ship was under control—that is, if it really was there, and not just Burke's sins beginning to catch up with him. When it was about thirty yards from the watch house, this exhaust stopped, and it settled gently to the ground on two broad skis that ran the length of the ship. It drifted down like a feather, but when the weight came on those skis they sank a good three inches into the unsurfaced runway. Burke be-

gan to wonder about secret navy inventions, stratosphere planes, and stuff like that. Also he wondered whether he ought to call the chief, and decided not to, since the chief is apt to be cranky when someone wakes him up in the middle of the night and makes him drive the six miles from his home to the field. Burke compromised by making an entry in the log that *Navy 1156* had landed at 0141. Then he walked out to the ship and waited for someone to get out. When he got close enough, just to satisfy his own curiosity, he gave one of the ski struts a good hearty kick. It was solid enough, all right. He almost broke his toe.

THERE WAS a glassed-in compartment in the upper part of the nose that looked like the control room, and through the glass Burke could see someone in a blue coverall and flight cap fussing with some instruments. He was so busy watching this fellow that he didn't notice the door open behind him until a voice spoke almost over his shoulder.

"Hey," the voice said, "what's the name of this place?"

Burke spun around and looked up at an open door in the side of the ship and another man in the same blue coverall and flight cap. This one wore a web pistol belt, though, and a funny, bulky-looking pistol in the holster. He had a lieutenant's stripes on his shoulder and Burke automatically highballed him.

"Parker, sir," he answered, "Parker, North Dakota."

The lieutenant turned and relayed this information to someone back in the ship. Then he and Burke stared at each other. Burke was on the point of mustering up courage to ask what the score was when another man came into view. This was the one who had been in the control room, and Burke saw that he was a commander. He, too, stared curiously at Burke.

"Can we get some water here?" he asked.

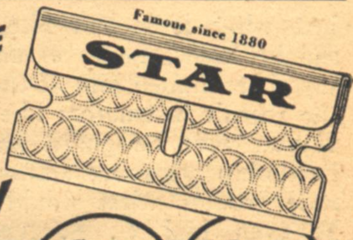
"Sure." Burke indicated the pump, visible in the light from the open watch-house door. "Right over there."

The lieutenant eyed the pump doubtfully. "We might get it out of there in about a week," he said.

The commander jumped. "A week! My God, man, we have a mission to perform. We can't stay around here for a week. We have to be out by morning."

"Yes, sir, I know, but we're going to need a lot of water. Those Jennies will suck it up like a thousand-

TRY THE STAR WAY TO SHAVE!



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horse centrifugal when we hit that warp, or whatever it is."

"About how much?"

The lieutenant pulled a cigarette out of his pocket and lit it thoughtfully. "Well, we're almost dry now, and we'll need every drop we can carry. At least twenty-five thousand gallons."

The commander turned back to Burke. "How about it?" he demanded. "Can we get that much water around here?"

Burke mentally pictured a five-hundred-gallon tank, multiplied by fifty. That was a lot of water. He found himself agreeing with the lieutenant that it would be hardly feasible to get it out of the watch-house well, if a person was in a hurry.

"There's the river," he said, "but it'd be kind of hard to find in the dark."

"Never mind that. We'll pick it up in the visors. Which way?"

"South," Burke told him. "About five miles."

"Thanks."

For an instant longer they stared sharply at him, as if fascinated by his appearance, and he in turn began to realize that there was something obscurely alien about these people —nothing definite, just a hint of difference in the way they handled their words, a certain smooth precision in their movements. It made him vaguely uneasy, and he felt a distinct sense of relief when the commander turned and spoke to the lieutenant.

"Come on," he said. "Let's get her up."

The two officers disappeared into the ship. A seaman stepped into view and threw a switch and the door began silently to close. Burke suddenly remembered there were questions he wanted to ask.

"Hey," he shouted. "Wait a minute."

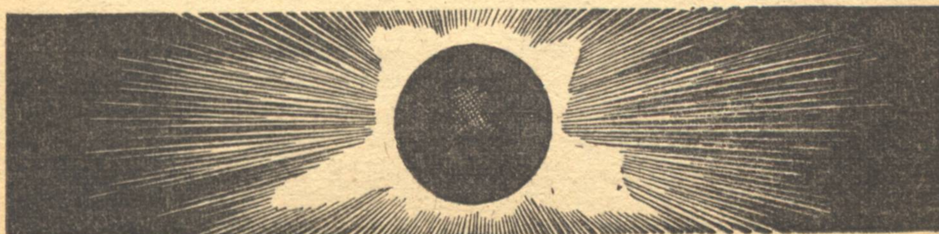
The door slid open a foot and the seaman's head popped out. "Stand clear," he warned. "If you're caught in the field when we start to go up, you'll go with us."

Before Burke could open his mouth to speak the face disappeared and the door closed again. Burke prudently retired to the watch-house porch.

Presently the ship lifted into the air, the exhaust flared out softly, and she spun on her tail and headed southward. Burke watched until the blue glow had faded out into the starry sky, then went inside and looked thoughtfully at the log. There are no regulations covering the landing of submarines at intermediate fields, and the CAA does not approve of unorthodox use of its facilities.

Finally he came to a decision and sat down to the typewriter.

"0152," he wrote. "*Navy 1156 took off.*"



COVENTRY

By Robert Heinlein

Illustrated by Orban

A story of two worlds; one where a man could choose his life—and the other, where any man could take another's life! A sequel to "If This Goes On—"

"HAVE you anything to say before sentence is pronounced on you?" The mild eyes of the senior judge studied the face of the accused. His sympathetic regard was answered by a sullen silence.

"Very well—the jury has determined the fact that you have violated a basic custom agreed to under the Covenant, and that through that act did damage another free citizen. It is the opinion of the jury and of the court that you did so knowingly, and aware of the probability of damage to a free citizen. Therefore you are sentenced to choose between the Two Alternatives."

A trained observer might have detected a momentary trace of dismay breaking through the mask of stoical indifference with which the young man had faced his trial. Dismay at the sentence was unreasonable; in view of his offense, the sentence was inevitable—but reasonable men do not receive the sentence.

After waiting a decent interval, the judge turned to the bailiff. "Take him away."

Before that official could reach him he stood up, knocking over his chair with the violence of his movement. He glared wildly around at the little company assembled about the long table and burst into speech.

"Hold on!" he cried. "I've got something to say first!" In spite of his rough manner there was about him, somehow, the noble dignity of a strong and untamed beast at bay. He stared at those around him, breathing heavily, as if they were, in fact, a circle of hunting dogs waiting to drag him down.

"Well?" he demanded. "Well? Do I get to talk or don't I? It'd be the best joke of this whole damned comedy if a condemned man couldn't speak his mind at the last!"

"You may speak," the senior judge told him in the same even, unhurried tones with which he had pronounced sentence, "David MacKinnon, as long as you like, and in any manner that you like. There is no limit to that freedom, even for those who have broken the Covenant. Please speak into the recorder."

MacKinnon glanced with distaste at the tiny microphone hanging near his face. The knowledge that any word spoken in its range would be broken down into typed phonetic symbols by a recording voder somewhere in the Hall of Archives inhibited his speech. "I don't ask for records," he snapped.

"But we must have them," the judge replied patiently, "in order that others may determine whether or not we have dealt with you fairly, and according to the Covenant. Oblige us, please."

"If you want to return, signal at the booth on the other side of the Barrier —but be prepared to change your personality," the guard called after him.

"Oh, very well!" He ungraciously conceded the requirement and directed his voice toward the instrument. "There's no damn sense in me talking at all—but, just the same, I'm going to talk and you're going to listen. You talk about your precious 'Covenant' as if it were something holy. I don't agree to it, and I don't accept it. You act as if it had been sent down from Heaven in a burst of light. My grandfathers fought in the Second Revolution—but they fought to abolish superstition—not to let sheep-minded fools set up new ones.

"There were men in those days!" He looked with aversion around the ring of faces. "What is there left today? Cautious, compromising, 'safe' weaklings with water in their veins. You've planned your whole world so carefully that you've planned the fun and zest right out of it. Nobody is ever hungry, nobody ever gets hurt. Your ships can't crack up and your crops can't fail. You even have the weather tamed so it rains politely—after midnight. Why wait till midnight, I don't know—you all go to bed at nine o'clock!

"If one of you safe little people *should* have an unpleasant emotion —perish the thought!—you'd trot right over to the nearest psychodynamics clinic and get your soft little minds readjusted. Thank God I never succumbed to that dope habit. I'll keep my own feelings, thanks, no matter how bad they taste.

"You won't even make love without consulting a psychotechnician! Is her mind as flat and insipid as mine? Is there any emotional instability in her family? It's enough to make a man gag. As for fighting over a woman—if anyone had the guts to do that he'd find a proctor at his elbow in two minutes, looking for the most convenient place to paralyze him, and inquiring with sickening humility, 'May I do you a service, sir?' "

THE BAILIFF edged closer to MacKinnon. He turned on the official. "Stand back, you. I'm not through yet." Then, resuming, "You've told me to choose between the Two Alternatives. Well, it's no hard choice for me. Before I'd submit to treatment, before I'd enter one of your neat little, safe little, pleasant little reorientation homes and let my mind be pried into by a lot of soft-fingered doctors—before I did anything like that I'd choose a nice, clean death. Oh, no—there is just one choice for me, not two. I take the choice of going to Coventry—and damned glad, to. I hope I never hear of the United States again!

"But there is just one thing I want to ask you before I go—why do you bother to live, anyhow? I would think that any one of you would welcome an end to your silly, futile lives just from sheer boredom. That's all." He turned back to the bailiff. "Come on, you."

"One moment, David MacKinnon." The senior judge held up a restraining hand. "We have listened to you. Although custom does not compel it, I am minded to answer some of your statements. Will you listen?"

Unwilling, but less willing to appear loutish in the face of a request so obviously reasonable, the younger man consented.

The judge commenced to speak in gentle, scholarly words appropriate to a lecture room. "David MacKinnon, you have spoken in a fashion that doubtless seems wise to you. Nevertheless, your words were wild, and spoken in haste. I am moved to correct your obvious misstate-

ments of fact. The Covenant is not a superstition, but a simple temporal contract entered into by those same revolutionists for pragmatic reasons. They wished to insure the maximum possible liberty for every person.

"You yourself have enjoyed that liberty. No possible act, nor mode of conduct, was forbidden to you, as long as your action did not damage another. Even an act specifically prohibited by law could not be held against you unless the State was able to prove that your particular act damaged, or caused evident danger of damage to a particular individual.

"Even if one should willfully and knowingly damage another—as you have done—the State does not attempt to sit in moral judgment, nor to punish. We have not the wisdom to do that, and the chain of injustices that have always followed such moralistic coercion endanger the liberty of all. Instead, the convicted is given the choice of submitting to psychological readjustment to correct his tendency to wish to damage others, or of having the State withdraw itself from him—of sending him to Coventry!

"You complain that our way of living is dull and unromantic, and imply that we have deprived you of excitement to which you feel entitled. You are free to hold and express your æsthetic opinion of our way of living, but you must not expect us to live to suit your tastes. You are free to seek danger and adventure if you wish—there is danger still in experimental laboratories; there is hardship in the mountains of the Moon, and death in the jungles of Venus—but you are not free to expose us to the violence of your nature."

"Why make so much of it?" MacKinnon protested contemptuously. "You talk as if I had committed a murder. I simply punched a man in the nose for offending me outrageously!"

"I agree with your æsthetic judgment of that individual," the judge continued calmly, "and am not displeased at his misfortune, but your psychometrical tests show that you believe yourself capable of judging morally your fellow citizens and feel justified in personally correcting and punishing their lapses. You are a dangerous individual, David MacKinnon, a danger to all of us, for we cannot predict what damage you may do next. From a social standpoint, your delusion makes you as mad as the March Hare.

"You refuse treatment—therefore we withdraw our society from you, we cast you out, we divorce you. To Coventry with you." He turned to the bailiff. "Take him away."

MacKinnon peered out of a forward port of the big transport helicopter with repressed excitement in his heart. There! That must be it—that black band in the distance. The helicopter drew closer, and he became certain that he was seeing the Barrier—the mysterious, impenetrable wall that divided the United States from the reservation known as Coventry.

His guard looked up from the magazine he was reading and followed his gaze. "Nearly there, I see," he said pleasantly. "Well, it won't be long now."

"It can't be any too soon for me!"

The guard looked at him quizzically, but with tolerance. "Pretty anxious to get on with it, eh?"

MacKinnon held his head high. "You've never brought a man to the gateway that was more anxious to pass through!"

"Hm-m-m—maybe. They all say

that, you know. Nobody goes through the gate against his own will."

"I mean it!"

"They all do. Some of them come back, just the same."

"Say—maybe you can give me some dope as to conditions inside."

"Sorry," the guard said, shaking his head, "but that is no concern of the United States, nor any of its employees. You'll know soon enough."

MacKinnon frowned a little. "It seems strange. I tried inquiring, but found no one who would admit that they had any notion about the inside. And yet you say that some come out. Surely some of them must talk—"

"That's simple," smiled the guard, "part of their reorientation is a subconscious compulsion not to discuss their experiences."

"That's a pretty scabby trick. Why should the government deliberately conspire to prevent me, and people like me, from knowing what we are going up against?"

"Listen, buddy," the guard answered, with mild exasperation, "you've told the rest of us to go to the devil. You've told us that you could get along without us. You are being given plenty of living room in some of the best land on this continent, and you are being allowed to take with you everything that you own, or your credit could buy. What the deuce else do you expect?"

MacKinnon's face settled in obstinate lines. "What assurance have I that there will be any land left for me?"

"That's your problem. The government sees to it that there is plenty of land for the population. The divvy-up is something you rugged individualists have to settle among yourselves. You've turned down our type of social co-operation; why the hell should you expect the safeguards of our organization?" The guard turned back to his reading and ignored him.

They landed on a small field which lay close under the blank black wall. No gate was apparent, but a guardhouse was located at the side of the field. MacKinnon was the only passenger. While his escort went over to the guardhouse, he descended from the passenger compartment and went around to the freight hold.

Two members of the crew were letting down a ramp from the cargo port. When MacKinnon drew near, one of them eyed him and said, "O. K., there's your stuff. Help yourself."

He sized up the job and said, "It's quite a lot, isn't it? I'll need some help. Will you give me a hand with it?"

The crew member addressed paused to light a cigarette before replying, "It's your stuff. If you want it, get it out. We take off in ten minutes." The two walked around him and re-entered the ship.

"Why, you—" MacKinnon shut up and kept the rest of his anger to himself. The surly louts! Gone was the faintest trace of regret at leaving civilization. He'd show them! He could get along without them.

But it was twenty minutes and more before he stood beside his heaped-up belongings and watched the ship rise. Fortunately the skipper had not been adamant about the time limit. MacKinnon turned and commenced loading his steel tortoise. Under the romantic influence of the classic literature of a bygone day he had considered using a string of burros, but had been unable to find a zoo that would sell

them to him. It was just as well—he was completely ignorant of the limits, foibles, habits, vices, illnesses, and care of those useful little beasts, and unaware of his own ignorance. Master and servant would have vied in make each other unhappy.

The vehicle he had chosen was not an unreasonable substitute for burros. It was extremely rugged, easy to operate, and almost foolproof. It drew its power from six square yards of sun-power screens on its low curved roof. These drove a constant-load motor, or, when halted, replenished the storage battery against cloudy weather, or night travel. The bearings were "everlasting," and every moving part, other than the caterpillar treads and the controls, was sealed up, secure from inexpert tinkering. It could maintain a steady six miles per hour on smooth, level pavement. When confronted by hills, or rough terrain, it did not stop, but simply slowed until the task demanded equaled its steady power output.

The steel tortoise gave MacKinnon a feeling of Crusoelike independence. It did not occur to him his chattel was the end product of the cumulative effort and intelligent co-operation of hundreds of thousands of men, living and dead. He had been accustomed all his life to the unfailing service of much more intricate machinery, and honestly regarded the tortoise as a piece of equipment of the same primitive level as a woodsman's ax, or a hunting knife. His talents had been devoted in the past to literary criticism rather than engineering, but that did not prevent him from believing that his native intelligence and the aid of a few reference books would be all that he would really need to duplicate the tortoise, if necessary.

Metallic ores were necessary, he knew, but saw no obstacle in that, his knowledge of the difficulties of prospecting, mining, and metallurgy being as sketchy as his knowledge of burros.

His goods filled every compartment of the compact little freighter. He checked the last item from his inventory and ran a satisfied eye down the list. Any explorer, or adventurer of the past might well be pleased with such equipment, he thought. He could imagine showing Jack London his knock-down cabin. "See, Jack," he would say, "it's proof against any kind of weather—perfectly insulated walls and floor, and can't rust. It's so light that you can set it up in five minutes by yourself, yet it's so strong that you can sleep sound with the biggest grizzly in the world snuffling right outside your door."

And London would scratch his head and say, "Dave, you're a wonder. If I'd had that in the Yukon it would have been a cinch!"

He checked over the list again. Enough concentrated and dessicated food and vitamin concentrates to last six months. That would give him time enough to build hothouses for hydroponics and get his seeds started. Medical supplies—he did not expect to need those, but foresight was always best. Reference books of all sorts. A light sporting rifle—vintage: Last century. His face clouded a little at this. The war department had positively refused to sell him a portable blaster. When he had claimed the right of common social heritage they had grudgingly provided him with the plans and specifications and told him to build his own. Well, he would, the first spare time he got.

Everything else was in order. McKinnon climbed into the cockpit, grasped the two hand controls and swung the nose of the tortoise toward the guardhouse. He had been ignored since the ship had landed; he wanted to have the gate opened and to leave.

Several soldiers were gathered around the guardhouse. He picked out a legate by the silver stripe down the side of his kilt and spoke to him. "I'm ready to leave. Will you kindly open the gate?"

"O. K.," the officer answered him, and turned to a soldier who wore the plain gray kilt of a private's field uniform. "Jenkins, tell the powerhouse to dilate—about a number three opening, tell them," he added, sizing up the dimensions of the tortoise.

He turned to MacKinnon. "It is my duty to tell you that you may return to civilization, even now, by agreeing to be hospitalized for your neurosis."

"I have no neurosis!"

"Very well. If you change your mind at any future time, return to the place where you entered. There is an alarm there with which you may signal to the guard that you wish the gate opened."

"I can't imagine needing to know that."

The legate shrugged. "Perhaps not—we send refugees to quarantine all the time. If I were making the rules, it might be harder to get out again." He was cut off by the ringing of an alarm. The soldiers near them double-timed away, drawing their blasters from their belts as they ran. The ugly snout of a fixed blaster poked out over the top of the guardhouse and pointed toward the Barrier.

The legate answered the question on MacKinnon's face. "The powerhouse is ready to open up." He waved smartly toward that building and turned back. "Drive straight through the center of the opening. It takes a lot of power to suspend the stasis; if you touch the edge we'll have to pick up the pieces."

A tiny, bright dot appeared in the foot of the barrier opposite where they waited. It spread into a half circle across the lampblack nothingness. Now it was large enough for MacKinnon to see the brown countryside beyond through the arch it had formed. He peered eagerly.

The opening grew until it was twenty feet wide, then stopped. It framed a scene of rugged, barren hills. He took this in and turned angrily on the legate. "I've been tricked!" he exclaimed. "That's not fit land to support a man."

"Don't be hasty," he told MacKinnon. "There's good land beyond. Besides, you don't have to enter. But if you are going, go!"

MacKinnon flushed and pulled back on both hand controls. The treads bit in and the tortoise lumbered away, straight for the gateway to Coventry.

MacKinnon glanced back when he was several yards beyond the gate. The Barrier loomed behind him, with nothing to show where the opening had been. There was a little sheet-metal shed adjacent to the point where he had passed through. He supposed that it contained the alarm the legate had mentioned, but he was not interested, and turned his eyes back to his driving.

Stretching before him, twisting between the rocky hills, was a road of sorts. It was not paved, and the surface had not been repaired recently, but the grade averaged downhill, and the tortoise was able

to maintain a respectable speed. He continued down it, not because he fancied it, but because it was the only road which led out of surroundings obviously unsuited to his needs.

The road was untraveled. This suited him; he had no wish to encounter other human beings until he had located desirable land to settle on and had staked out his claim. But the hills were not devoid of life; several times he caught glimpses of little dark shapes scurrying among the rocks, and occasionally bright, beady eyes stared back into his.

It did not occur to him at first that these timid little animals, streaking for cover at his coming, could replenish his larder—he was simply amused and warmed by their presence. When he did happen to consider that they might be used as food, the thought was at first repugnant to him—the practice of killing for "sport" had ceased to be customary long before his time; and inasmuch as the development of cheap synthetic proteins in the latter half of the preceding century had spelled the economic ruin of the business of breeding animals for slaughter, it is doubtful if he had ever tasted animal tissue in his life.

But once considered, it was logical to act. He expected to live off the country; although he had plenty of food on hand for the immediate future, it would be wise to conserve it by using what the country offered. He suppressed his æsthetic distaste and ethical misgivings, and determined to shoot one of the little animals at the first opportunity.

Accordingly, he dug out the rifle, loaded it, and placed it handy. With the usual perversity of the world as it is, no game was evident for the next half-hour. He was passing a little shoulder of rocky outcropping when he saw his prey. It peeked at him from behind a small boulder, its sober eyes wary but unperturbed. He stopped the tortoise and took careful aim, resting and steadying the rifle on the side of the cockpit. His quarry accommodated him by hopping out into full view.

He pulled the trigger, involuntarily tensing his muscles and squinting his eyes as he did so. Naturally, the shot went high and to the right.

But he was much too busy just then to be aware of it. It seemed that the whole world had exploded. His right shoulder was numb, his mouth stung as if he had been kicked there, and his ears rang in a strange and unpleasant fashion. He was surprised to find the gun still intact in his hands and apparently none the worse for the incident.

He put it down, clambered out of the car, and rushed up to where the small creature had been. There was no sign of it anywhere. He searched the immediate neighborhood but did not find it. Mystified, he returned to his conveyance, having decided that the rifle was in some way defective, and that he should inspect it carefully before attempting to fire it again.

His recent target watched his actions cautiously from a vantage point many yards away, to which it had stampeded at the sound of the explosion. It was equally mystified by the startling events, being no more used to firearms than MacKinnon.

Before he started the tortoise again, MacKinnon had to see to his upper lip, which was swollen and tender, and bleeding from a deep scratch. This increased his conviction that the gun was defective. Nowhere in the romantic literature of the nineteenth and twentieth cen-

turies, to which he was addicted, had there been a warning that, when firing a gun heavy enough to drop a man in his tracks, it is well not to hold the right hand in such a manner that the recoil will cause the right thumb and thumbnail to strike the mouth.

He applied an antiseptic and a dressing of sorts and went on his way, somewhat subdued. The little arroyo by which he had entered the hills had widened out, and the hills were greener. He passed around one particularly sharp turn in the road and found a broad, fertile valley spread out before him. It stretched away until it was lost in the warm day's haze.

Much of the valley floor was cultivated, and he could make out human habitations. He continued toward it with mixed feelings. People meant fewer hardships, but it did not look as if staking out a claim would be as simple as he had hoped. However, Coventry was a big place.

He had reached the point where the road gave on to the floor of the valley when two men stepped out into his path. They were carrying weapons of some sort at the ready. One of them called out to him:

"Halt!"

MacKinnon did so, and answered him as they came abreast. "What do you want?"

"Customs inspection. Pull over there by the office." He indicated a small building set back a few feet from the road, which MacKinnon had not previously noticed. He looked from it back to the spokesman and felt a slow, unreasoning heat spread up from his viscera. It colored his point of view and rendered his none-too-stable judgment still more unsound.

"What the deuce are you talking about?" he snapped. "Stand aside and let me pass."

The one who had remained silent raised his weapon and aimed it at MacKinnon's chest. The other grabbed his arm and pulled the weapon out of line. "Don't shoot the dumb fool, Joe," he said testily. "You're always too anxious." Then to MacKinnon, "You're resisting the law. Come on—be quick about it!"

"The law?" MacKinnon gave a short, bitter laugh, and snatched his rifle up from the seat beside him. It never reached his shoulder—the man who had done all the talking fired casually, without apparently taking time to aim. The rifle was smacked from MacKinnon's grasp, and flew into the air, landing some forty feet away in the roadside ditch behind the tortoise.

The member of the pair who had remained silent followed the flight of the gun with detached interest and remarked, "Nice shot, Blackie. Never touched him."

"Oh, just luck," the other demurred, but grinned his pleasure at the compliment. "Glad I didn't nick him, though—saves writing out a report." He returned his stubby, curiously convoluted weapon to his belt, reassumed a crisp, official manner, and spoke again to MacKinnon, who had been sitting in dumfounded silence, rubbing his painfully smarting hands. "Well, tough guy? Do you behave, or do we come up there and get you?"

MacKinnon gave in. He drove the tortoise to the designated spot and waited sullenly for orders. "Get out and start unloading," he was told.

He obeyed, under compulsion. As he piled his precious possessions on the ground the one addressed as Blackie separated each item into two piles, while Joe listed them on a

printed form. He noticed presently that Joe listed only the items that went into the first pile. But he did not understand that he was being robbed until Blackie told him to reload the tortoise with the items from that pile, and commenced himself to carry goods from the other pile into the building. MacKinnon started to protest—

Joe punched him in the mouth, coolly and without rancor. MacKinnon went down, but got up again, fighting. He was in such a blind rage that he would have tackled a charging rhino just as readily. Joe timed his rush and clipped him again. This time he could not get up at once.

Blackie stepped over to the washstand in one corner of the office. Presently he came back with a wet towel and chucked it at MacKinnon. "Wipe your face on that, bud, and get back into the buggy. We got to get going."

MacKinnon had time to do a lot of serious thinking as he drove Blackie into town. Beyond a terse answer of "Prize court" to MacKinnon's inquiry as to their destination, Blackie did not converse, nor did MacKinnon press him to, anxious as he was to have information. His mouth pained him from the repeated punishment it had taken, his head ached, and he was no longer tempted to precipitate action by hasty speech.

Evidently Coventry was not quite the frontier anarchy he had expected it to be. There was a government of sorts, evidently, but it resembled nothing that he had ever been used to. He had visualized a land of noble, independent spirits who gave each other wide berth and practiced mutual respect. There would be villains, of course, but they would be treated to summary, and probably lethal, justice as soon as they demonstrated their ugly natures. He had a strong, though subconscious, assumption that virtue is necessarily triumphant.

But having found government, he expected it to follow the general pattern that he had been used to all his life—honest, conscientious, reasonably efficient, and invariably careful of a citizen's rights and liberties. He was aware that government had not always been like that, but he had never experienced it—the idea was as remote and implausible as cannibalism, or chattel slavery.

Had he stopped to think about it, he might have realized that public servants in Coventry would never have been examined psychologically to determine their temperamental fitness for their duties, and, that since every inhabitant of Coventry was there—as he was—for violating a basic custom and refusing treatment thereafter, it was a foregone conclusion that most of them would be erratic and arbitrary.

He pinned his hope on the knowledge that they were going to court. All he asked was a chance to tell his story to the judge.

His immediate dependence on judicial procedure may appear inconsistent in view of how recently he had renounced all reliance on organized government, but it was only superficially so. He could renounce government verbally, but he could not do away with a lifetime of environmental conditioning. His cortex was canalized, whether he wished it or not, into certain evaluating habits. He could curse the court that had humiliated him by condemning him to the Two Alternatives, but he expected courts to dispense justice. He could assert his own rugged independence, but he

expected persons he encountered to behave as if they were bound by the Covenant—he had met no other sort. He was no more able to discard his past history than he would have been to discard his accustomed body.

But he did not know it yet.

MacKinnon failed to stand up when the judge entered the courtroom. Court attendants quickly set him right, but not before he had provoked a glare from the bench. The judge's appearance and manner were not reassuring. He was a well-fed man, of ruddy complexion, whose sadistic temper was evident in face and voice. They waited while he dealt drastically with several petty offenders. It seemed to MacKinnon, as he listened, that almost everything was against the law.

Nevertheless, he was relieved when his name was called. He stepped up and undertook at once to tell his story. The judge's gavel cut him short.

"What is this case?" the judge demanded, staring at MacKinnnon's damaged features, his face set in grim, intolerant lines. "Drunk and disorderly, apparently. I shall put a stop to this slackness among the young if it takes the last ounce of strength in my body!" He turned to the clerk. "Any previous offenses?"

The clerk whispered in his ear. The judge threw MacKinnon a look of mixed annoyance and suspicion, then told the customs guard to come forward. Blackie told a clear, straightforward tale with the ease of a man used to giving testimony. MacKinnon's condition was attributed to resisting an officer in the execution of his duty. He submitted the inventory his colleague had prepared, but failed to mention the large quantity of goods which had been abstracted before the inventory was made.

The judge turned to MacKinnon. "Do you have anything to say for yourself?"

"I certainly have, doctor," he began eagerly. "There isn't a word of—"

Bang! The gavel cut him short. A court attendant hurried to MacKinnon's side and attempted to explain to him the proper form to use in addressing the court. The explanation confused him. In his experience, "judge" naturally implied a medical man—a psychologist skilled in social problems. Nor had he heard of any special speech forms appropriate to a courtroom. But he amended his language as instructed.

"May it please the honorable court, this man is lying. He and his companion assaulted and robbed me. I was simply—"

"Smugglers generally think they are being robbed when customs officials catch them," the judge sneered. "Do you deny that you attempted to resist inspection?"

"No, your honor, but—"

"That will do. Penalty of fifty percent is added to the established scale of duty. Pay the clerk."

"But, your honor, I can't—"

"Can't you pay it?"

"I haven't any money. I have only my possessions."

"So?" He turned to the clerk. "Condemnation proceedings. Impound his goods. Ten days for vagrancy. The community can't have these immigrant paupers roaming at large, and preying on law-abiding citizens. Next case!"

They hustled him quickly away. It took the sound of the key grating in the barred door behind him

to make him realize the extent of his predicament.

"Hi, pal, how's the weather outside?" The detention cell had a prior inmate, a small, well-knit man who looked up from a game of solitaire to address MacKinnon. He sat astraddle a wooden bench on which he had spread his cards, and studied the newcomer with unworried, bright, beady eyes.

"Clear enough outside—but stormy in the courtroom," MacKinnon answered, trying to adopt the same bantering tone and not succeeding very well. His mouth hurt him and spoiled his grin.

The other swung a leg over the bench and approached him with a light, silent step. "Say, pal, you must 'a' caught that in a gear box," he commented, inspecting MacKinnon's mouth. "Does it hurt?"

"Like the devil," MacKinnon admitted.

"We'll have to do something about that." He went to the cell door and rattled it, filling the building with the din. "Hey! Lefty! The house is on fire! Come a-runnin'!"

The guard sauntered down and stood opposite their cell door. "Wha' d'yuh want, Fader?" he said noncommittally.

"My old school chum has been slapped in the face with a wrench, and the pain is inordinate. Here's a chance for you to get right with Heaven by oozing down to the dispensary and snagging a dressing and about five grains of neoanodyne."

The guard's expression was not encouraging. The prisoner looked grieved. "Why, Lefty," he said, "I thought you would jump at a chance to do a little pure charity like that." He waited for a moment, then added, "Tell you what—you do it and I'll show you how to work that puzzle about 'How old is Ann?' Is it a go?"

"Show me first."

"It would take too long. I'll write it out and give it to you."

When the guard returned, MacKinnon's cell mate dressed his wounds with gentle deftness, talking the while. "They call me Fader Magee. What's your name, pal?"

"David MacKinnon. I'm sorry, but I didn't quite catch your first name."

"Fader. It isn't," he explained with a grin, "the name my mother gave me. It's more a professional tribute to my shy and unobtrusive nature."

MacKinnon looked puzzled. "Professional tribute? What is your profession?"

Magee looked pained. "Why, Dave," he said, "I didn't ask you that. However," he went on, "it's probably the same as yours—self-preservation."

Magee was a sympathetic listener, and MacKinnon welcomed the chance to tell someone about his troubles. He related the story of how he had decided to enter Coventry rather than submit to the sentence of the court, and how he had hardly arrived when he was hijacked and hauled into court.

Magee nodded. "I'm not surprised," he observed. "A man has to have larceny in his heart or he wouldn't be a customs guard."

"But what happens to my belongings?"

"They auction them off to pay the duty."

"I wonder how much there will be left for me."

Magee stared at him. "Left over? There won't be anything left over. You'll probably have to pay a deficiency judgment."

"Huh? What's that?"

"It's a device whereby the condemned pays for the execution," Magee explained succinctly, if somewhat obscurely. "What it means to you is that when your ten days are up you'll still be in debt to the court. Then it's the chain gang for you, my lad. You'll work it off at a dollar a day."

"Fader—you're kidding me."

"Wait and see. You've got a lot to learn, Dave."

COVENTRY was an even more complex place than Dave had gathered up to this time. Magee explained to him that there were actually three sovereign, independent jurisdictions. The jail where they were prisoners lay in the so-called New America. It had the forms of democratic government, but the treatment he had already received was a fair sample of the fashion in which it was administered.

"This place is heaven itself com-

"Leave him alone, Alec," snapped Magee. "He's just come in from Outside, but he's raised hell enough since. He's all right."

pared with the Free State," Magee maintained. "I've been there."

The Free State was an absolute dictatorship; the head man of the ruling clique was designated the "Liberator." Their watchwords were duty and obedience; an arbitrary discipline was enforced with a severity that left no room for any freedom of opinion. Governmental theory was vaguely derived from the old functionalist doctrines. The State was thought of as a single organism with a single head, a single brain, and a single purpose. Anything not compulsory was forbidden.

"Honest, so help me," claimed Magee, "you can't go to bed in that place without finding one of their damned secret police between the sheets."

"But at that," he continued, "it's an easier place to live than with the Angels."

"The Angels?"

"Sure. We still got 'em. Must've been two or three thousand diehards that chose to go to Coventry after the Revolution—you know that. There's still a colony up in the hills to the north, complete with Prophet Incarnate and the works. They aren't bad hombres, but they'll pray you into heaven even if it kills you."

All three States had one curious characteristic in common—each one claimed to be the only legal government of the entire United States, and looked forward to some future day when they would reclaim the "unredeemed" portion; i. e., outside Coventry. To the Angels this was an event which would occur when the First Prophet returned to Earth to lead them again. In New America it was hardly more than a convenient campaign plank, to be forgotten after each election. But in the Free State it was a fixed policy.

Pursuant to this purpose there had been a whole series of wars between the Free State and New America. The Liberator held, quite logically, that New America was an unredeemed section, and that it was necessary to bring it under the rule of the Free State before the advantages of their culture could be extended to the outside.

Magee's words demolished MacKinnon's dream of finding an anarchistic Utopia within the Barrier, but he could not let his fond illusion die without a protest. "But see here, Fader," he persisted, "isn't there some place where a man can live quietly by himself without all this insufferable interference?"

"No—" considered Fader. "No, not unless you took to the hills and hid. Then you'd be all right, as long as you steered clear of the Angels. But it would be pretty slim pickin's, living off the country. Ever tried it?"

"No, not exactly. But I've read all the classics; Zane Grey, and Emerson Hough, and so forth."

"Well—maybe you could do it. But if you really want to go off and be a hermit you'd do better to try it on the Outside, where there aren't so many objections to it."

"No"—MacKinnon's backbone stiffened at once—"no, I'll never do that. I'll never submit to psychological reorientation just to have a chance to be let alone. If I could go back to where I was before a couple of months ago, before I was arrested, it might be all right to go off to the Rockies, or look up an abandoned farm somewhere. But with that diagnosis staring me in the face—after being told I wasn't fit for human society until I had had my emotions retailored to fit a cautious

little pattern, I couldn't face it. Not if it meant going to a sanitarium—"

"I see," agreed Fader, nodding, "you want to go to Coventry, but you don't want the Barrier to shut you off from the rest of the world."

"No, that's not quite fair— Well, maybe, in a way. Say, you don't think I'm not fit to associate with, do you?"

"You look all right to me," Magee reassured him with a grin, "but I'm in Coventry, too, remember. Maybe I'm no judge."

"You don't talk as if you liked it much. Why are you here?"

Magee held up a gently admonishing finger. "Tut! Tut! That is the one question you must never ask a man here. You must assume that he came here because he knew how swell everything is here."

"Still—you don't seem to like it."

"I didn't say I didn't like it. I do like it; it has flavor. Its little incongruities are a source of innocent merriment. And any time they turn on the heat I can always go back through the gate and rest up for a while in a nice quiet hospital, until things quiet down."

MacKinnon was puzzled again. "Turn on the heat? Do they supply too hot weather here?"

"Huh? Oh, I didn't mean weather control—there isn't any of that here except what leaks over from Outside. I was just using an old figure of speech."

"What does it mean?"

Magee smiled to himself. "You'll find out."

After supper—bread, stew in a metal dish, a small apple—Magee introduced MacKinnon to the mysteries of cribbage. Fortunately MacKinnon had no cash to lose. Presently Magee put the cards down without shuffling them. "Dave," he said, "are you enjoying the hospitality offered by this institution?"

"Hardly. Why?"

"I suggest that we check out."

"A good idea, but how?"

"That's what I've been thinking about. Do you suppose you could take another poke on that battered phiz of yours in a good cause?"

MacKinnon cautiously fingered his face. "I suppose so—if necessary. It can't do me much more harm, anyhow."

"That's mother's little man! Now listen. This guard, Lefty, in addition to being kind o' unbright, is sensitive about his appearance. When they turn out the lights, you just—"

"Let me out of here! Let me out of here!" MacKinnon beat on the bars and screamed. No answer came. He renewed the racket, his voice an hysterical falsetto. Lefty arrived to investigate, grumbling.

"What the hell's eating on you?" he demanded, peering through the bars.

MacKinnon changed to tearful petition. "Oh, Lefty, please let me out of here. Please! I can't stand the dark. It's dark in here—please don't leave me alone." He flung himself, sobbing, on the bars.

The guard cursed to himself. "Another slug-nutty. Listen, you—shut up and go to sleep or I'll come in there and give you something to yelp for!" He started to leave.

MacKinnon changed instantly to the vindictive, unpredictable anger of the irresponsible. "You big, ugly baboon! You rat-faced idiot! Where'd ja get that nose?"

Lefty turned back, fury in his face. He started to speak. MacKinnon cut him short. "Yah! Yah! Yah!" he gloated like a nasty little

boy. "Lefty's mother was scared by a warthog—"

The guard swung at the spot where MacKinnon's face was pressed between the bars of the door. MacKinnon ducked and grabbed simultaneously. Off balance at meeting no resistance, the guard rocked forward, thrusting his forearm between the bars. MacKinnon's fingers slid along his arm and got a firm purchase on Lefty's wrist.

He threw himself backward, dragging the guard with him, until Lefty was jammed up against the outside of the barred door, with one arm inside, to the wrist of which MacKinnon clung as if welded.

The yell which formed in Lefty's throat miscarried; Magee had already acted. Out of the darkness, silent as death, his slim hands had snaked between the bars and embedded themselves in the guard's fleshy neck. Lefty heaved and almost broke free, but MacKinnon threw his weight to the right and twisted the arm he gripped in an agonizing, bone-breaking leverage.

It seemed to MacKinnon that they remained thus, like some grotesque game of statues, for an endless period. His pulse pounded in his ears until he feared that it must be heard by others, and bring rescue to Lefty.

Magee spoke at last: "That's enough," he whispered. "Go through his pockets."

He made an awkward job of it, for his hands were numb and trembling from the strain, and it was anything but convenient to work between the bars. But the keys were there, in the last pocket he tried. He passed them to Magee, who let the guard slip to the floor and accepted them.

Magee made a quick job of it. The door swung open with a distressing creak. Dave stepped over Lefty's body, but Magee kneeled down, unhooked a truncheon from the guard's belt and cracked him behind the ear with it.

MacKinnon paused. "Did you kill him?" he asked.

"Cripes, no," Magee answered softly. "Lefty is a friend of mine. Let's go."

They hurried down the dimly lighted passageway between the cells toward the door leading to the administrative offices—their only outlet. Lefty had carelessly left it ajar, and light shone through the crack, but as they silently approached it they heard ponderous footsteps from the far side. Dave looked hurriedly for cover, but the best he could manage was to slink back into the corner formed by the cell block and the wall. He glanced around for Magee, but he had disappeared completely.

The door swung open; a man stepped through, paused, and looked around. MacKinnon saw that he was carrying a black light and wearing its complement—rectifying spectacles. He realized then that the darkness gave him no cover. The black light swung his way; he tensed to spring—

He heard a dull *clunk!* The guard sighed, swayed gently, then collapsed into a loose pile. Magee stood over him, poised on the balls of his feet, and surveyed his work while caressing the business end of the truncheon with the cupped fingers of his left hand.

"That will do," he decided. "Shall we go, Dave?"

Magee eased through the door without waiting for an answer. MacKinnon was close behind him. The lighted corridor led away to right and ended in a large double

door to the street. On the left wall, near the street door, a smaller office door stood open.

Magee drew MacKinnon to him. "It's a cinch," he whispered. "There'll be nobody in there now but the desk sergeant. We get past him, then out that door and into the ozone—" He motioned Dave to keep behind him and crept silently up to the office door. After drawing a small mirror from a pocket in his belt, he lay down on the floor, placed his head near the door frame and cautiously extended the tiny mirror an inch or two past the edge.

Apparently he was satisfied with the reconnaissance the improvised periscope afforded him, for he drew himself back onto his knees and turned his head so that MacKinnon could see the words shaped by his silent lips. "It's all right," he breathed, "there is only—"

Two hundred pounds of uniformed Nemesis landed on his shoulders. A clanging alarm sounded through the corridor. Magee went down fighting, but he was outclassed and caught off guard. He jerked his head free and shouted, "Run for it, kid!"

MacKinnon could hear running feet from somewhere, but could see nothing but the struggling figures before him. He shook his head and shoulders like a dazed animal, then kicked the larger of the two contestants in a fashion forbidden by sportsmanship. The man screamed and let go his hold. MacKinnon grasped his small companion by the scruff of the neck and hauled him roughly to his feet.

Magee's eyes were still merry. "Well played, my lad," he commended in clipped syllables, as they burst out the street door, "if hardly cricket! Where did you learn *La Savate?*"

MacKinnon had not time to answer, being fully occupied in keeping up with Magee's weaving, deceptively rapid progress. They ducked across the street, down an alley and between two buildings.

The succeeding minutes, or hours, were confusion to MacKinnon. He remembered afterward crawling along a rooftop and letting himself down to crouch in the blackness of an interior court, but he could not remember how they had gotten on the roof. He also recalled spending an interminable period alone, compressed inside a most unsavory refuse bin, and his terror when footsteps approached the bin and a light flashed through a crack.

A crash and the sound of footsteps in flight immediately thereafter led him to guess that Fader had drawn the pursuit away from him. But when Fader did return and opened the top of the bin, MacKinnon almost throttled him before identification was established.

When the active pursuit had been shaken off, Magee guided him across town, showing a sophisticated knowledge of back ways and short cuts, and a genius for taking full advantage of cover. They reached the outskirts of the town in a dilapidated quarter, far from the civic center. Magee stopped. "I guess this is the end of the line, kid," he told Dave. "If you follow this street you'll come to the open country shortly. That's what you wanted, wasn't it?"

"I suppose so," MacKinnon replied uneasily, and peered down the street. Then he turned back to speak again to Magee.

But Magee was gone. He had faded away into the shadows. There was neither sight nor sound of him.

MacKinnon started in the suggested direction with a heavy heart. There was no possible reason to expect Magee to stay with him; the service Dave had done him with a lucky kick had been repaid with interest—yet he had lost the only friendly companionship he had found in a strange place. He felt lonely and depressed.

He continued along, keeping to the shadows and watching carefully for shapes that might be patrolmen. He had gone a few hundred yards and was beginning to worry about how far it might be to open countryside when he was startled into gooseflesh by a hiss from a dark doorway.

He did his best to repress the unreasoning panic that beset him, and was telling himself that policemen never hiss, when a shadow detached itself from the blackness and touched him on the arm.

"Dave," it said softly.

MacKinnon felt a childlike sense of relief and well-being. "Fader!"

"I changed my mind, Dave. The gendarmes would have you in tow before morning. You don't know the ropes—so I came back."

Dave was both pleased and crestfallen. "Hell's bells, Fader," he protested, "you shouldn't worry about me. I'll get along."

Magee shook him roughly by the arm. "Don't be a chump. Green as you are, you'd start to holler about your civil rights, or something, and get clipped in the mouth again.

"Now see here," he went on, "I'm going to take you to some friends of mine who will hide you until you're smartened up to the tricks around here. But they're on the wrong side of the law, see? You'll have to be all three of the three sacred monkeys—see no evil, hear no evil, tell no evil. Think you can do it?"

"Yes, but—"

"No 'buts' about it. Come along!"

THE ENTRANCE was in the rear of an old warehouse. Steps led down into a little sunken court. From this open areaway—foul with accumulated refuse—a door let into the back wall of the building. Magee tapped lightly but systematically, waited and listened. Presently he whispered, "*Ps-s-st!* It's the Fader."

The door opened quickly and Magee was encircled by two great, fat arms. He was lifted off his feet, while the owner of those arms planted a resounding buss on his cheek! "Fader!" she exclaimed. "Are you all right, lad? We've missed you."

"Now that's a proper welcome, mother," he answered when he was back on his own feet, "but I want you to meet a friend of mine. Mother Johnston, this is David MacKinnon."

"May I do you a service?" David acknowledged with automatic formality, but Mother Johnston's eyes tightened with instant suspicion.

"Is he stooled?" she snapped.

"No, mother, he's a new immigrant—but I vouch for him. He's on the dodge, and I've brought him here to cool."

She softened a little under his sweetly persuasive tones. "Well—"

Magee pinched her cheek. "That's a good girl! When are you going to marry me?"

She slapped his hand away. "Even if I were forty years younger I'd not marry such a scamp as you! Come along, then," she continued to MacKinnon, "as long as you're a friend of the Fader—though it's no credit to you!" She waddled quickly ahead of them down a flight of stairs

while calling out for someone to open the door at its foot.

The room was poorly lighted with a few obsolete glow tubes and was furnished principally with a long table and some chairs, at which an odd dozen people were seated, drinking and talking. It reminded MacKinnon of prints he had seen of old English pubs in the days before the Collapse.

Magee was greeted with a babble of boisterous welcome. "Fader!" "It's the kid himself!" "How'd ja do it this time, Fader? Crawl down the drains?" "Set 'em up, mother—the Fader's back!"

He accepted the ovation with a wave of his hand and a shout of inclusive greeting, then turned to MacKinnon. "Folks," he said, his voice cutting through the confusion, "I want you to know Dave—the best pal that ever kicked a jailer at the right moment. If it hadn't been for Dave I wouldn't be here."

MacKinnon found himself seated between two others at the table and a stein of beer thrust into his hand by a not uncomely young woman. He started to thank her, but she had hurried off to help Mother Johnston take care of the sudden influx of orders. Seated opposite him was a rather surly young man who had taken little part in the greeting to Magee. He looked MacKinnon over with a face expressionless except for a recurrent tic which caused his right eye to wink spasmodically every few seconds.

"What's your line?" he demanded.

"Leave him alone, Alec," Magee cut in swiftly but in a friendly tone. "He's just arrived inside; I told you that. But he's all right," he continued, raising his voice to include the others present. "He's been here less than twenty-four hours, but he's broken jail, beat up two customs busies, and sassed old Judge Fleishacker right to his face. How's that for a busy day?"

Dave was the center of approving interest, but the party with the tic persisted. "That's all very well, but I asked him a fair question: What's his line? If it's the same as mine, I won't stand for it—it's too crowded now."

"That cheap racket you're in is always crowded, but he's not in it. Forget about his line."

"Why don't he answer for himself?" Alec countered suspiciously. He half stood up. "I don't believe he's stooled—"

It appeared that Magee was cleaning his nails with the point of a slender knife. "Put your nose back in your glass, Alec," he remarked in a conversational tone, without looking up, "or must I cut it off and put it there?"

The other fingered something nervously in his hand. Magee seemed not to notice it, but nevertheless told him, "If you think you can use a vibrator on me faster than I use steel, go ahead—it will be an interesting experiment."

The man facing him stood uncertainly for a moment longer, his tic working incessantly. Mother Johnston came up behind him and pushed him down by the shoulders, saying, "Boys! Boys! Is that any way to behave—and in front of a guest, too! Fader, put that toad sticker away. I'm ashamed of you."

The knife was gone from his hands. "You're right, as always, mother," he grinned. "Ask Molly to fill up my glass again."

AN OLD CHAP sitting on MacKinnon's right had followed these events with alcoholic uncertainty, but he seemed to have gathered something of the gist of it, for now he fixed

Dave with a serum-filled eye and inquired, "Boy, are you stooled to the rogue?" His sweetly sour breath reached MacKinnon as the old man leaned toward him and emphasized his question with a trembling, joint-swollen finger.

Dave looked to Magee for advice and enlightenment. Magee answered for him. "No, he's not—Mother Johnston knew that when she let him in. He's here for sanctuary—as our customs provide!"

An uneasy stir ran around the room. Molly paused in her serving and listened openly. But the old man seemed satisfied. "True—true enough," he agreed, and took another pull at his drink. "Sanctuary may be given when needed, if—" His words were lost in a mumble.

The nervous tension slackened. Most of those present were subconsciously glad to follow the lead of the old man and excuse the intrusion on the score of necessity. Magee turned back to Dave. "I thought that what you didn't know couldn't hurt you—or us—but the matter has been opened."

"But what did he mean?"

"Gramps asked you if you had been stooled to the rogue—whether or not you were a member of the ancient and honorable fraternity of thieves, cutthroats, and pickpockets!"

Magee stared into Dave's face with a look of saturnine amusement. Dave looked uncertainly from Magee to the others, saw them exchange glances, and wondered what answer was expected of him.

Alec broke the pause. "Well," he sneered, "what are you waiting for? Go ahead and put the question to him—or are the great Fader's friends free to use this club without so much as a by your leave?"

"I thought I told you to quiet down, Alec," the Fader replied evenly. "Besides, you're skipping a requirement. All the comrades present must first decide whether or not to put the question at all."

A quiet little man with a chronic worried look in his eyes answered him. "I don't think that quite applies, Fader. If he had come himself, or fallen into our hands— In that case, yes. But you brought him here. I think I speak for all when I say he should answer the question. Unless someone objects, I will ask him myself." He allowed an interval to pass. No one spoke up. "Very well, then. Dave, you have seen too much and heard too much. Will you leave us now—or will you stay and take the oath of our guild? I must warn you that once stooled you are stooled for life—and there is but one punishment for betraying the rogue."

He drew his thumb across his throat in an age-old deadly gesture. Gramps made an appropriate sound effect by sucking air wetly through his teeth and chuckled.

Dave looked around. Magee's face gave him no help. "What is it that I have to swear to?" he temporized.

The parley was brought to an abrupt ending by the sound of pounding outside. There was a shout, muffled by two closed doors and a stairway, of "Open up down there!" Magee got lightly to his feet and beckoned to Dave.

"That's for us, kid," he said. "Come along."

He stepped over to a ponderous old-fashioned radio-phonograph which stood against the wall, reached under it, fiddled for a moment, then swung out one side panel of it. Dave saw that the mechanism had been cunningly rearranged in such a fashion that a man could

squeeze inside it. Magee urged him into it, slammed the panel closed and left him.

MacKinnon's face was pressed up close to the slotted grille which was intended to cover the sound box. Molly had cleared off the two extra glasses from the table and was dumping one drink so that it spread along the table top and erased the rings their glasses had made.

MacKinnon saw the Fader slide under the table and reach up. Then he was gone. Apparently he had, in some fashion, attached himself to the underside of the table.

Mother Johnston made a great to-do of opening up. The lower door she opened at once, with much noise. Then she clumped slowly up the steps, pausing, wheezing, and complaining aloud. MacKinnon heard her unlock the outer door.

"A fine time to be waking honest people up!" she protested. "It's hard enough to get the work done and make both ends meet without dropping what I'm doing every five minutes and—"

"Enough of that, old girl," a man's voice answered, "just get along downstairs. We have business with you."

"What sort of business?" she demanded.

"It might be selling liquor without a license, but it's not—this time."

"I don't. This is a private club. The members own the liquor; I simply serve it to them."

"That's as may be. It's those members I want to talk to. Get out of the way now, and be spry about it."

They come pushing into the room, Mother Johnston, still voluble, carried along by the van. The speaker was a sergeant of police. He was accompanied by a patrolman. Following them were two other uniformed men, but they were soldiers. McKinnon judged by the markings on their kilts that they were corporal and private—provided the insignia in New America were similar to those used by the United States Army.

The sergeant paid no more attention to Mother Johnston. "All right, you men," he called out, "line up!"

They did so, ungraciously but promptly. Molly and Mother Johnston watched them and moved closer to each other.

"All right, corporal—take charge!"

The boy who washed up in the kitchen had been staring round-eyed. He dropped a glass. It bounced around on the hard floor, giving out bell-like sounds in the silence.

The man who had questioned Dave spoke up. "What's all this?"

The sergeant answered with a pleased grin. "Conscription—that's what it is. You are all enlisted in the army for the duration."

"Press gang!" It was an involuntary gasp that came from no particular source.

The corporal stepped briskly forward. "Form a column of twos," he directed. But the little man with the worried eyes was not done.

"I don't understand this," he objected. "We signed an armistice with the Free State three weeks ago."

"That's not your worry," countered the sergeant, "nor mine. We are picking up every able-bodied man not in essential industry. Come along."

"Then you can't take me."

"Why not?"

He held up the stump of a missing hand. The sergeant glanced

from it to the corporal, who nodded grudgingly and said, "O. K.—but report to the office in the morning and register."

He started to march them out when Alec broke ranks and backed up to the wall, screaming, "You can't do this to me! I won't go!" His deadly little vibrator was exposed in his hand, and the right side of his face was drawn up in a spastic wink that left his teeth bare.

"Get him, Steeves," ordered the corporal. The private stepped forward, but stopped when Alec brandished the vibrator at him. He had no desire to have a vibroblade between his ribs, and there was no doubt as to the uncontrolled dangerousness of his hysterical opponent.

The corporal, looking phlegmatic, almost bored, leveled a small tube at a spot on the wall over Alec's head. Dave heard a soft *pop!* and a thin tinkle. Alec stood motionless for a few seconds, his face even more strained, as if he were exerting the limit of his will against some unseen force, then slid quietly to the floor. The tonic spasm in his face relaxed, and his features smoothed into those of a tired and petulant, and rather bewildered, little boy.

"Two of you birds carry him," directed the corporal. "Let's get going."

The sergeant was the last to leave. He turned at the door and spoke to Mother Johnston. "Have you seen the Fader lately?"

"The Fader?" She seemed puzzled. "Why, he's in jail."

"Ah, yes—so he is." He went out.

Magee refused the drink that Mother Johnston offered him.

Dave was surprised to see that he appeared worried for the first time. "I don't understand it," Magee muttered, half to himself, then addressed the one-handed man. "Ed, bring me up to date."

"Not much news since they tagged you, Fader. The armistice was before that. I thought from the papers that things were going to be straightened out for once."

"So did I. But the government must expect war if they are going in for general conscription." He stood up. "I've got to have more data. Al!" The kitchen boy stuck his head into the room.

"Whatcha want, Fader?"

"Go out and make palaver with five or six of the beggars. Look up their king. You know where he makes his pitch?"

"Sure. Over by the auditorium."

"Find out what's stirring, but don't let them know I sent you."

"Right, Fader. It's in the bag." The boy swaggered out.

"Molly."

"Yes, Fader?"

"Will you go out and do the same thing with some of the business girls? I want to know what they hear from their customers." She nodded agreement. He went on, "Better look up that little redhead that has her beat up on Union Square. She can get secrets out of a dead man. Here"—he pulled a wad of bills out of his pocket and handed her several—"you better take this grease. You might have to pay off a cop to get back out of the district."

Magee was not disposed to talk and insisted that Dave get some sleep. He was easily persuaded, not having slept since he entered Coventry. That seemed like a lifetime past; he was exhausted. Mother Johnston fixed him a shakedown in a dark, stuffy room on the same underground level. It had none of the

hygenic comforts to which he was accustomed—air conditioning, restful music, hydraulic mattress, nor soundproofing—and he missed his usual relaxing soak and auto-massage, but he was too tired to care. He slept in clothing and under covers for the first time in his life.

He woke up with a headache, a taste in his mouth like tired sin, and a sense of impending disaster. At first he could not remember where he was—he thought he was still in detention Outside. His surroundings were inexplicably sordid; he was about to ring for the attendant and complain when his memory pieced in the events of the day before. Then he got up and discovered that his bones and muscles were painfully stiff, and—which was worse—that he was, by his standards, filthy dirty. He itched.

MacKinnon entered the common room and found Magee sitting at the table. He greeted Dave. "Hi, kid. I was about to wake you. You've slept almost all day. We've got a lot to talk about."

"O. K.—shortly. Where's the 'fresher?"

"Over there."

It was not Dave's idea of a refreshing chamber, but he managed to take a sketchy shower in spite of the slimy floor. Then he discovered that there was no air blast installed, and he was forced to dry himself unsatisfactorily with his handkerchief. He had no choice in clothes. He must put back on the ones he had taken off or go naked. He recalled that he had seen no nudity anywhere in Coventry, even at sports—a difference in customs, no doubt.

He put his clothes back on, though his skin crawled at the touch of the once-used linen.

Mother Johnston had thrown together an appetizing breakfast for him. He let coffee restore his courage as Magee talked. It was, according to Fader, a serious situaion. New America and the Free State had compromised their differences and had formed an alliance. They quite seriously proposed to break out of Coventry and attack the United States.

MacKinnon looked up at this. "That's ridiculous, isn't it? They'd be outnumbered enormously. Besides, how about the Barrier?"

"I don't know—yet. But they have some reason to think that they can break through the Barrier—and there are rumors that whatever it is can be used as a weapon, too, so that a small army might be able to whip the whole United States."

MacKinnon looked puzzled. "Well," he observed, "I haven't any opinion of a weapon I know nothing about, but as to the Barrier—I'm not a mathematical physicist, but I was always told that it was theoretically impossible to break the Barrier—that it was just a nothingness that there was no way to touch. Of course, you can fly over it, but even that is supposed to be deadly to life."

"Suppose they had found some way to shield from the effects of the Barrier's field," suggested Magee. "Anyhow, that's not the point for us. The point is: They've made this combine; the Free State supplies the techniques and most of the officers; and New America, with its bigger population, supplies most of the men. And that means to us that we don't dare show our faces any place, or we are in the army before you can blink.

"Which brings me to what I was going to suggest. I'm going to duck out of here as soon as it gets dark

and light out for the gateway before they send somebody after me who is bright enough to look under a table. I thought maybe you might want to come along."

"Back to the psychologists?" MacKinnon was honestly aghast.

"Sure—why not? What have you got to lose? This whole damn place is going to be just like the Free State in a couple of days—and a Joe of your temperament would be in hot water all the time. What's so bad about a nice quiet hospital room as a place to hide out until things quiet down? You don't have to pay any attention to the psychiatrists—just make animal noises at 'em every time one sticks his nose into your room, until they get discouraged."

Dave shook his head. "No," he said slowly, "I can't do that."

"Then what will you do?"

"I don't know yet. Take to the hills, I guess. Go live with the Angels if it came to a showdown. I wouldn't mind them praying for my soul as long as they left my mind alone."

They were each silent for a while. Magee was mildly annoyed at MacKinnon's bullheaded stubbornness in the face of what seemed to him a reasonable offer. Dave continued busily to stow away grilled ham while considering his position. He cut off another bite. "My, but this is good," he remarked, to break the awkward silence, "I don't know when I've had anything taste so good. Say—"

"What?" inquired Magee, looking up and seeing the concern written on MacKinnon's face.

"This ham—is it synthetic, or is it *real meat?*"

"Why, it's real. What about it?"

Dave did not answer. He managed to reach the refreshing room before that which he had eaten departed from him.

Before he left, Magee gave Dave some money with which he could have purchased for him things that he would need in order to take to the hills. MacKinnon protested, but the Fader cut him short. "Quit being a damn fool, Dave. I can't use New American money on the Outside, and you can't stay alive in the hills without proper equipment. You lie doggo here for a few days while Al or Molly picks up what you need, and you'll stand a chance—unless you'll change your mind and come with me?"

Dave shook his head at this and accepted the money.

It was lonely after Magee left. Mother Johnston and Dave were alone in the club, and the empty chairs reminded him depressingly of the men who had been impressed. He wished that Gramps, or the one-handed man would show up. Even Alec, with his nasty temper, would have been company—he wondered if Alec had been punished for resisting the draft.

Mother Johnston inveigled him into playing checkers in an attempt to relieve his evident low spirits. He felt obligated to agree to her gentle conspiracy, but his mind wandered. It was all very well for the senior judge to tell him to seek adventure in interplanetary exploration, but only engineers and technicians were eligible for such billets. Perhaps he should have gone in for science, or engineering, instead of literature, then he might now be on Venus, contending against the forces of nature in high adventure instead of hiding from uniformed bullies. It wasn't fair. No—he must not kid himself; there was no room for an expert in literary history in the raw

frontier of the planets; that was not human injustice, that was a hard fact of nature, and he might as well face it.

He thought bitterly of the man whose nose he had broken and thereby landed himself in Coventry. Maybe he was an "upholstered parasite," after all—but the recollection of the phrase brought back the same unreasoning anger that had gotten him into trouble. Involuntarily he let his cortex drop out of his circuit of consciousness, and he let himself be dominated by his throbbing, emotional thalamus—the "old brain" of his prehistoric, tooth-and-claw ancestors, with its undelayed reactions and unreasoned evaluations. He was glad that he had socked that so-and-so! What right had he to go around sneering and calling people things like that?

He found himself thinking in the same vindictive spirit of his father, although he would have been at loss to explain the connection. As a matter of fact, the connection is not superficially evident, for his father would never have stooped to name-calling. Instead, he would have offered the sweetest of smiles and quoted something nauseating in the way of sweetness and light. For Dave's father was one of the nastiest little tyrants that ever dominated a household under the guise of loving kindness. He was of the more-in-sorrow-than-in-anger, this-hurts-me-more-than-it-does-you-son school, and all his life had invariably been able to find an altruistic rationalization for always having his own way. Convinced of his own infallible righteousness, he had never valued his son's point of view on anything, but had dominated him in everything—always from the highest moralistic motives.

He had had two main bad effects on his son: The boy's natural independence, crushed at home, rebelled blindly at every sort of discipline, authority, or criticism which he encountered elsewhere and subconsciously identified with the not-to-be-criticized paternal authority. And secondly, through years of association he imitated his father's most dangerous social vice—that of passing unself-critical moral judgments on the actions of others.

When Dave was arrested for breaking a basic custom; to wit, atavistic violence; his father washed his hands of him with the statement that he had tried his best to make a man of him, and could not be blamed for his son's failure to profit by his instruction.

A FAINT KNOCK caused them to put away the checkerboard in a hurry. Mother Johnston paused before answering. "That's not our knock," she considered, "but it's not loud enough to be the nosies. Be ready to hide."

MacKinnon waited by the fox hole where he had hidden the night before, while Mother Johnston went to investigate. He heard her unbar and unlock the upper door, then she called out to him in a low but urgent voice, "Dave! Come here, Dave—hurry!"

It was Fader, unconscious, with his own bloody trail behind him.

Mother Johnston was attempting to pick up the limp form. MacKinnon crowded in, and between the two of them they managed to get him downstairs and to lay him on the long table. He came to for a moment as they straightened his limbs. "Hi, Dave," he whispered, managing to achieve the ghost of his debonair grin, "somebody trumped my ace."

"You keep quiet!" Mother John-

ston snapped at him, then in a lower voice to Dave, "Oh, the poor darling— Dave, we must get him to the doctor."

"Can't . . . do . . . that," muttered the Fader. "Got . . . to get to the . . . gate—" His voice trailed off. Mother Johnston's fingers had been busy all the while, as if activated by some separate intelligence. A small pair of scissors, drawn from some hiding place about her large person, clipped away at his clothing, exposing the superficial extent of the damage. She examined the trauma critically.

"This is no job for me," she decided, "and he must sleep while we move him. Dave, get that hypodermic kit out of the medicine chest in the 'fresher."

"No, mother!" It was Magee, his voice strong and vibrant. "Get me a pepper pill. There's—"

"But, Fader—"

He cut her short. "I've got to get to the doctor, all right, but how the devil will I get there if I don't walk?"

"We would carry you."

"Thanks, mother," he told her, his voice softened, "I know you would—but the police would be curious. Get me that pill."

Dave followed her into the 'fresher and questioned her while she rummaged through the medicine chest. "Why don't we just send for a doctor?"

"There is only one doctor we can trust, and that's *the* doctor. Besides, none of the others are worth the power to blast them."

Magee was out again when they came back into the room. Mother Johnston slapped his face until he came around, blinking and cursing. Then she fed him the pill.

The powerful stimulant, esoteric offspring of common coal tar, took hold almost at once. To all surface appearance Magee was a well man. He sat up and tried his own pulse, searching it out in his left wrist with steady, sensitive fingers. "Steady as a metronome," he announced, "the old ticker can stand that dosage, all right."

Magee waited while Mother Johnston applied sterile packs to his wounds, and then said good-by. MacKinnon looked at Mother Johnston. She nodded.

"I'm going with you," he told the Fader.

"What for? It will just double the risk."

"You're in no fit shape to travel alone—stimulant or no stimulant."

"Nuts. *I'd* have to look after *you.*"

"I'm going with you."

Magee shrugged his shoulders and capitulated.

Mother Johnston wiped her perspiring face and kissed both of them.

UNTIL they were well out of town their progress reminded MacKinnon of their nightmare flight of the previous evening. Thereafter they continued to the north-northwest by a highway which ran toward the foothills, and left the highway only when necessary to avoid the sparse traffic. Once they were almost surprised by a police patrol car, equipped with black light and almost invisible, but the Fader sensed it in time, and they crouched behind a low wall which separated the adjacent field from the road.

Dave inquired how he had known the patrol was near. Magee chuckled. "Damned if I know," he said, "but I believe I could smell a cop staked out in a herd of goats."

The Fader talked less and less as the night progressed. His usually untroubled countenance became

lined and old as the effect of the drug wore off. It seemed to Dave as if this unaccustomed expression gave him a clearer insight into the man's character—that the mask of pain were his true face rather than the unworried features Magee habitually showed the world. He wondered for the *n*th time what the Fader had done to cause a court to adjudge him socially insane.

This question was uppermost in his mind with respect to every person he met in Coventry. The answer was fairly obvious in most cases; their types of instability were gross and showed up at once. Mother Johnston had been enigma until she had explained it herself. She had followed her husband into Coventry. Now that she was a widow she preferred to remain with the friends she knew and the customs and conditions she was adjusted to, rather than change for another and possibly less pleasing environment.

Magee sat down beside the road. "It's no use, kid," he admitted, "I can't make it."

"The hell we can't. I'll carry you."

Magee grinned faintly.

"No, I mean it," Dave persisted. "How much farther is it?"

"Matter of two or three miles, maybe."

"Climb aboard." He took him pickaback and started on.

The first few hundred yards were not too difficult; Magee was forty pounds lighter than Dave. After that the strain of the additional load began to tell. His arms cramped from supporting Magee's knees; his arches complained at the weight and the unnatural load distribution; and his breathing was made difficult by the clasp of Magee's arms around his neck.

Two miles to go—maybe more. Let your weight fall forward and your foot must follow it, else you fall to the ground. It's automatic—as automatic as pulling teeth. How long is a mile? Nothing in a rocketship, thirty seconds in a pleasure car, a ten-minute crawl in a steel snail, fifteen minutes to trained troops in good condition. How far is it with a man on your back, on a rough road, when you are tired to start with?

Five thousand two hundred and eighty feet—a meaningless figure. But every step takes twenty-four inches off the total. The remainder is still incomprehensible—an infinity. Count them. Count them till you go crazy—till the figures speak themselves outside your head, and the jar!—jar!—jar! of your enormous, benumbed feet beats in your brain. Count them backward, subtracting two each time—no, that's worse; each remainder is still an unattainable, inconceivable figure.

His world closed in, lost its history and held no future. There was nothing, nothing at all but the torturing necessity of picking up his foot again and placing it forward. No feeling but the heartbreaking expenditure of will necessary to achieve that meaningless act.

MacKinnon was brought suddenly to awareness when Magee's arms relaxed from around his neck. He leaned forward and dropped to one knee to keep from spilling his burden, then eased it slowly to the ground. He thought for a moment that the Fader was dead—he could not locate his pulse, and the slack face and limp body were sufficiently corpselike, but he pressed an ear to Magee's chest and heard with relief the steady *flub-dub* of the heart.

He tied Magee's wrists together with his handkerchief and forced his own head through the encircled arms. But he was unable, in his exhausted condition, to wrestle the slack weight into position on his back.

Fader regained consciousness while MacKinnon was struggling. His first words were, "Take it easy, Dave. What's the trouble?"

Dave explained. "Better untie my wrists," advised the Fader, "I think I can walk for a while."

And walk he did, for nearly three hundred yards, before he was forced to give up again. "Look, Dave," he said after he had partially recovered, "did you bring along any more of those pepper pills?"

"Yes—but you can't take any more dosage. It would kill you."

"Yeah, I know—so they say. But that isn't the idea—yet. I was going to suggest that you might take one."

"Why, of course! Good grief, Fader, but I'm dumb."

Magee seemed no heavier than a light coat, the morning star shone brighter, and his strength seemed inexhaustible. Even when they left the highway and started up the cart trail that led to the doctor's home in the foothills, the going was tolerable and the burden not too great. MacKinnon knew that the drug burned the working tissue of his body long after his proper reserves were gone, and that it would take him days to recover from the reckless expenditure, but he did not mind. No price was too high to pay for the moment when he at last arrived at the gate of the doctor's home—on his own two feet, his charge alive and conscious.

MacKinnon was not allowed to see Magee for four days. In the meantime, he was encouraged to keep the routine of a semi-invalid himself in order to recover the twenty-five pounds he had lost in two days and two nights, and to make up for the heavy strain on his heart during the last night. A high caloric diet, sun baths, rest, and peaceful surroundings, plus his natural good health, caused him to regain weight and strength rapidly, but he "enjoyed ill health" exceedingly because of the companionship of the doctor himself—and Persephone.

Persephone's calendar age was fifteen. Dave never knew whether to think of her as much older or much younger. She had been born in Coventry, and had lived her short lift in the house of the doctor, her mother having died in childbirth in that same house. She was completely childlike in many respects, being without experience in the civilized world Outside, and having had very little contact with the inhabitants of Coventry, except when she saw them as patients of the doctor. But she had been allowed to read unchecked from the library of a sophisticated and protean-minded man of science. MacKinnon was continually being surprised at the extent of her academic and scientific knowledge—much greater than his own. She made him feel as if he were conversing with some aged and omniscient matriarch, then she would come out with some naïve conception of the outer world, and he would be brought up sharply with the realization that she was, in fact, an inexperienced child.

He was mildly romantic about her. Not seriously, of course, in view of her barely nubile age, but she was pleasant to see, and he was hungry for feminine companionship. He was young enough himself to feel

a continual interest in the delightful differences, mental and physical, between the male and the female of his species. The cockbird strutted and preened his feathers.

Consequently it was a blow to his pride as sharp as had been the sentence to Coventry to discover that she classed him with the other inhabitants of Coventry as a poor unfortunate who needed help and sympathy because he was not quite right in his head.

He was furiously indignant, and for one whole day he sulked alone, but the human necessity for self-justification and approval forced him to seek her out and attempt to reason with her. He explained carefully, with complete emotional candor, the circumstances leading up to his trial and conviction, and embellished the account with his own philosophy and evaluations, then confidently awaited her approval.

It was not forthcoming. "I don't understand your viewpoint," she said. "You did him a very real damage when you broke his nose, yet he had done you no damage of any sort. Apparently you expect me to approve that."

"But, Persephone," he protested, "you ignore the fact that he called me a most insulting name."

"I don't see the connection," she said. "He made a noise with his mouth—a verbal label. If the condition designated by the verbal label does not apply to you, the noise is meaningless. If the noise is a label customarily used to designate a condition which is true in your case—if you *are* the thing that the noise refers to, you are neither more nor less that thing by reason of someone uttering the verbal label. In short, the noise has not damaged you.

"But what you did to him was another matter entirely. You broke his nose. That is damage. In sheer self-protection, the rest of society must seek you out and determine whether or not you are so unstable as to be likely to damage someone else in the future. If you are, you must be quarantined for treatment or leave society—whichever you prefer."

"You think I'm crazy, don't you?" he accused.

"Crazy? Not the way you mean it. You haven't paresis, or a brain tumor, or any other lesion that the doctor could find. But from the viewpoint of your semantic reactions you are as socially *unsane* as any fanatic witch burner."

"Come, now—that's hardly just!"

"What is justice?" She picked up the kitten she had been playing with. "I'm going in—it's getting chilly." And off she went to the house, her bare feet noiseless in the grass.

HAD the science of semantics developed as rapidly as psychodynamics, and its implementing arts of propaganda and mob psychology, the United States might never have fallen into dictatorship, then been forced to undergo the Second Revolution. All of the scientific principles embodied in the Covenant which marked the end of the revolution were formulated as far back as the first quarter of the twentieth century.

But the work of the pioneer semanticists, C. K. Ogden in England and Alfred Korzybski in the United States, were known to but a handful of students, whereas psychodynamics, under the impetus of repeated wars and the frenzy of high-pressure merchandising, progressed by leaps and bounds. It is true that the mathematical aspects of seman-

The cold water of the stream became scalding as the force of the Barrier raged at it. Down he went, down and deeper, and still the blocking energy of the Barrier was deeper—

tics, as developed by Albert Einstein, Eric T. Bell, and others, were well known, even popular, but the charlatans who practiced the pseudoscience of sociology resisted every effort to apply the methods of science to their monopoly.

Semantics, "the meaning of meaning," as Ogden expressed it, or "theory of evaluations," as Korzybski preferred to call it, gave a method for the first time of applying the scientific viewpoint and procedure to every act of everyday life. Because semantics dealt with spoken and written words as a determining aspect of human behavior, it was at first mistakenly thought by many to be concerned only with words and of interest only to professional word manipulators, such as advertising copy writers and professors of etymology. A handful of unorthodox psychiatrists alone attempted to apply it to personal human problems, but their work was swept away by the epidemic mass psychoses that destroyed Europe and returned the United States to the Dark Ages.

The Covenant was the first scientific social document ever drawn up by a man, and due credit must be given to its principal author, Colonel Micah Novak, the same Novak who served as staff psychologist in the revolution. The revolutionists wished to establish in the United States the maximum personal liberty possible for every one. Given the data—the entire social matrix—how could they accomplish that, to a degree of high mathematical probability?

First they junked all previous concepts of justice. Examined semantically, justice has no referent—there is no observable phenomenon in the space-time-matter continuum to which one can point and say, "This is justice." Science can deal only with that which can be observed and measured. Justice is not such a matter; it can never have the same meaning to one as to another; any "noises" said about it will only add to confusion.

But damage, physical or economic, could be pointed to and measured. Citizens were forbidden by the Covenant to damage another, and laws were passed to anticipate such damage. Any act not leading to damage, physical or economic, to some person, they declared to be legal.

As they had abandoned the concept of justice, there could be no rational standards of punishment. Penology took its place with lycanthropy and other forgotten witchcrafts. Yet, since it was not practical to permit a probable source of danger to remain in the community, social offenders were examined and potential repeaters were given their choice of psychological readjustment, or of having society withdraw itself from them—Coventry.

During the formulation of the Covenant, some assumed that the socially unsane would naturally be forced to undergo hospitalization for readjustment, particularly since current psychiatry was quite competent to cure all nonlesioned psychoses and cure or alleviate lesional psychoses, but Novak set his face against this and opposed it with all the power of his strong and subtle intellect. "Not so!" he argued. "The government must never again be permitted to tamper with the mind of any citizen without his consent, or else we set up a means of greater tyranny than we have ever experienced. Every man must be free to accept, or reject, the Covenant, even though we think him insane!"

The next time MacKinnon looked up Persephone he found her in a state of extreme agitation. His own wounded pride was forgotten at once. "Why, my dear," he said, "whatever in the world is the matter?"

Gradually he gathered that she had been present at a conversation between Magee and the doctor, and had heard, for the first time, of the impending military operations against the United States. He patted her hand. "So that's all it is," he observed in a relieved voice. "I thought something was wrong with you yourself."

" 'That's all.' David MacKinnon, do you mean to stand there and tell me that you knew about this and don't consider it worth worrying about?"

"Me? Why should I? And for that matter, what could *I* do?"

"What could you do? You could go Outside and warn them—that's what you could do. As to why you should— Dave, you're impossible!" She burst into tears and ran from the room.

He stared after her, mouth open, then borrowed from his remotest ancestor by observing to himself that women were hard to figure out.

Persephone did not appear at lunch. McKinnon asked the doctor where she was.

"Had her lunch," the doctor told him between mouthfuls. "Started for the gateway."

"What! Why did you let her do that?"

"Free agent. Wouldn't have obeyed me, anyway. She'll be all right."

Dave did not hear the last, being already out of the room, and running out of the house. He found her just backing her little monocycle runabout out of its shed. "Persephone!"

"What do you want?" she asked with a frozen dignity beyond her years.

"You mustn't do this! That's where the Fader got hurt!"

"I am going. Please stand aside."

"Then I'm going with you."

"Why should you?"

"To take care of you."

She sniffed. "As if anyone would dare to touch me."

There was a measure of truth in what she said. The doctor and every member of his household enjoyed a personal immunity unlike that of anyone else in Coventry. As a natural consequence of the set-up, Coventry had almost no competent medical men. The number of physicians who committed social damage was small. The proportion of such that declined psychiatric treatment was negligible, and this negligible remainder were almost sure to be unreliable bunglers in their profession. The doctor was a natural healer, in voluntary exile in order that he might enjoy the opportunity to practice his art in the richest available field. He cared nothing for dry research; what he wanted was patients, the sicker the better, that he might make them well again.

He was above custom and above law. In the Free State the Liberator depended on him for insulin to hold his own death from diabetes at arm's length. In New America his beneficiaries were equally powerful. Even among the Angels of the Lord the Prophet himself accepted the dicta of the doctor without question.

But MacKinnon was not satisfied. Some ignorant fool, he was afraid, might do the child some harm without realizing her protected status. He got no further chance to protest;

she started the little runabout suddenly and forced him to jump out of its path. When he had recovered his balance she was far down the lane. He could not catch her.

PERSEPHONE was back in less than four hours. He had expected that; if a person as elusive as Fader had not been able to reach the gate at night, it was not likely that a young girl could do so in daylight.

His first feeling was one of simple relief, then he eagerly awaited an opportunity to speak to her. During her absence he had been turning over the situation in his mind. It was a foregone conclusion that she would fail; he wished to rehabilitate himself in her eyes; therefore, he would help her in the project nearest her heart—he himself would carry the warning to the Outside!

Perhaps she would ask for such help. In fact, it seemed likely. By the time she returned he had convinced himself that she was certain to ask his help. He would agree—with simple dignity—and off he would go, perhaps to be wounded, or killed, but an heroic figure, even if he failed.

He pictured himself subconsciously as a blend of Sidney Carton, the White Knight, the man who carried the message to Garcia—and just a dash of D'Artagnan.

But she did not ask him—she would not even give him a chance to talk with her.

She did not appear at dinner. After dinner she was closeted with the doctor in his study. When she finally reappeared she went directly to her room. He finally concluded that he might as well go to bed himself.

To bed, and then to sleep, and take it up again in the morning—But it's not as simple as that. The unfriendly walls stared back at him, and the other, critical half of his mind decided to make a night of it. Fool! She doesn't want your help. Why should she? What have you got that Fader hasn't got—and better? To her you are just one of the screw-loose multitude you've seen all around you in this place.

But I'm not crazy! Just because I choose not to submit to the dictation of others doesn't make me crazy. Doesn't it, though? All the rest of them in here are lame brains; what's so fancy about you? Not all of them. How about the doctor, and— Don't kid yourself, chump, the doctor and Mother Johnston are here for their own reasons; they weren't sentenced. And Persephone was born here.

How about Magee? He was certainly rational—or seemed so. He found himself resenting, with illogical bitterness, Magee's apparent stability. Why should he be any different from the rest of us?

The rest of us? He had classed himself with the other inhabitants of Coventry. All right, all right, admit it, you fool. You're just like the rest of them; turned out because the decent people won't have you—and too damned stubborn to admit that you need treatment.

But the thought of treatment turned him cold and made him think of his father again. Why should that be? He recalled something the doctor had said to him a couple of days before: "What you need, son, is to stand up to your father and tell him off."

He turned on the light and tried to read. But it was no use. Why should Persephone care what happened to the people Outside? She didn't know them; she had no friends there. If he felt no obligations to them, how could she pos-

sibly care? No obligations? You had a soft, easy life for many years —all they ask was that you behave yourself. For that matter, where would you be now if the doctor had stopped to ask whether or not he owed you anything?

He was still wearily chewing the bitter cud of self-examination when the first cold and colorless light of morning filtered in. He got up, pulled a robe around him and tiptoed down the hall to Magee's room. The door was ajar. He stuck his head in and whispered, "Fader. Are you awake?"

"Come in, kid," Magee answered quietly. "What's the trouble? No can sleep?"

"No—"

"Neither can I. Sit down and we'll carry the banner together."

"Fader, I'm going to make a break for it. I'm going Outside."

"Huh? When?"

"Right away."

"Risky business, kid. Wait a few days and I'll try it with you."

"No, I can't wait for you to get well. I'm going out to warn the United States!"

Magee's eyes widened a little, but his voice was unchanged. "You haven't let that spindly kid sell you a bill of goods, Dave?"

"No. Not exactly. I'm doing this for myself. It's something I need to do. See here, Fader, what about this weapon? Have they really got something that could threaten the United States?"

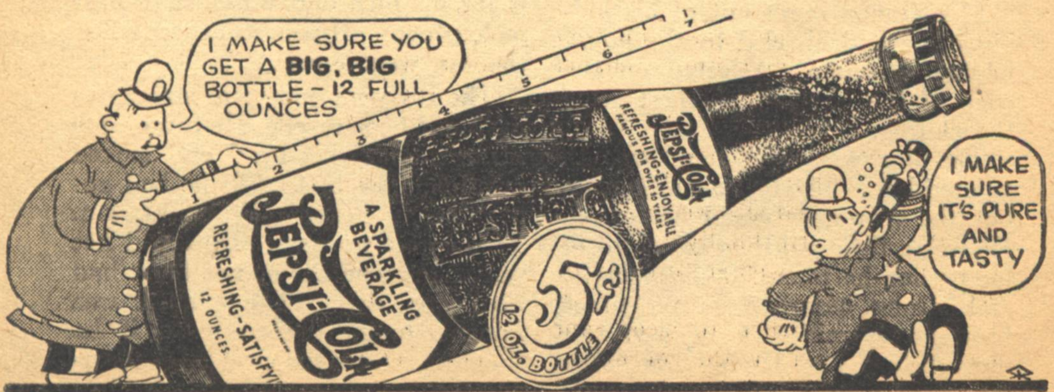
"I'm afraid so," Magee admitted. "I don't know much about it, but it makes blasters look sick. More range. I don't know what they expect to do about the Barrier, but I saw 'em stringing heavy power lines before I got winged. Say, if you do get Outside, here's a chap you might look up; in fact, be sure to. He's got influence." Magee scrawled something on a scrap of paper, folded the scrap and handed it to MacKinnon, who pocketed it absent-mindedly and went on:

"How closely is the gate guarded, Fader?"

"You can't get out the gate; that's out of the question. Here's what you will have to do—" He tore off another piece of paper and commenced sketching and explaining.

Dave shook hands with Magee before he left. "You'll say good-by for me, won't you? And thank the doctor? I'd rather just slide out before anyone is up."

"Of course, kid," the Fader as-



sured him. "Well—watch out for that first step; it's a honey!"

MacKinnon crouched behind the bushes and peered cautiously at the little band of Angels filing into the bleak, ugly church. He shivered, both from fear and from the icy morning air. But his need was greater than his fear. These zealots had food—and he must have it.

The first two days after he left the house of the doctor had been fair enough. True, he had caught cold from sleeping on the ground; it had settled in his lungs and slowed him down. But he did not mind that now, if only he could refrain from sneezing or coughing until the little band of faithful were safe inside the temple. He watched them pass—dour-looking men, women in skirts that dragged the ground, and whose work-lined faces were framed in shawls. The light had gone out of their faces. The very children were sober.

The last of them filed inside, leaving only the sexton in the churchyard, busy with some obscure duty. After an interminable time, during which MacKinnon pressed a finger against his upper lip in a frantic attempt to forestall a sneeze, the sexton, too, entered the grim building and closed the doors.

MacKinnon crept out of his hiding place and hurried to the house he had previously selected on the edge of the clearing, farthest from the church.

The dog was suspicious, but he quieted him. The house was locked, but the rear door could be forced. He was a little giddy at the sight of food when he found it—hard bread and strong, unsalted butter made from goat's milk. A misstep two days before had landed him in a mountain stream. The mishap had not seemed important until he discovered that his food tablets were a pulpy mess. He had eaten them the rest of that day, then mold had taken them and he had thrown the remainder away.

The bread lasted him through three more sleeps, but the butter had melted and he had been unable to carry it. He had soaked as much of it as he could into the bread, then licked up the rest, after which he was very thirsty. He found one more stream, but was forced to leave it when it left the hills and entered cultivated country.

Some hours after the last of the bread was gone he reached his first objective—the main river to which all other streams in Coventry were tributary. Some place downstream it dived under the black curtain of the Barrier, and continued seaward. With the gateway closed and guarded, its outlet constituted the only possible egress to a man unassisted.

In the meantime it was water, and the thirst was upon him again, and his cold was worse. But he would have to wait until dark to drink; there were figures down there by the bank—some in uniform, he thought. One of them made fast a little skiff to a landing. He marked it for his own and watched it with jealous eyes. It was still there when the sun went down.

The early-morning sun struck his nose and he sneezed. He came wide awake, raised his head and looked around. The little skiff he had appropriated floated in midstream. There were no oars. He could not remember whether or not there had been any oars. The current was fairly strong; it seemed as if he should have drifted clear to the Barrier in the night. Perhaps he had

passed under it—no, that was ridiculous.

Then he saw it, less than a mile away, black and ominous—but the most welcome sight he had seen in days. He was too weak and feverish to enjoy it, but it renewed the determination that kept him going.

The little boat scraped against bottom. He saw that the current at a bend had brought him to the bank. He hopped awkwardly out, his congealed joints complaining, and drew the bow of the skiff up onto the sand. Then he thought better of it, pushed it out once more, shoved as hard as he was able and watched it disappear around the meander. No need to advertise where he had landed.

He slept most of that day, rousing himself once to move out of the sun when it grew too hot. But the sun had cooked much of the cold out of his bones, and he felt much better by nightfall.

Although the Barrier was only a mile or so away, it took most of the night to reach it by following the river bank. He knew when he had reached it by the clouds of steam that rose from the water. When the sun came up he considered the situation. The Barrier stretched across the water, but the juncture between it and the surface of the stream was hidden by billowing clouds. Some place, down under the surface of the water—how far down he did not know—somewhere down there the Barrier ceased, and its raw edge turned the water it touched to steam.

Slowly, reluctantly and most unheroically, he commenced to strip off his clothes. The time had come and he did not relish it. He came across the scrap of paper that Magee had handed him, and attempted to examine it. But it had been pulped by his involuntary dip in the mountain stream and was quite illegible. He chucked it away.

He shivered as he stood hesitating on the bank, although the sun was warm. Then his mind was made up for him; he spied a patrol on the far bank.

Perhaps they had seen him; perhaps not. He dived.

Down, down, as far as his strength would take him. Down, and try to touch bottom, to be sure of avoiding that searing, deadly base. He felt mud with his hands. Now to swim under it. Perhaps it was death to pass under it, as well as over it; he would soon know. But which way was it? There was no direction down here.

He stayed down until his congested lungs refused. Then he rose part way and felt scalding water on his face. For a timeless interval of unutterable sorrow and loneliness he realized that he was trapped between heat and water—trapped under the barrier.

Two private soldiers gossiped idly on a small dock which lay under the face of the Barrier. The river which poured out from beneath it held no interest for them, they had watched it for many dull tours of guard duty. An alarm clanged behind them and brought them to alertness. "What sector, Jack?"

"This bank. There he is now—see!"

They fished him out and had him spread out on the dock by the time the sergeant of the guard arrived. "Alive or dead?" he inquired.

"Dead, I think," answered the one who was not busy giving artificial resuscitation.

The sergeant clucked in a manner incongruous to his battered face and

said, "Too bad. I've ordered the ambulance; send him up to the infirmary, anyhow."

THE NURSE tried to keep him quiet, but MacKinnon made such an uproar that she was forced to get the ward surgeon.

"Here! Here! What's all this nonsense?" the medico rebuked him, while reaching for his pulse.

Dave managed to convince him that he would not quiet down, not accept a soporific until he had told his story. They struck a working agreement that MacKinnon was to be allowed to talk—"But keep it short, mind you!"—and the doctor would pass the word along to his next superior, and in return Dave would submit to a hypodermic.

The next morning two other men, unidentified, were brought to MacKinnon by the surgeon. They listened to his full story and questioned him in detail. He was transferred to corps area headquarters that afternoon by ambulance. There he was questioned again. He was regaining his strength rapidly, but he was growing quite tired of the whole rigmarole, and wanted assurance that his warning was being taken seriously. The latest of his interrogators reassured him. "Compose yourself," he told Dave, "you are to see the commanding officer this afternoon."

The corps area commander, a nice little chap with a quick, birdlike manner and a most unmilitary appearance, listened gravely while MacKinnon recited his story for what seemed to him the fiftieth time. He nodded agreement when David finished. "Rest assured, David MacKinnon, that all necessary steps are being taken."

"But how about their weapon?"

"That is taken care of—and as for the Barrier, it may not be as easy to break as our neighbors think. But your efforts are appreciated. May I do you some service?"

"Well, no—not for myself, but there are two of my friends in there—" He asked that something be done to rescue Magee, and that Persephone be enabled to come out if she wished.

"I know of that girl," the general remarked. "We will get in touch with her. If at any time she wishes to become a citizen, it can be arranged. As for Magee, that is another matter—" He touched the stud of his desk visiphone. "Send Captain Randall in."

A neat, trim figure in the uniform of a captain of the United States army entered with a light step. MacKinnon glanced at him with casual, polite interest, then his expression went to pieces. "Fader!" he yelled.

Their mutual greeting was hardly sufficiently decorous for the sanctum sanctorum of a commanding general, but the general did not seem to mind. When they had calmed down, MacKinnon had to ask the question uppermost in his mind. "But see here, Fader, all this doesn't make sense—" He paused, staring, then pointed a finger accusingly, "I know! You're in the Secret Service!"

The Fader grinned cheerfully. "Did you think," he observed, "that the United States army would leave a plague spot like that unwatched?"

The general cleared his throat. "What do you plan to do now, David MacKinnon?"

"Eh? Me? Why, I don't have any plans—" He thought for a moment, then turned to his friend. "Do you know, Fader, I believe I'll turn in for psychological treatment,

after all. You're on the Outside—"

"I don't believe that will be necessary," interrupted the general gently.

"No? Why not, sir?"

"You have cured yourself. You may not be aware of it, but four psychotechnicians have interviewed you. Their reports agree. I am authorized to tell you that your status as a free citizen has been restored, if you wish it."

The general and Captain "the Fader" Randall managed tactfully between them to terminate the interview. Randall walked back to the infirmary with his friend.

Dave wanted a thousand questions answered at once. "But, Fader," he demanded, "you must have gotten out before I did."

"A day or two."

"Then my job was unnecessary!"

"I wouldn't say that," Randall contradicted. "I might not have gotten through. As a matter of fact, they had all the details before I reported. There are others—Anyhow," he continued, to change the subject, "now that you are here, what will you do?"

"Me? It's too soon to say. It won't be classical literature, that's a cinch. If I wasn't such a dummy in math I might still try for interplanetary."

"Well, we can talk about it tonight," suggested Fader, glancing at his telechronometer. "I've got to run along, but I'll stop by later and we'll go over to the mess for dinner."

He was out the door with an easy speed that was nostalgic of the thieves' kitchen.

Dave watched him, then said suddenly, "Hey! Fader! Why couldn't I get into the Secret Ser—"

But the Fader had gone—he must ask himself.

INTRODUCTION TO ANOTHER NAMELESS SCIENCE

"Biological Engineering," some of the universities call it. It has to do with the invention, design and construction of instruments for measuring biological data, being a sort of cross between electrical engineering, radio engineering, physics and biology.

Biological Engineering it's called up at M. I. T., where the men at work are devising, among other things, a recording oscillograph—that part isn't new—which will not only make a permanent record on film, but will permit the operator of the gimcrack (the inventor's own term for what some people call gadgets and others call widgets) to see what he's recording. Seems biologists get excessively annoyed when they set up an experiment, go through it, carefully recording it but not knowing just what it is that's being recorded, then have to wait an hour or so for the record. That's when they find the thing didn't work right in the first place because a wire had come loose, or some similar catastrophe.

But the problems to be solved are many, and the methods of attack are yet to be worked out. One thing; man's been using muscle-power for some few years now—and he still doesn't have more than a foggy notion of how it works. For one thing, a muscle-cell can only pull on a yes-or-no basis—there's no gentle pull possible for a single cell. Furthermore, a muscle-stimulating nerve-fiber has a similar all-or-nothing reaction. Then how is it that muscles can pull gently, or with surprising force?

Wanted; a widget, gadget or gimcrack capable of determining how a muscle works!

THE IDEALIST

By Kurt von Rachen

Illustrated by R. Isip

Idealists generally make revolutions—and either die in them, or are condemned by the men they fought for!

Author's Note:

This is not a chronicle of that chaos which befell the Earth in fatal February, 2893; for it would require a far more brutal pen than mine and a far longer story than this to record the political and moral debacle which ended the Last Aristocracy. It is not to be regretted that decadent profligates, such as the Eighty Great Names contained, found unmerciful death in the

scorching frenzy of a maddened mass; the only regrettable thing is a law, seemingly inviolable, which states that the method of government cannot be changed no matter how many rulers are slain.

When a billion despised and beaten workmen lifted their unshaven faces to give vent to the hideous marching song of the revolt, there were those among them who dreamed an idyllic ideal. No pity to the brawling clods who scarce knew that they lived! No pity to the drunken beasts who had abused rule for three centuries! Pity instead the idealist who discovered that he had placed power in the hands of an untutored mass who, inured to the foulness and bigotry of the Eighty Great Names, carried forward along the very principles which they had avowed to destroy. For a century, Justice had been a bland-faced mockery—the mass turned it into a careless buffoon.

Pity, then, the idealist, the human being who, by some strange chemistry, was born gentleman in face and figure and worker in name. The ranks of the Enlightened People's Party held many such as this, men who tenaciously gripped light and reason to their breasts until the bullets of firing squads put out all their light and all their reason forever. Such men were the supporters of those unbelievably airy dreamers, the Anarchist Alliance. Like a round table of King Arthur they judged the world by themselves and failed to recognize the brutalizing effect of the Eighty Great Names upon an uneducated and vengeful people.

The first slaughter was small compared to the second. Once set burning, passions caught from man to man and human life became, out of habit, something to destroy. With the Eighty Great Names stacked in a hundred and eighty sodden piles, the Anarchist Alliance, under the direction of very able scholars, sought to reform the new government into a lasting formula for contentment. But this effort was antagonistic to the Enlightened People's Party for the leaders were power-crazed and lustful in their orgy of death. The Anarchist Alliance and the Communist regime parted. The latter was more numerous by ninety-five to one and it was therefore a simple matter for the Enlightened People's Party to single out and order executed any man who might possibly menace the Communist leaders.

Wholesale destruction steamrolled the Anarchist Alliance. Even so, there were a few, too powerful in friends to be murdered outright, who received the lingering death of the concentration camps and colonies around the System and in Outer Space.

Pity the poor idealist! The only man who could have founded a lasting contentment for Earth! For the ideal and the man must always genuflect before the avarice and personal terror of the unshaven clowns who, to the peal of the devil's laughter, controls the crowd and sweeps it onward to greater follies. Stupidity and cupidity unfortunately rhyme.

KURT VON RACHEN

HE threw up his hands to protect his wounded face from the elbows and shoulders of the crowd. It was like drowning, being flung into this motion and sound. It was drowning, for drowning, too, is death. The place stunk of sweat and stale powder smoke and gangrene.

Revolution, thought Steve Gailbraith, didn't begin to kill until it was done.

The shiny courtroom walls, so lately adorned with statues symbolizing Justice and Mercy, were dotted and slashed with slugs and shrapnel, seared and crumpled with rays, and discolored by strangling gas. Pieces of furniture crunched underfoot. The crowd surged this way and that, now a vast roar of obscene delight, then a howling wolf pack athirst for new blood. Where no commoner had stood before except under arrest, commoners now made a vicious holiday. Each new sentence was greeted with "Forever to Fagar, the Deliverer!"

A man could die here, thought Steve, and never be discovered even if he began to stink. His wits were dulled by the swirling bedlam until it took great effort for him to see, or think, or feel anyone. He writhed with disgust for this thing he had helped bring about.

There was expectant lust in the faces which saw him push past. But the prisoners ahead had no interest in

anything. The guard shoved him into a seat and tramped away to fetch more meat for the firing squad. Steve dabbed at his bleeding face with a ragged sleeve. The glint of torn braid about his wrist caught his eye for an instant and he grinned.

Colonel Steve Gailbraith.

Long live the Revolution!

There were other uniforms to the right and left, but just now the prisoner's box was jammed, in the main, with civilians—eight or nine women, men with the ascetic faces of scholars, hefties with a truculent swagger—

Evidently, thought Steve, they were running out of military criminals and easing off into counterrevolutionists. It was about time they started shooting some civilians.

The high bench was spread with the elbows of the judges. They sat in comfortable indifference and passed judgment without bothering to look or listen. Even murder, thought Steve, gets to be a habit.

The chief judge was an insolent rogue whose face consisted of unshaven folds of fat and a pair of lewd eyes. He had on a grimy suit of workman's slipovers and a borer's lantern cap; his hands were like lumps of lard and his paunch so soft that the bench dented it. For eight days Guis had been sitting there with his cohorts dispensing with those who had aided, but now might obstruct, the new governmental system which had swept the Continent from Frisco to New York with a blood-stained broom.

Two factions of workers, one Communistic and the other Anarchistic, had united to wipe out the mental aristocracy which had abused its workmen and slaves. And then the Communistic faction, the stronger, had found its expedient to cancel out the Anarchistic partner. With the aristocracy lying in congealed clots at crossroads throughout the land, the Enlightened People's Government found it simple to increase the heaps with Anarchistic corpses. It was being done smoothly. The people had not yet begun to realize that Anarchist and counterrevolutionist were being made synonymous. It would not do to excite the people too much. There were even Anarchists who could not be touched because of their great popularity.

Communism, thought Steve, is a method of repaying service with death. When he, as a member of the Anarchistic party's better element—which also included most of the brains in the land—had taken over the temporary government of California, he had supposed his own popularity sufficient to protect him. But when he had seen fit to spare a few aristocratic families, he had been disabused of his own invulnerability.

Ah, well, thought Steve, it was too swift a rise anyway. What goes up— And he had gone up. From an air-force lieutenant he had zoomed to a colonelcy and, having done spectacular work in the revolt, his colonelcy had resulted in a governorship.

And here he sat watching Judge Guis gnaw a Havana with snagged teeth and spit out sentences amid clouds of smoke. It was unlikely that Guis caught half the names tossed up to him by cringing lawyers.

"Professor Jean Mauchard," barked the clerk. "Accused of heading the organization known as the Sons of Wisdom, said organization having been found guilty of plotting to sustain a counterrevolutionary program—"

Jean Mauchard was a straight,

stiff fellow, thirty and disdainful. His lip was curled as he spoke up at Guis. "Guilty. Firing squad."

Guis stopped grinning and removed the cigar. He leaned forward to better view the prisoner. "Is that mockery, my fine *scientist?*"

"I save you your wind," said Jean Mauchard. "I wonder that you do not get a parrot to keep blatting those words for you."

Guis almost got angry and then, sitting back, he replaced the cigar. "No parrot for you, *scientist*. You Anarchists have very strange ideas, but you are not without your points. I have been waiting for your case. You are, I think, leader of the Sons of Wisdom?"

"Correct."

"That outfit of disaffected aristocrats, composed of men with too many formulas and too few brains. Guis chuckled at his own wit and some of the other judges grinned down at Jean Mauchard.

Guis whispered to his cohorts on either side, and they whispered down the line. The grins increased.

They are relieved, thought Steve. I wonder what hell stew they're cooking now. They wouldn't dare shoot Jean Mauchard out of hand. But there he left the observation, for the confusion of the place made his already aching head spin. People in the box were jostling him and the guards had hurled several new prisoners in and the clerk was bellowing for more fodder.

When Steve next glanced toward the high bench it was in reply to a call for a name as familiar as Jean Mauchard's.

"Dave Blacker!"

A husky buccaneer was made to obey the summons. A guard thrust Dave Blacker toward the high bench and then, suddenly, the guard went loping into the crowd and Dave Blacker ostentatiously dusted his hands and settled his loud topcoat about his hulking shoulders. He swaggered up before the bench.

"I'm Dave Blacker, you pot warmer. And when you sing for me again, say it slow and respectful. I'm Dave Blacker, get it? D-A-V-E, Dave; B-L-A-C-K-E-R, Blacker. And when I roar a hunnert thousand men cheer their heads off. If you got business with me, get it out and get it done because this place stinks and you stink and when I want to wallow with hogs I'll go find some hogs more to my liking. Get going, Guis. You're goin' to charge me with sedition, mayhem and immorality—*if* you've got the nerve."

Guis removed the cigar for the second time that day. His shapeless lips were lopsided on his face. "You may be Dave Blacker in the West, but here in Washington you're a renegade that's guilty of plotting to overthrow the Enlightened People's Government. *Once* a hunnert thousand of your brick-tossing hefties might have cheered you to a man, but right now, when you talk about things stinking, take a smell of this pile of evidence against you!"

Dave Blacker spat and crossed his arms. "Shoot me, you dollar-a-day-mucker, and you'll have to shoot half the longshoremen on the Pacific Coast. We done our part in this scrap and we can do plenty more."

Another judge leaned toward and whispered to Guis and then all the judges began to hiss like a platoon of snakes. Some of them appeared worried, but soon Guis wiped away their frowns. Whatever he proposed pleased them very much for two or three laughed outright.

"Blacker," said Guis, "we brought you here to test your metal. We've got a job for you. A big job. You and some three hundred of your

men. And"—here Guis could barely suppress his own guffaws—"we're got a job for Mauchard. For Mauchard and his people. A job for the two of you."

"I'm not takin' no job with Mauchard!" roared Blacker, abruptly enraged by the mere thought of close contact with those devils, the scientists, who had sought to oust the honest laboring element from the Anarchists and dominate the show—a move which had resulted in the weakening and now the loss of all Anarchistic power to the death of thousands.

"Nor I with scum like Blacker," said Jean Mauchard with a chill glare in the labor leader's direction.

"Oh, but I'm sure you'll both like this job," said Guis. "We mean to honor you. Why, we're not even going to transport you to the labor colonies. We're going to give you a colony of your own. And on a beautiful planet. We're going to give you supplies and equipment. You gentlemen are valuable assets to our civilization and you can't be spared. Yes, that is what we are going to do. Jean Mauchard and Dave Blacker, you are going to head your respective groups in the colonization of Sereon of Sirius. You'll leave tomorrow morning."

Before they could vent the violence of their protests, the clerk was bawling "Stephen Gailbraith!"

STEVE was pulled out of the box and thrust against the front wall of the bench. He was getting used to being thrust about and so he merely straightened his tattered tunic and looked up at Guis with an amused and tolerant smile.

"Gailbraith," read the clerk. "Colonel, air force. As emergency governor of California, spared lives of aristocracy, compromised with subversive element and generally acted contrary to the best interests of the people."

"Guilty," said Guis. "Firing—Wait a moment. You have a familiar face, whatever-your-name-is."

"Gailbraith."

"Oh, yes. Colonel Gailbraith. You took San Francisco about five months ago, didn't you? Good piece of work even if you are a counterrevolutionist now. I suppose—well, you must have quite a few friends in the army, haven't you?"

"A few."

"Ah, yes. A few." Guis whispered to the other judges for a moment, and they all whispered back and nodded. "Colonel Gailbraith, this court is going to be lenient with you. We are going to permit you, because of your extraordinary military skill, to accompany the Sereon Expedition. Next case."

The court clerk intoned, Miss Fredericka Stalton. Miss Fredericka Stalton."

A guard pulled Steve away, and he almost collided with a slight but pretty girl whose face was a study in cold contempt for Guis. But it was a face which leaped out of the pool of faces for only an instant, and then was gone.

The court clerk was reading, "Fredericka Stalton, propagandist for the Anarchist party. Accused of counterrevolutionary—"

Steve Gailbraith was glad to get into the corridor. His head was aching and he felt as if he had been hauled out of a swamp. Expedition to Sereon. With Dave Blacker and Jean Mauchard.

He didn't realize, just then, what a neat way it was of doing away with men who might have had objectors to their outright execution. He wasn't thinking at all. Only half conscious,

he had the strange hallucination of a pretty face set with cold contempt —a face which blurred out and came clear again and hung upon nothingness before him. Vaguely, he wondered about it much as one might wonder about a buzzing fly. Expedition to Sereon. Who cared?

But he did care. And for all his effort to diminish the ache of disappointment by disavowing any interest in present events, his wound alone could not have accounted for the aching lethargy of him; heartbreak alone could have caused that. He was as a man in love whose sweetheart he has discovered to be a harlot. The empty misery of knowing had no balm.

AND THOSE first monotonous days of the voyage to Sereon of Sirius discovered no spark of will to live in Steve Gailbraith. As a soldier and the son of soldiers he had never understood. He had tasted his initial gagging sample of the Eighty Great Names when, as a cadet, he had been ordered to a prison island as an officer of the guard. There he had seen women clubbed into submission by callous R. N. Z. A. guards, and had seen prisoners drown their children rather than bring them up in the incredible squalor and torture of a camp. Men whose only crime had been a deserved curse at an aristocrat were thrown into pens, naked and ill, to be left to starve on garbage which, in itself, was death. He had seen scholars who had refused to swerve from a discovery broken bone by bone by steel-shod rayrifle butts. And there he had witnessed the execution of his own uncle, charged with the writing of inflammatory pamphlets.

There had been born his first disaffection for the Eighty Great Names for, childlike and sincere, he thought it worth his life to attempt to bring freedom to his tortured race. And when he had transferred to the Terrestial Fleet he had spent his days in feeding upon the political sciences and the sociological doctrines. Among the Sons of Wisdom he had gained many friends. Amid the Anarchist Alliance's labor element he had had much respect. And when the clarion cry for liberty had rung around the globe, he had been the first of air-force officers to lead a squadron against the Eighty Great names. He had dreamed, he had fought, he had striven. His banner had been Emancipation.

And now that banner was clotted with the mire of ignorance. And he had won only to find that Fagar, rapacious and stupid, a former slaughterhouse killer of beef, had elevated himself like the resurrected carcass of one of his beeves into the leadership of the world. Fagar, whose brag was that he had never bathed. Fagar, who had disembowled the emperor's wife before the emperor's very eyes. Fagar! The very thought of the man made Steve Gailbraith retch. And Fagar was risen to command this stupid mass of brutes to send down with a crash all the crystal dreams of those very men who had made the revolt possible.

Steve Gailbraith sat with his back to a bulkhead, his arms upon his knees and his face buried in his sleeves. He gave heed to the roaring and trembling of the spaceship no more than he gave heed to the guards or his fellow members, who idled about under the dirty highlight which canopied the promenade with glass.

When he had first come aboard he had bestowed a quiet laugh upon the *Fury*—a laugh without humor, but not without some sympathy. For

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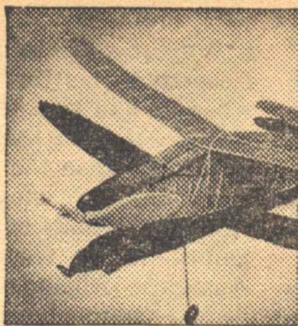

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this very ship had once been flag vessel of the R. N. Z. A. Fleet and proud had been the glowflags upon her sides when she had borne the emperor on his first visit to Mars. How brightly had these bulkheads gleamed, how white had been these decks! How clear the highlight overhead, not barring the light from any star.

Steve Gailbraith had seen the ghost of himself, a sub-liuetenant in flawless plastiron, all blue and girded with golden belts, his thumbs smartly touching his rayrods on either side, his beardless face serious with a child's make-believe seriousness, his whole being rigid and respectful and somehow joyous from glittering helm to winged boot. Eyes straight ahead as the emperor passed. Blushing like a girl when the emperor paused and spoke to him. How thrilled he had been on that voyage, forgetting all his dark unrest, worshiping for once with all his heart before the majesty of pomp and dignity. Ai, the ghost of a child still stood there by the boarding shield, thumbs smartly touching his rayrods on either side. Ai, and the ghost of an emperor strolling upon this deck and pausing to speak with the child.

Ah God, poor *Fury*, Steve Gailbraith had thought. How rusty and dented, how shabby and forlorn with your guns all worn and your tubes decayed and your very glowflags minus half their lights. Outward bound upon a freighter's errand, packed with convicts and hate. The ghost of a ship, the ghost of an emperor and the ghost of a man.

STEVE PRESSED his face more deeply into his bloodstained sleeve. If he could only laugh perhaps this ache of an ideal outraged and betrayed might soften. Why was he not born hard?

"You," said a calculating voice, "are Steve Gailbraith."

He did not look up for a little while even though it was not an unpleasant voice, a woman's. And then when he felt she would not go away, he looked at her. He was not startled, for he had nothing left to be startled about. Rather, he felt somehow enlivened, if only very vaguely. There was a vital flash in her gray eyes which spoke of strength and purpose and passion, all belied by the frailty of a lovely woman and the cold contempt of her face. He knew that he had seen her somewhere, but he was too weary to wonder. Still he felt that he had met her in a dream or a nightmare, and that the memory had been before him for sometime.

"I saw you in the court—or that comedy that passes for one." She was very impersonal about it. "They sentenced me after they sentenced you."

He did not much care, but he remembered something about it now. He was a little annoyed, for he wanted no part of anyone, only the death of his own company. The vibrant force in her wearied him.

"My name is Vicky Stalton," she continued, scarcely looking at him. "You have not heard of me, for I was a member of the benighted Enlightened People's Party and I did not sign my pamphlets. I am not a member of your fancy Anarchist Alliance. I was not born good enough for that—or to associate with you, most likely. I come from the gutter and I've been thrown back. I was cursed with too many wits and too few nobility—legitimately—in my family. So sit there and ignore me if you will for I'm sure I really don't care whether you die or not."

Steve looked at the bandage which wound a red-black coil around her right hand; the red torch insignia, which still held by a thread to her tunic cuff, was almost as smudged. She had evidently begged enough water to wash her face, for it was quite clean and a gleaming curve of blond hair, smoothly brushed, flowed out from under the peaked fatigue cap which she wore aslant over one eye. Yes, he thought dully, he had heard of her before, had seen her on a poster once; the poster had symbolized the first rush of revolutionaires upon Washington and the lower half of it had been scorched by a raygun, leaving a meaningless collection of syllables and the picture of this girl reaching ecstatically toward a flaming torch. Yes, he remembered. Funny that he should. He wished she would go away.

"Now that you have so courteously acknowledged my self-introduction," she said, "I shall answer your question as to why I came and spoke to you."

He moved restively under the sting in her voice. He knew suddenly that she could speak so softly that a man could drown— Why didn't she go away?"

"You and I are the outcasts," she said.

He looked up at her face, scowling a little in lieu of question.

"We are all outcasts in a way, of course," she continued. "But you and I are very choice. You are too good for them. I am too bad. You don't care whether you die or not, and I am sure I don't care if you do, but I am a foolish sort of person. I want to live."

"Why do you say that?"

"WELL!" Vicky Stalton mocked. "It speaks and everything. The blammon on Venus seeks to protect itself by thrusting its head in the mud and leaving its red and green

feathers waving airily in the breeze. And so, blammon, it is I that bring you the news that Dave Blacker is about to blast the Sons of Wisdom into space dust, take command of the *Fury,* and hi-ho for the freedom of Outer Space. For Dave Blacker has just finished a brilliant piece of calculation. We are being sent to Sereon to eat each other up."

"Well?"

"Well, unlike you, my gaudy officer, there are some of us who dislike the idea of dying, and myself in particular finds it abhorrent. Dave Blacker got it from a crew member that the scientists were to be landed with the weapons and the food and, at some distance, Dave Blacker and his hefties are to be set down, empty-handed. No one knows anything about Sereon except that it has atmosphere and a gravity of seven eighths. But it is certain that Dave Blacker and his hefties will have to overcome the scientists or freeze and starve. And because there will be very little food, the scientists will resist with everything they have. Seventeen scientists and three hundred hefties just about add up to a final zero. It is a very humorous plan that Guis evolved and Fagar upheld. And so Dave Blacker, not being without resource, does not intend to land on Sereon. He has a few friends in the crew and so he has a few blasticks and he has called a conference with the Sons of Wisdom under a treacherous truce at four bells in the wardroom. And Jean Mauchard has accepted. Exit, my bravo, Jean Mauchard and the Sons of Wisdom. Exit the *Fury* from the E. P. G.'s fleet. Or am I boring you?"

"Let them fight," said Steve with a tired sigh. "It's all one to me."

"Hah! It's all one to him. And here a beautiful and, I hope, desirable damsel comes seeking his strong arm and he says it's all one to him! Why, you yellow coward, not only are you afraid to live, but you're afraid of Dave Blacker! You! What an officer! No wonder they are transporting you!"

Steve shrugged.

"You genius!" she said. "Can't you see that Dave Blacker hates both of us? Because you are of the military caste and because I escaped from his element and was a factor in the E. P. P.? As soon as he has either killed or intimidated the ship's officers, he'll finish up the job by killing us. Do you think he'd be such a fool as to leave a military expert and a propagandist director, both in opposition to him, alive? I don't care if he shoots you, but by those stars, soldier, I'm going to live!"

Steve looked at her for a little while. The flame of her glance was too violently opposed to his own apathy to do anything but weary him further. Why should he care about dying? Everything he had lived for was slain, and he felt tardy in not following after. It was good news, in truth, that Dave Blacker should aid him in escape with a well-placed shot.

"I might as well be talking to that scoregun!" she said. "And I thought I knew something about psychology!" She waved her hand as though throwing him away, but it was her right hand and a sudden spasm of agony made her clutch it to her and wince. Her voice was not powerful when she spoke again, though she tried to hide the pain. "No, I'm not so good. I could tell muckers and dimers that white was black and they believed me. But then I've never had much chance to practice on the nobility!" And she

faced away and vanished down a hatch which led to the wardroom.

Steve stayed where he was. What was the use? Even if Blacker killed Mauchard and enslaved the ship, Steve would not mention that his own value as having been trained on the *Fury* could not be denied. To hell with Blacker and the *Fury* and that Vicky Stalton. Let them explode in space and whirl with the comets for eternity. It was all one to him.

A FEW MINUTES later, just before four bells were struck, three hefties came lounging along the promenade, their brute faces sly. Everyone had the run of the ship because of the power of the guard weapons and the gifted reasoning of Dave Blacker and so these did not even bother to explain to the marine on guard why they hauled Steve Gailbraith to his feet.

Steve looked at them with bored eyes, resenting a little that they would put their hands upon him.

"The boss wants to see you, soldier," said one to Steve, "and when the boss wants to see people, people generally are seen. Come along."

They shoved him ahead of them down the hatchway and Steve only resisted enough to release himself, after which he walked quietly, not caring. Anything was better than this ache within him. And the newer blasticks were highly efficacious.

The wardroom was not dissimilar to any other battleship's except that, on the *Fury*, it was larger and better appointed as befitted a flag vessel. It had not changed much down the years, though the portrait of the emperor had been crudely cut from its frame and the noble name of the silver service's donor had been scraped from the dishes.

It was amidships and occupied the entire beam save for passage room between it and the outer skin. The furniture was, of course, reversible, ceiling and floor being identical so that, on acceleration the after bulkhead was the floor which, on deceleration became the ceiling. And as they were now accelerating, the furniture was fixed to the wide expanse of after bulkhead. It looked poignantly familiar to Steve, for how many times had he leaned back from his dinner to trace the intricate networks of wires and pipes and cables which appeared to have settled around the place like a snare. It was just a battleship wardroom, designed for efficiency and utility and as unlike a passenger ship's salon as a powerhouse office was unlike a skyhouse.

It had the effect of deepening Steve's melancholy. He had begun his battle fleet career here before his transfer to the air force. How fitting to finish it in the same place. A ghost of a youngster in white gloves stood reporting to the ghost of a captain at the end of the long table.

But Dave Blacker was sitting at that board now. And across from him Jean Mauchard had just seated himself. Some of the lesser leaders of the hefties were ranged on Dave's side of the board and the Sons of Wisdom were taking their places. Dave Blacker and Jean Mauchard were as intent upon one another as a pair of Kilkenny Cats. But other scientists and hefties glanced up when Steve was brought in and their faces registered an almost disinterested dislike. Vicky Stalton, her fatigue cap on the back of her head, was leaning against a transom smoking a cigarette and regarding one and all with aloof disdain. She gave Steve one look and then her face grew even more chill as she turned away.

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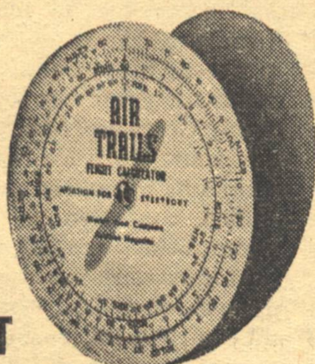

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"Mauchard," said Blacker without preamble. "You know me. I don't monkey around. I brought you down here to arrange a truce. We don't like you and we don't trust you and you don't like us and you don't trust us and, me being Dave Blacker, things happen my way."

"A truce?" said Mauchard with a short, sharp laugh. "With thieves and fools? What of our truce once before, that lost us our power in its breaking? I want no truce with you. If that is why—"

"No," said Dave Blacker with a grin like a wolf's, "that isn't why we brought you down here. We brought you down here to kill you, Mauchard."

The leader of the Sons of Wisdom started to leap up from the board but, in that instant, four blasticks appeared in capable hands. Their hefty holders were completely without expression, only waiting Blacker's command. The scientists were pale.

"So it is to be murder," said Mauchard. "Cold-blooded, calculated." His sensitive face was twisted with scorn. "Murder and mutiny. You gave your word, Dave Blacker, to the captain of this ship that you would not violate parole if he spared us the discomfort of irons and cells. You brought us here today under a white flag. But then, what else can one expect of a dock rat?"

"Better a dock rat," said Dave Blacker, unbothered, "than the illegitimate son of a careless nobleman."

Jean Mauchard winced and went pale. The retreating blood left his lips corpse-blue. But there was fire and hatred in his intelligent eyes which even Blacker could not overlook.

"You are even lower than I had thought," said Mauchard. "It will be a relief, this death you are delivering. A relief from having to

scratch in the crawling company of such vermin. Long ago, when first my friends and I took part in the revolt, I should have known how low we would have to sink to associatae with you."

"So you still think you did us a favor," said Blacker. "Why you bigoted bug killer, when you joined our ranks you came with the idea that you was going to run things as soon as the revolt was done. You and your favors! You had it all figured out that we was going to step out and let you figure a slick government run on slide rules and test tubes and to hell with the human beings. You got psychologists and God knows how many more kinds of ologists, but you ain't got one single drop of honest human blood in the lot of you. What do you care about pain and sufferin' so long as you prove that you can make electrons and brains stand to attention and say 'Yes, sir'!"

"Our knowledge brought about the revolt!" snapped Mauchard.

"And you'd let it wreck the government," said Blacker. "With all your fancy titles and formulas, you ain't got the slightest idea about human beings. You and your gang was pitched out for proposin' to make slaves of every man back on Earth and we was fightin' to keep from bein' slaves any more. Your science ain't got any more heart than the Eighty Great Names!"

"Better science, heart or no heart," said Mauchard, "than to genuflect to sewer sweepings and to be executed for being too strong. You and your ilk twisted and warped all the principles for which we fought. Well! Why talk to a lump of lard? Once on Sereon we'd die at your hands as you would die at ours. It is quicker here and now, for I'm content you'll never make this mutiny stick. So shoot, you and your offal, and be damned to you!"

"The mutiny won't fail," said Blacker with a grin, "but you get the idea about yourselves. It's too bad, Mauchard—"

Steve, at the beginning, had not even been mildly interested. He would be next after the Sons of Wisdom. Vicky Stalton, calmly finishing her cigarette, would probably go immediately after himself. Two outcasts. Outcasts from the soulless gentlemen of science. Outcast from the hulks who had been too violent and brutal even for their own kind. But Steve, at first, cared little. His mind wandered away from the words which crackled between Mauchard and Blacker.

How different it had been in the yesterdays! How different were these men, uncouth and brawling, than others who had been seated at this table.

For the ghost of a stiffly straight child was reporting to the ghost of a captain at that table's head. And the child's braid was brave and his thumbs were precisely lined along his rayrods. How courteous and how formal had this place always been!

When the defeated Martian, Ralgar, wounded and weak, had been yanked from his determination to go down with his shattered *Grrawsly*, he had been brought here. And the *Fury's* singed captain had stood up at the board's end to take Ralgar's hand and congratulate him upon a valiant fight. For the code demanded rigid courtesy even to a vanquishd foe whose guns had crammed the *Fury's* sick bay with wounded and had scarred the battleship's armor until it was a matter of speculation whether it could ever return to its base.

And when Farman had died hurling his vessel against uncountable Venusian odds, choosing suicide rather than retreat, the *Fury's* officers had stood in silence a respectful time before they had drunk to the death of a brave man.

The service. Officers and gentlemen. Proud ships with proud traditions.

Dead, most of them. Ships and traditions and officers alike. Dead because of a slaughterhouse bully, Fagar, who now ruled supreme in the System. Dead because they had either aided or opposed the effort of a people to be free. Dead. For what? So that Fagar could swagger and swear and trammel down all the fineness and intelligence that were left! Dead because they had fought for their ideals and because those very ideals had been besmirched by lies and treachery. And here was the *Fury*, battered and forlorn, rocketing through space on as foul an errand as the warped minds of the E. P. P. could conceive. And there was Blacker, under sentence, but blood brother to the oafs who had succeeded in putting all ideals to the torch. That was what that torch of freedom had turned out to be—a conflagration of everything that was decent in man.

Murder. Here in the wardroom of the *Fury*. Murder and then mutiny and the *Fury's* helm would be befouled by the hands of this criminal crew. And the *Fury's* guns would be turned to the account of piracy.

The ghost of a child, brave in blue and scarlet, face paled with disgust and rage, leaned back against the bulkhead.

"It's too bad," Blacker was saying. "But we don't like you, Mauchard." He turned to his raymen.

But suddenly all were crushed into their chairs and their faces went pasty as the blood rushed from their heads. Their arms were too heavy to lift and those who had been leaning forward were shoved face down upon the board. Those who had been standing sank stubbornly to the floor and lay there, gasping. Steve, too, went down, weighing nearly half a ton. Vicky Stalton had dropped beside her chair.

THREE MARINES with antiacceleration belts forced the door mechanism and came floating in, ready to take battle stations. The lieutenant that followed them looked in wonder at the blasticks which were pressed in plain sight upon the table and could not be moved by their wielders. The lieutenant walked down the top of the table and, with his hook, scooped up the weapon.

Gongs were going through the whole battleship and several more officers and men en route fore or aft, stopped and heard the lieutenant's comment and then went hurrying on.

Shortly the terrible pressure ceased and the stricken ones began to breathe once more, flopping weakly and dizzily as they came erect.

A bull-voiced exec who, in this moment forgot that, as an officer, he ought to consult the soldiers' and sailors' council before deciding anything, came thundering into the wardroom and vented his wrath.

"What the double-banked haggus are you badgers doing?" he roared. "Blasticks! And on my ship!" He glared all around and was about to resume when a messenger came with a matter of greater concern.

"Aft lookout says he did not signal, sir. He swears it."

"What? Why, I'll stripe—" And then the exec remembered that times

and the battle fleet had change. "Is he sure?"

"Yes, sir. And there's no signal light on his buzzer, sir."

The exec looked piercingly around him. He began to see a connection between the false signal and these blasticks. "Listen, you transports! I've been white. The skipper has been white. And what pay do we get for it. Somebody signaled a double buzz on the aft lookout's meteor warning. And that somebody is in this room! How he did it, I don't know—"

"I know," said the lieutenant, coming back from the wall. "The insulation is all frayed on that buzzer cable. Somebody leaned up against it and shorted it."

"Maybe!" said the exec. "But we've got little enough fuel without wasting it on acceleration to get away from a meteor that wasn't even chasing us, much less existed! All right. I'll grant that it was an accident. Even though two buzzes was the proper signal, it would take a genius to know which wire was which in all this maze. Well! So there was murder and mutiny brewing in here, was there? Master at arms! Get me irons. Plenty of irons. Until we get these hyenas landed we'll be damned certain we can keep a finger on them. Quick, now."

Steve submitted gracefully and the man who affixed the irons to his wrists and ankles did not even glance at his face.

A little while later Vicky Stalton edged close to him. She did not express cold contempt now. "I am sorry. It was wicked of me to play upon your emotions as I did—"

Steve laughed brittly. "Dear lady, you had little enough to do with that."

"You mean you deny that your mood—"

"My mood," said Steve Gailbraith, "seems to have changed. There were ghosts in this room."

He would have gone, but she held him back and made him face her. "I . . . I don't understand you."

Steve shrugged and attempted to be careless about it, but small lights of anger were in his eyes where only misery and resignation had been before. "Could I stand idle, seeing hogs wallow where kings have trod? I've been a fool. I helped lift up an order even worse than that which existed before. Had those idiotic idealists like myself worked less for the cause, all that was worth while in this world might not have been blackened out."

There was a hard twist to his face now and a tenseness of purpose in him which reacted upon her like an electric shock. "I was an idealist," he continued. "God help me! I thought that perfection could be attained, that people could be free. But the only freedom a people can enjoy is brought upon by a strong and merciful power, not by self rule, a thing for which they are not equipped. By holding ideals I blinded myself to the quality of those with whom I had to deal. But that is done. I was sick. Now I am well."

"I thought—" she began.

"You thought wrongly. I am cured by the poison itself. You are a very clever girl, no doubt. But limit your tricks to telling your muckers and dimers that white is black. I am not blind—now."

She seemed to be seeing him for the first time, and she had an uncanny illusion of a helmet upon his head and a gun in his hand and battle in his eyes. And when he walked away she seemed to hear, far, far off, a voice saying, "The end has come, Fagar."

THE SCIENCE OF WHITHERING

By L. Sprague de Camp

Illustrated by Schneeman

Given: the world's going, so it must be going somewhere. Question is, whither? An article on various learned guesses as to how man's efforts trend.

So you want to know what I mean by that outlandish title for my article, eh? I thought you would; that's why I picked it. The dictionary gives "whithering" as having the meaning of "hurrying, trembling, tottering, hurling." But I am using the word in an entirely different sense, as referring to the actions of people who go around saying "Whither Civilization?" or "Whither the British Empire?" or "Whither Capitalism?" Or even "Whither Montclair, New Jersey?"

For twenty-five hundred years or so, men—some of them the most intelligent men of their times—have been asking each other, in effect: "What is going to happen to us, to our country, or to civilization?" With so much whithering going on for so long, a science of whithering ought to have been worked out.

If there were such a science, what would it be like? It would have a body of observable facts, and would overlap with history, anthropology, sociology, economics, vital statistics, and perhaps one or two other sciences. Students of the science should be able to observe uniformities among these facts, deduce laws from these uniformities, and from the laws make predictions that are later borne out by observation.

It would also help if they were able to conduct controlled experiments. But to perform a scientific experiment, you have to isolate the experimentee; you have to repeat the experiment over and over; you have to have a control—that is, an identical experimentee on which you do *not* perform the experiment, though you try to keep it under conditions identical in every other way. It is easily seen that an act of political innovation is not an "experiment" in a scientific sense of the term; hence you can never be sure that the ensuing events, happy or otherwise, were in fact caused by the new law or system, or occurred merely in spite of it.

Since the facts of whithering consist mainly of the facts of history, we run into a difficulty right at the start; that there are both too many and too few facts. There are too many to be grasped all at once, like the visible stars. And even so those that have been recorded are only a fraction of the significant things that have happened. Many huge gaps will probably never be filled in.

As an exasperating example of this, take the collected letters of F. M. A. Cassiodorus, who was the chief of the civil service of the Italo-Gothic kingdom in the early 500s. We know hardly anything about price levels in Italy for centuries before and after Cassiodorus' time. Among his letters he preserved an

edict fixing prices in the markets at Ravenna. The letter goes on at length in his usual windy style, full of farfetched classical allusions, before he finally gets around to ordering in plain language that the prices shall henceforth be fixed "in accordance with the subjoined schedule." But he omitted the schedule! As a post-Roman gentleman, it never occurred to him that posterity would be interested in vulgar prices. *He* expected his letters to be appreciated for their grotesquely affected literary style.

THE NEXT difficulty in the science of whithering is furnished by the whitherers themselves. Confronted with an assortment of facts that are at once incomplete, secondhand, and astronomically numerous, it is the easiest thing in the world for the experts on the Cause and Cure of Civilization to read their own prejudices into the gaps in the data. If there are any that do not have prejudices, I have yet to meet their works. Prejudices are particular strong because the whitherers are dealing with matters about which they have strong emotional feelings.

Some of them start out by saying that they are trying to discover the facts, without prejudice. Professor Sorokin, for instance, claims that he admires one type of society as much as another in its creative period. But when we get into the body of his text we find that modern Western culture, which he classifies as "sensate," comes off very badly at his hands. In speaking of what he calls "visual" art—in which class he includes most Western art of the last few centuries—he says that it "—tends to concentrate—on the low, debased, perverse, evil, disgusting, sensual." We may not know much about art, but we have a pretty good idea of what Professor Sorokin likes.

The Italian sociologist Pareto likewise starts out by asserting that he is going to be coldly scientific, without human prejudices, and following a strictly "logico-experimental" method. But the evidence is that he was man of pretty strong dislikes. His "Treatise on General Sociology" is full of derisive remarks which, while they make the work amusing to read, do not support his claim to Olympian impartiality.

And those who do not fall in the foregoing class are mostly out-and-out evangelists for some pet idea, to which the facts must be made to conform, if necessary by the method ascribed in classical myth to the giant Procrustes. One never can be sure, when these thinkers make a statement, whether they really believe it themselves, or whether they are merely saying it in the hope of persuading the rest of us to hang the capitalists, or get religion, or vote for MacSvenson.

But if we examine the conclusions of some of the more prominent of these people about the Cause and Cure of Civilization, it is just possi-

ble that their prejudices will cancel out to some extent, and that we shall be able to find a greatest common denominator of their ideas. Certainly most of us are interested in the future of the human part of our world, and we don't want to overlook anybody who may have a sound idea about it, even if we have to dig it out of a haystack of emotional prepossessions.

In converting a set of facts into a science, the first step is to classify the facts. And here our whitherers break into almost as many schools as there are whitherers.

FIRST there are those who take the nation, or the state—not quite the same thing—as their fundamental unit. Leaders of this school are Georg Hegel (1770-1831) and Heinrich von Treitschke (1834-1896). They argue that the state is, in some mystically unverifiable way, a kind of organism, a superindividual, to which all mere human beings owe obedience. Their dogmatic, *a priori* arguments rear imposing houses of ponderous logic on the sand of sweeping assumptions about the nature of the Universe. Their works contain gems of clarity like this—from Hegel's "Philosophy of History"—"The State is the Idea of Spirit, in the external manifestation of human Will in its Freedom." (You don't understand that, reader? Too bad; neither do I.)

It is all very impressive, but hardly science. The well-recognized sciences have gotten where they have by quite different methods. Hegel, you will remember, was the man who about 1801 told astronomers they were wasting time looking for more planets; if they would study philosophy they would realize that, for philosophical reasons, there had to be seven heavenly bodies—no more, no less. Unfortunately the planetoids Ceres and Pallas were discovered just after Hegel said that, and the discovery of Uranus followed shortly.

In answer to the arguments of these German philosophers about the quasi divinity of the state, we may point out that the modern Nationalistic Sovereign State is a comparatively recent invention, differing in important respects from such organizations as the Feudal State and the Kalifate. Also, to argue by analogy that because a state has some features in common with an organism, it *is* an organism, is about as scientific as arguing that because South America is shaped like a pear it *is* a pear.

But some recent whitherers who take nations as their units do so more empirically; that is, making the theories fit the facts and not vice versa. Silas McKinley—"Democracy and Military Power"—advances an interesting theory of the relation between technical development and form of government. According to him, governments oscillate between democracies, using this overworked term to include all wherein political power is diffused through even a considerable minority of the adult males—as in the Classical Greek township governments—and dictatorships, by which term he means all autocracies whether the autocrat is self-made or hereditary or chosen by some Fascist Grand Council.

McKinley starts out with the reasonable-sounding idea that political power depends ultimately on military power, and that the common man will have just as much power as he is willing and able to fight for. It follows that democracy can exist as a stable form of government only when the fundamental military unit

is a soldier armed with a cheap and simple weapon that is easy to learn to use. Under these circumstances an armed civilian has a fair chance against a professional soldier. But the development of elaborate equipment that few civilians can afford, or complicated technique that only professionals can master, puts the democracies in an unstable state, and sooner or later down they come.

McKinley cites numerous examples: In Classical Greece, democracies replaced monarchies when the equipment of the hoplite, the standard heavy infantryman, became cheap enough for lots of citizens to own. Democracy went out in Greece after 400 B. C., when the generals found they could beat hoplites with peltasts, light infantrymen using a highly developed technique that took years to acquire. Naturally, only the professionals acquired it. Similar results occurred in Rome with the professionalization of the army during the civil wars of 146 to 49 B. C., which followed naturally upon the bringing of infantry technique to the complicated pitch of perfection it had during this period.

After the death of the Roman Republic, the situation was not changed by the replacement of the legionary by the armored cavalryman as the fundamental military unit between 300 and 500 A. D. The invention of stirrups enabled cavalry to charge home against unbroken infantry without all falling off their horses at the moment of impact, like Lewis Carroll's Red and White Knights. Though during the Dark Ages armies returned somewhat to the amateur or citizen-levy basis, the expense of horses and the difficulty of learning to fight on them kept power in the hands of the few.

The revival of democracy followed the development of pike and archery technique in the early Fourteenth Century, at which time Europe broke out in a rash of autonomous, semidemocratic cities. After the defeat of the French cavalry at Poitiers (1365) France just missed becoming a republic. The introduction of gunpowder during the next two centuries reversed this tendency, matchlock muskets being expensive and requiring very skilled operation—an early drill manual prescribed one hundred and three movements for loading and firing one. Naturally there were professional armies and the despotism of Louis XIV.

The replacement of the matchlock by the cheaper and simpler flintlock set the stage for the American and French revolutions and the next wave of the democracy. Today, with the trend toward expensive military machinery such as airplanes, and the importance of professionally trained staffs, the outlook for democratic government is not very bright. When military technics enables one professional soldier to beat a dozen brave amateurs, the civilian is apt to have to do what his self-appointed lords tell him to and like it.

The next group of Cause and Cure experts take economic classes as their units. Most of them are disciples of Karl Marx (1818-1883). According to them, the only division among men that counts is the economic one—into exploiters and exploitees. Between 1500 and 1800 the bourgeoisie threw off the rule of their masters, the feudal lords, and established themselves as a new class of exploiters, the capitalists. The next step will be for the class remaining at the bottom of the economic pyramid, the proletariat or wage earners, to overthrow the capitalists and set up

a dictatorship of the proletariat—which seems to be a euphemism for the leaders of the Marxian party, or whichever of the Marxian parties succeeds in liquidating the others first.

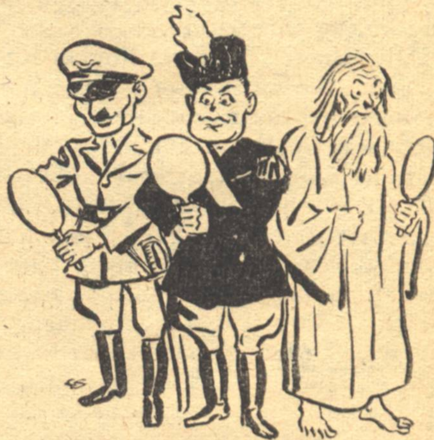
This is inevitable, because the capitalistic system is inherently subject to increasingly severe crises, and because under it the capitalists are bound to become richer and fewer while everybody else becomes poorer and more miserable. The capitalists in their search for foreign markets will force their subject proletarians into imperialist wars, which will sooner or later provide an opportunity for world-wide revolution. Those who refuse to accept the new dispensation will be exterminated.

The proletarian dictatorship will establish socialism, under which all capital goods and land will be owned by "the people"—a euphemism for the government. The young will be so well reared that in a few generations the coercive state organization will "whither away," whereupon we shall have true communism, with all but intimate personal property owned in common, money abolished, everybody working for love of his fellow man, and automobiles given away from the asking. Thus world history according to Marx, Engels, Lenin, and John Strachey, and it is to the advancement of this course of events that the groups who call themselves "Communist"—with a capital C—apply themselves with such demoniac ferocity. Most of those who call themselves "Socialists" combine Marxian economics with democratic, nonviolent political principles. But as they don't go in for such sweeping prophecies, they do not furnish us with reason to discuss them as a separate group of whitherers.

The proletariat—meaning this time the secretary general of the central committee of the Communist Party—has come into power in one country, Russia. The Marxians hold that the world is not big enough for a communist—meaning in this case dictatorial Marxian socialist—and a capitalist government to coexist indefinitely, wherefore they foresee a general war between the U. S. S. R. and the rest of the world. As Toynbee puts it:

> According to the orthodox communist apocalypse, the heathen capitalistic powers are sooner or later to join forces in a supreme effort to take the Soviet Communist Jerusalem by storm and to overwhelm the Communist Chosen People; and on that day, when—on the plains of a Manchurian or Ukrainian Armageddon—the Communist Church Militant is standing at bay against a world of aggressors and is apparently facing hopeless odds, her patron goddess Historical Necessity will manifest her power by putting all the hosts of Midian out of action once and for all at a single miraculous stroke.

IN CRITICISM of the Marxism of the communist variety, it differs greatly from the natural sciences in



Trouble is, even looking in the same mirror, different people tend to see different things—and think them the only things—

that its methods of reasoning are based on Hegel's philosophy and not on the empirical methods that have been so successful in science. Where Marx got the idea that Hegel was a scientist, when this pontifical German schoolmaster seems to have been consistently wrong on scientific questions, I don't know. But he did take Hegel's philosophical, anti-empirical "dialectic" as his tool for dissecting history, except that instead of a mystically exalted state he began with a materially downtrodden working class, whose existence is at least easier to prove. The Marxian "dialectic" provides a plausible explanation of historical events. But so does Zoroastrian theology once you accept its premises —history as the conflict between the divine powers of good and evil.

So the Marxians are not open-minded, scientific seekers after truth. They have already discovered an absolute, final "truth"—just as the lords of the Inquisition had an absolute, final "truth" in their day—though not the same one—to which, in Russia, even the sciences of genetics and astronomy are made to conform. Such success as they have had can be ascribed more to their evangelical zeal than to the scientific soundness of their ideas.

The historical forces allegedly exposed by Marxian analysis are apparently supposed to disappear with the coming of the Marxian Judgment Day, after which there will be no more class conflicts and presumably no history. When a Marxian talks about the "withering away" of the coercive state under the Communist Utopia, it gets you nowhere to remind him that no irresponsible ruling group in history has ever "withered away" of its own sweet will. Ah, he says, but *we* are *different.*

Our next group of whitherers comprises those who take races as their units. They include de Gobineau and H. S. Chamberlain in Europe during the last century, and the late Madison Grant and Lothrop Stoddard in America during this.

Grant's arguments are typical. The white race is divided into the following sub-races: Nordics, tall, slender, blond long-heads, found mainly in northern Europe; Alpines, medium, stocky, dark broad-heads, mainly in central and eastern Europe; Mediterraneans, short, slender, dark long-heads, around the sea whose name they bear. (Some anthropologists add more sub-races, such as an Armenoid race in the Balkans, Turkey, and Iran, and a Hindi race in India.) The blacks and yellows may be similarly subdivided.

According to Grant, the subdivisions of the whites differ not only physically but mentally. Nordics are brave, masterful, and have great scientific and organizing abilities. Mediterraneans are artistically brilliant but temperamentally unstable. Alpines are good-natured and dumb. The world's prospects are gloomy because the Nordics, the "great race," have spread themselves so thinly over the inferior peoples they have conquered that they are mixing with them and disappearing as a distinct race. The mixing will not help the inferiors much, because a cross between members of two races resembles the inferior more than the superior parent. (Grant has his own ideas about laws of heredity, it seems.) The bravery of the Nordics has led them to whittle down their numbers in war. The greatness of Greece and Rome was due to the Nordic element in their populations. Rome declined because the imported Mediterranean and Asiatic slaves swamped the original racial stock.

This, if you don't mind my speaking right out, is the damnedest lot of nonsense that ever masqueraded as science. In the first place, as you travel about Europe, you nowhere find sharp physical distinctions between one set of people and their neighbors; you find continuous gradation from, say, sixty percent blondes to sixty percent brunettes, or from an average stature of five feet ten inches to five feet six inches. It is all very well to speak of the Andaman Island Negritos as a distinct race, because they differ markedly from their nearest neighbors. But that is not true of any European group. And—this is important—there is not the slightest evidence to support the bald assumption that the Nordic, Alpine, and Mediterranean types once existed as distinct, homogenous races, and that the intermediate types, to which most of us belong, are the result of intermixture between these three.

Races *may* differ in temperament and intelligence. But if such differences do exist, we have practically no scientific knowledge of them yet. A beginning has been made, as by Porteus in applying his maze test—designed to eliminate the effects of previous education—to school children in Hawaii. (The Japanese scored highest.)

At any rate, we can discount popular beliefs about racial qualities right at the start. Grant accepts the idea of Nordic military ability, and expands it until the Nordics appear as the most bloodthirsty lot of bandits that ever threw their weight about. But for the last century the Nordic Scandinavians have been peaceful to the point of timorousness. So perhaps the Nordics are not so bad as Grant paints them. Also, it would be hard to find Nordic blood in such military geniuses as the Carthaginian Hannibal—almost certainly a swarthy Mediterranean—the Jew Judas Maccabaeus, the Mongol Jenghiz Khan, the Zulu Tshaka, and so on.

As for the Nordic greatness of ancient Greece and Rome, we simply don't know enough about the physical type of these people to draw racial conclusions. The American anthropologist Linton thinks Greek sculpture shows idealized Armenoid heads. If true, this would imply that the racial make-up of Greece is pretty much the same as it was in Aristotle's time. Aristotle, by the way, had a racial-superiority theory. But the people *he* considered inferior included the noble northern Europeans—barbarians in his time.

ALTOGETHER the whitherers to whom the Cause and Cure of Civilization is a matter of states or economic classes or races don't seem able to help us much. So let us turn to those who take societies—cultures or civilizations—as their units. Among them, as among the others, we find that the experts' conclusions color their outlook. They may be classified as materialists and mystics, and again as optimists and pessimists. If A considers religious feeling as necessary for a society to be considered civilized, and believes that the world is becoming more and more materialistic and scientific, he will look on the present state of affairs as one of decline and degeneration. If B thinks the same about the world's trends as A, but regards technical development and a materialistic outlook as synonymous with civilization, he will naturally be a cheery optimist about it all, since "it all" is going in just the direction he considers proper.

An example of an optimistic mystic is Professor Pitrim A. Sorokin

of Harvard University—"Social and Cultural Dynamics"—whom we have met before. He classifies cultures as "Ideational," "Idealistic," or "Sensate," according to the prevailing mental types of the dominant personalities thereof. An "Ideational" mind holds that there is an Absolute Truth outside the testimony of the senses. The world of the senses is an illusion; the real world is something eternal and extrasensory, to be discovered by introspection and inspiration and believed in by faith. An Ideational culture will be static, religious with a tendency toward priestly government, and will have little progress in science and invention.

A "Sensate" mind is just the opposite: it believes what it sees, has a materialistic outlook, empirical philosophy, and ethics of pleasure. Sensate culture is characterized by secular government—usually corrupt—active science and invention, and rapidly changing social life. Societies swing from one type to the other. In passing from Ideational to Sensate culture, they go through an intermediate phase, the "Idealistic," when, according to this earnest whitherer, the culture reaches a "marvelous balance" and people are as happy as they are likely to be on Earth. Then Ideational becomes Sensate. Sensate culture carries the seeds of its own destruction; the selfishness and low cunning that it releases in its dominant personalities ruin it, and the ground is prepared for the rise of a new Sensate culture.

Classical culture was Idealistic in the time of Socrates and Plato (428-348 B. C.). It thereafter became more and more Sensate, swinging back to Ideational around the end of the West Roman Empire. The early Middle Ages were Ideational. St. Thomas Aquinas (1225-1274) represents the Idealistic transition. Sorokin, like many nonscientific scholars, looks back to the Thirteenth Century as a kind of Golden Age. This marvelous period was succeeded by one of Sensate culture, which reached its climax in the last few centuries and is now on the decline. We can expect another spell of Ideationalism. Other societies show a similar cyclic history, except that India has always been Ideational.

The view that civilization moves in cycles is old. Aristotle had a cyclic theory; so did the great Arab historian Ibn Khaldun (1332-1406). This extraordinary man once talked himself out of the clutches of the Tatar conqueror Timur by offering to recite the chapter of his "Universal History" dealing with Timur's career to date, with the request that Timur, whose architectural specialty was pyramids of human heads, should correct any inaccuracies in the text!

There is also the traditional Judaeo-Christian view of history as a theological drama, whose curtain will be the Last Judgment. And there is the linear view; the story of a continuous decline from a primitive Golden Age—now pretty well exploded—or that of a continuous improvement from savagery to Utopia. Marxism is linear in this sense.

To GET BACK to Sorokin: He has tried, in the true Sensate tradition, to trace movements in human affairs by statistics going back over two millennia. For instance, he traces fluctuations in types of painting during the last thousand years, according to subjects and according to the proportion of Sensate and Ideational paintings at a given time. The dozens of tables and graphs imply

that painting has followed the general trend of Western culture. Today Sensate art is going into dissolution in a chaos of psychopathic fantasy—such as Dali's famous limp watches—and the thing to expect is a new wave of Ideational art.

He applies this method over an enormous field: architecture, music, literature, science, philosophy, religion, law, et cetera. Conveniently, in all cases it heralds the "dawn of a new great Ideational culture." Now, I am not competent to pass on most of his tables and graphs. But when he alleges that inventive activity has declined in the last few decades, I want to enter a demurrer, as I once made my living in that field.

His tables show a decreasing number of patents issued yearly in the U. S. A., and a decline in the rate of production of basic inventions. *But* they have not apparently been corrected for several important factors. One: the number of patents issued depends not merely on inventive activity, but on the strictness with which the Patent Office is interpreting the patent laws. Two: we cannot say whether an invention is basic until a few decades after it appears, and there has been time for it to give rise to a whole new art. Three: in any art, the proportion of basic to improvement inventions is bound to decline, regardless of inventive activity, for the simple reason that an invention can be made for the first time only *once*. Naturally no bright inventor is going to reinvent the telephone every decade; if he does he won't get far.

A scientist who is well up on mathematics and chemistry exploded when he saw Sorokin's graphs on advances in these fields, showing a decline since 1880. A military expert likewise objected to the figures for sizes of armies and number of war casualties in Europe per century since 1100 A. D. Sorokin admits that his figures are inconclusive, since there is no accurate information on such things for the earlier centuries. And he has gone to great trouble to check his estimates from all possible sources. But the suspicion remains that he has filled the gaps in the data with his own prepossessions, as shown by such sentences as: "—we are indeed living in the most scientific—and therefore most unreal world."

The medievalist bias involves him in some curious contradictions: He asserts that the doubts of modern scientists about the validity of their theories, and their readiness to discard them, show that they are losing faith in their science. But this contradicts his statements that scientific discovery is on the wane: a perfectly stable science is a *dead* science, like descriptive geometry today.

He cites Babylonian numerology, reasonably enough, as an example of the Ideational concept of number. But he goes on, speaking of modern mathematics, to say: "—belief in the efficacy of mathematical formula, and the sense of the mathematical irrational numbers, like the square root of minus one ($\sqrt{-1}$), contain elements of Ideational conception of number." If imaginary numbers—which he miscalls "irrational"—and Babylonian numerology are the same sort of thing, I'd just love to see somebody design some alternating current machinery using Babylonian numerology for his calculations.

So far we seem to be mining pretty low-grade ore, as far as real scientific whithering goes. But don't give up yet; there are plenty of whitherers left, and perhaps next month we'll hit some richer veins in our survey.

TO BE CONCLUDED

DARK MISSION

By Lester del Rey

Illustrated by Orban

He came on a mission—came from very far, on a horribly important mission, he knew. But he'd forgotten whence and why—

THE rays of the Sun lanced down over the tops of the trees and into the clearing, revealing a scene of chaos and havoc. Yesterday there had been a wooden frame house there, but now only pieces of it remained. One wall had been broken away, as by an explosion, and lay on the ground in fragments; the roof was crushed in, as if some giant had stepped on it and passed on.

But the cause of the damage was still there, lying on the ruins of the house. A tangled mass of buckled

girders and metal plates lay mixed with a litter of laboratory equipment that had been neatly arranged in one room of the house, and parts of a strange engine lay at one side. Beyond was a tube that might have been a rocket. The great metal object that lay across the broken roof now only hinted at the sleek cylinder it had once been, but a trained observer might have guessed that it was the wreck of a rocketship. From the former laboratory, flames were licking up at the metal hull, and slowly spreading toward the rest of the house.

In the clearing, two figures lay outstretched, of similar size and build, but otherwise unlike. One was of a dark man of middle age, completely naked, with a face cut and battered beyond all recognition. The odd angle of the head was unmistakable proof that his neck was broken. The other man might have been a brawny sea viking of earlier days, both from his size and appearance, but his face revealed something finer and of a higher culture. He was fully clothed, and the slow movement of his chest showed that there was still life in him. Beside him, there was a broken beam from the roof, a few spots of blood on it. There was more blood on the man's head, but the cut was minor, and he was only stunned.

Now he stirred uneasily and groped uncertainly to his feet, shaking his head and fingering the cut on his scalp. His eyes traveled slowly across the clearing and to the ruins that were burning merrily. The corpse claimed his next attention, and he turned it over to examine the neck. He knit his brows and shook his head savagely, trying to call back the memories that eluded him.

They would not come. He recognized what his eyes saw, but his mind produced no words to describe them, and the past was missing. His first memory was of wakening to find his head pounding with an ache that was almost unbearable. Without surprise, he studied the rocket and saw that it had come down on the house, out of control, but it evoked no pictures in his mind, and he gave up. He might have been in the rocket or the house at the time; he had no way of telling which. Probably the naked man had been asleep at the time in the house.

Something prickled gently in the back of his mind, growing stronger and urging him to do something. He must not waste time here, but must fulfill some vital mission. What mission? For a second, he almost had it, and then it was gone again, leaving only the compelling urge that must be obeyed. He shrugged and started away from the ruins toward the little trail that showed through the trees.

Then another impulse called him back to the corpse, and he obeyed it because he knew of nothing else to do. Acting without conscious volition, he tugged at the corpse, found it strangely heavy, and dragged it toward the house. The flames were everywhere now, but he found a place where the heat was not too great and pulled the corpse over a pile of combustibles.

With the secondary impulse satisfied, the first urge returned, and he set off down the trail, moving slowly. The shoes hurt his feet, and his legs were leaden, but he kept on grimly, while a series of questions went around his head in circles. Who was he, where, and why?

Whoever had lived in the house, himself or the corpse, had obviously chosen the spot for privacy; the trail seemed to go on through the woods.

endlessly, and he saw no signs of houses along it. He clumped on mechanically, wondering if there was no end, until a row of crossed poles bearing wires caught his eye. Ahead, he made out a broad highway, with vehicles speeding along it in both directions, and hastened forward, hoping to meet someone.

LUCK was with him. Pulled up at the side of the road was one of the vehicles, and a man was doing something at the front end of the car. Rough words carried back to him suggesting anger. He grinned suddenly and hastened toward the car, his eyes riveted on the man's head. A tense feeling shot through his brain and left, just as he reached the machine.

"Need help?" The words slipped out unconsciously, and now other words came pouring into his head, along with ideas and knowledge that had not been there before. But the sight of the man, or whatever had restored that section of his memory, had brought back no personal knowledge, and that seemed wrong somehow. The driving impulse he felt was still unexplained.

The man had looked up at his words, and relief shot over the sweating face. "Help's the one thing I need," he replied gratefully. "I been fussing with this blasted contraption darned near an hour, and nobody's even stopped to ask, so far. Know anything about it?"

"Um-m-m." The stranger, as he was calling himself for want of a better name, tested the wires himself, vaguely troubled at the simplicity of the engine. He gave up and went around to the other side, lifting the hood and inspecting the design. Then sureness came to him as he reached for the tool kit. "Probably the . . . um . . . timing pins," he said.

It was. A few minutes later the engine purred softly and the driver turned to the stranger. "O. K. now, I guess. Good thing you came along; worst part of the road, and not a repair shop for miles. Where you going?

"I—" The stranger caught himself. "The big city," he said, for want of a better destination.

"Hop in, then. I'm going to Elizabeth, right on your way. Glad to have you along; gets so a man talks to himself on these long drives, unless he has something to do. Smoke?"

"Thank you, no. I never do." He watched the other light up, feeling uncomfortable about it. The smell of the smoke, when it reached him, was nauseous, as were the odor of gasoline and the man's own personal effluvium, but he pushed them out of his mind as much as possible. "Have you heard or read anything about a rocketship of some kind?"

"Sure. Oglethorpe's, you mean? I been reading what the papers had to say about it." The drummer took his eyes off the road for a second, and his beady little eyes gleamed. "I been wondering a long time why some of these big-shot financiers don't back up the rockets, and finally Oglethorpe does. Boy, now maybe we'll find out something about this Mars business."

The stranger grinned mechanically. "What does his ship look like?"

"Picture of it in the *Scoop,* front page. Find it back of the seat, there. Yeah, that's it. Wonder what the Martians look like?"

"Hard to guess," the stranger answered. Even rough halftones of the picture showed that it was not the ship that had crashed, but radically different. "No word of other rockets?"

"Nope, not that I know of.

You know, I kinda feel maybe the Martians might look like us. Sure." He took the other's skepticism for granted without looking around. "Wrote a story about that once, for one of these science-fiction magazines, but they sent it back. I figured out maybe a long time ago there was a civilization on Earth—Atlantis, maybe—and they went over and settled on Mars. Only Atlantis sunk on them, and there they were, stranded. I figured maybe one day they came back, sort of lost out for a while, but popped up again and started civilization humming. Not bad, eh?"

"Clever," the stranger admitted. "But it sounds vaguely familiar. Suppose we said instead there was a war between the mother world and Mars that wrecked both civilizations, instead of your Atlantis sinking. Wouldn't that be more logical?"

"Maybe, I dunno. Might try it, though mostly they seem to want freaks— Darned fool, passing on a hill!" He leaned out to shake a pudgy fist, then came back to his rambling account. "Read one the other day with two races, one like octopuses, the others twenty feet tall and all blue."

Memory pricked tantalizingly and came almost to the surface. Blue— Then it was gone again, leaving only a troubled feeling. The stranger frowned and settled down in the seat, answering in monosyllables to the other's monologue, and watching the patchwork of country and cities slip by.

"There's Elizabeth. Any particular place you want me to drop you?"

The stranger stirred from the half-coma induced by the cutting ache in his head, and looked about. "Any place," he answered. Then the urge in the back of his mind grabbed at him again, and he changed it. "Some doctor's office."

That made sense, of course. Perhaps the impulse had been only the logical desire to seek medical aid, all along. But it was still there, clamoring for expression, and he doubted the logic of anything connected with it. The call for aid could not explain the sense of disaster that accompanied it. As the car stopped before a house with a doctor's shingle, his pulse was hammering with frenzied urgency.

"Here we are." The drummer reached out toward the door handle, almost brushing one of the other's hands. The stranger jerked it back savagely, avoiding contact by a narrow margin, and a cold chill ran up his back and quivered its way down again. If that hand had touched him— The half-opened door closed again, but left one fact impressed on him. Under no conditions must he suffer another to make direct contact with his body, lest something horrible should happen! Another crazy angle, unconnected with the others, but too strong for disobedience.

He climbed out, muttering his thanks, and made up the walk toward the office of Dr. Lanahan, hours 12:00 to 4:00.

The doctor was an old man, with the seamed and rugged good-nature of the general practitioner, and his office fitted him. There was a row of medical books along one wall, a glass-doored cabinet containing various medicaments, and a clutter of medical instruments. He listened to the stranger's account quietly, smiling encouragement at times, and tapping the desk with his pencil.

"Amnesia, of course," he agreed, finally. "Rather peculiar in some

respects, but most cases of that are individual. When the brain is injured, its actions are usually unpredictable. Have you considered the possibility of hallucinations in connection with those impulses you mention?"

"Yes." He had considered it from all angles, and rejected the solutions as too feeble. "If they were ordinary impulses, I'd agree with you. But they're far deeper than that, and there's a good reason for them, somewhere. I'm sure of that."

"Hm-m-m." The doctor tapped his pencil again and considered. The stranger sat staring at the base of his neck, and the tense feeling in his head returned, as it had been when he first met the drummer. Something roiled around in his mind and quieted. "And you have nothing on you in the way of identification?"

"Uh!" The stranger grunted, feeling foolish, and reached into his pockets. "I hadn't thought of that." He brought out a package of cigarettes, a stained handkerchief, glasses, odds and ends that meant nothing to him, and finally a wallet stuffed with bills. The doctor seized on that and ran through its contents quickly.

"Evidently you had money. . . . Hm-m-m, no identification card, except for the letters L. H. Ah, here we are; a calling card." He passed it over, along with the wallet, and smiled in self-satisfaction. "Evidently you're a fellow physician, Dr. Lurton Haines. Does that recall anything?"

"Nothing." It was good to have a name, in a way, but that was his only response to the sight of the card. And why was he carrying glasses and cigarettes for which he had no earthly use?

The doctor was hunting through his pile of books, and finally came up with a dirty red volume. "Who's Who," he explained. "Let's see. Hm-m-m! Here we are. 'Lurton R. Haines, M. D.' Odd, I thought you were younger than that. Work along cancer research. No relatives mentioned. The address is evidently that of the house you remember first —'Surrey Road, Danesville.' Want to see it?"

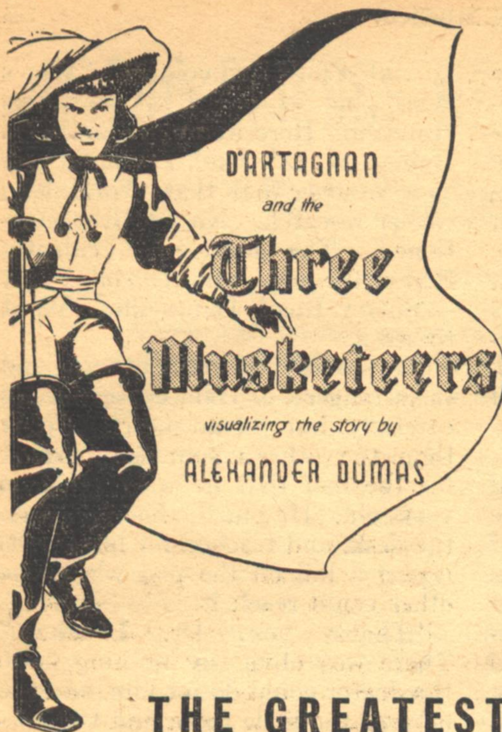
He passed the volume over, and the stranger—or Haines—scanned it carefully, but got no more out of it than the other's summary, except for the fact that he was forty-two years old. He put the book back on the desk, and reached for his wallet, laying a bill on the pad where the other could reach it.

"Thank you, Dr. Lanahan." There was obviously nothing more the doctor could do for him, and the odor of the little room and the doctor were stifling him; apparently he was allergic to the smell of other men. "Never mind the cut on the head—it's purely superficial."

"But—"

Haines shrugged and mustered a smile, reached for the door, and made for the outside again. The urge was gone now, replaced by a vast sense of gloom, and he knew that his mission had ended in failure.

THEY knew so little about healing, though they tried so hard. The entire field of medicine ran through Haines' mind now, with all its startling successes and hopeless failures, and he knew that even his own problem was beyond their ability. And the knowledge, like the sudden return of speech, was a mystery; it had come rushing into his mind while he stared at the doctor, at the end of the sudden tenseness, and a numbing sense of failure had accompanied it. Strangely, it was not the knowledge of a specialist in cancer research, but



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such common methods as a general practitioner might use.

One solution suggested itself, but it was too fantastic for belief. The existence of telepaths was suspected, but not ones who could steal whole pages of knowledge from the mind of another, merely by looking at him. No, that was more illogical than the sudden wakening of isolated fields of memory by the sight of the two men.

He stopped at a corner, weary under the load of despondency he was carrying, and mulled it over dully. A newsboy approached hopefully. "*Time* a' *News* out!" the boy singsonged his wares. "*Scoop* 'n' *Juhnal!* Read awl about the big train wreck! Paper, mister?"

Haines shrugged dully. "No paper!"

"Blonde found muidehed in bathtub," the boy insinuated. "Mahs rocket account!" The man must have an Achilles' heel somewhere.

But the garbled jargon only half registered on Haines' ears. He started across the street, rubbing his temples, before the second driving impulse caught at him and sent him back remorselessly to the paper boy. He found some small change in his pocket, dropped a nickel on the pile of papers, disregarding the boy's hand, and picked up a copy of the *Scoop*. "Screwball," the boy decided aloud, and dived for the nickel.

The picture was no longer on the front page of the tabloid, but Haines located the account with some effort. "Mars Rocket Take-off Wednesday," said the headline in conservative twenty-four-point type, and there was three-quarters of a column under it. "Man's first flight to Mars will not be delayed, James Oglethorpe told reporters here today. Undismayed by the skepticism of the scientists, the financier is going ahead with his plans, and expects his men to take off for Mars Wednes-

day, June 8, as scheduled. Construction has been completed, and the rocket machine is now undergoing tests."

Haines scanned down the page, noting the salient facts. The writer had kept his tongue in his cheek, but under the faintly mocking words there was the information he wanted. The rocket might work; man was at last on his way toward the conquests of the planets. There was no mention of another rocket. Obviously then, that one must have been built in secret in a futile effort to beat Oglethorpe's model.

But that was unimportant. The important thing was that he must stop the flight! Above all else, man must not make that trip! There was no sanity to it, and yet somehow it was beyond mere sanity. It was his duty to prevent any such voyage, and that duty was not to be questioned.

He returned quickly to the newsboy, reached out to touch his shoulder, and felt his hand jerk back to avoid the touch. The boy seemed to sense it, though, for he turned quickly. "Paper?" he began brightly before recognizing the stranger. "Oh, it's you. Watcha want?"

"Where can I find a train to New York?" Haines pulled a quarter from his pocket and tossed it on the pile of papers.

The boy's eyes brightened again. "Four blocks down, turn right, and keep going till you come to the station. Can't miss it. Thanks, mister."

The discovery of the telephone book as a source of information was Haines' single major triumph, and the fact that the first Oglethorpe he tried was a colored street cleaner failed to take the edge off it. Now he trudged uptown, counting the numbers that made no sense to him; apparently the only system was one of arithmetical progression, irrespective of streets.

His shoulders were drooping, and the lines of pain around his eyes had finally succeeded in drawing his brows together. A coughing spell hit him, torturing his lungs for long minutes, and then passed. That was a new development, as was the pressure around his heart. And everywhere was the irritating aroma of men, gasoline, and tobacco, a stale mixture that he could not escape. He thrust his hands deeper into his pockets to avoid chance contact with someone on the street, and crossed over toward the building that bore the number for which he was searching.

Another man was entering the elevator, and he followed mechanically, relieved that he would not have to plod up the stairs. "Oglethorpe?" he asked the operator, uncertainly.

"Fourth floor, Room 405." The boy slid the gate open, pointing, and Haines stepped out and into the chromium-trimmed reception room. There were half a dozen doors leading from it, but he spotted the one marked "James H. Oglethorpe, Private," and slouched forward.

"Were you expected, sir?" The girl popped up in his face, one hand on the gate that barred his way. Her face was a study in frustration, which probably explained the sharpness of her tone. She delivered an Horatius-guarding-the-bridge formula. "Mr. Oglethorpe is busy now."

"Lunch," Haines answered curtly. He had already noticed that men talked more freely over food.

She flipped a little book in her hand and stared at it. "There's no record here of a luncheon engagement, Mr.—"

"Haines. Dr. Lurton Haines." He grinned wryly, wiggling a twenty-dollar bill casually in one hand. Money was apparently the one disease to which nobody was immune. Her eyes dropped to it, and hesitation entered her voice as she consulted her book.

"Of course, Mr. Oglethorpe might have made it some time ago and forgotten to tell me—" She caught his slight nod, and followed the bill to the corner of the desk. "Just have a seat, and I'll speak to Mr. Oglethorpe."

She came out of the office a few minutes later, and winked quickly. "He'd forgotten," she told Haines, "but it's all right now. He'll be right out, Dr. Haines. It's lucky he's having lunch late today."

James Oglethorpe was a younger man than Haines had expected, though his interest in rocketry might have been some clue to that. He came out of his office, pushing a Homburg down on curly black hair, and raked the other with his eyes. "Dr. Haines?" he asked, thrusting out a large hand. "Seems we have a luncheon engagement."

Haines rose quickly and bowed before the other had a chance to grasp his hand. Apparently Oglethorpe did not notice, for he went on smoothly. "Easy to forget these telephone engagements, sometimes. Aren't you the cancer man? One of your friends was in a few months ago for a contribution to your work."

They were in the elevator then, and Haines waited until it opened and they headed for the lunchroom in the building before answering. "I'm not looking for money this time, however. It's the rocket you're financing that interests me. I think it may work."

"It will, though you're one of the few that believes it." Caution, doubt, and interest were mingled on Oglethorpe's face. He ordered before turning back to Haines. "Want to go along? If you do, there's still room for a physician in the crew."

"No, nothing like that. Toast and milk only, please—" Haines had no idea of how to broach the subject, with nothing concrete to back up his statements. Looking at the set of the other's jaw and the general bulldog attitude of the man, he gave up hope and only continued because he had to. He fell back on imagination, wondering how much of it was true.

"Another rocket made that trip, Mr. Oglethorpe, and returned. But the pilot was dying before he landed. I can show you the wreck of his machine, though there's not much left after the fire—perhaps not enough to prove it was a rocketship. Somewhere out on Mars there's something man should never find. It's—"

"Ghosts?" suggested Oglethorpe, brusquely.

"Death! I'm asking you—"

Again Oglethorpe interrupted. "Don't. There was a man in to see me yesterday who claimed he'd been there—offered to show me the wreck of *his* machine. A letter this morning explained that the Martians had visited the writer and threatened all manner of things. I'm not calling you a liar, Dr. Haines, but I've heard too many of those stories; whoever told you this one was either a crank or a horror-monger. I can show you a stack of letters that range from astrology to zombies, all explaining why I can't go, and some offer photographs for proof."

"Suppose I said I'd made the trip in that rocket?" The card in the wallet said he was Haines, and the wallet had been in the suit he was wear-

ing; but there had also been the glasses and cigarettes for which he had no use.

Oglethorpe twisted his lips, either in disgust or amusement. "You're an intelligent man, Dr. Haines; let's assume I am, also. It may sound ridiculous to you, but the only reason I had for making the fortune I'm credited with was to build that ship, and it's taken more work and time than the layman would believe. If a green ant, seven feet high, walked into my office and threatened Armageddon, I'd still go."

Even the impossible impulse recognized the impossible. Oglethorpe was a man who did things first and worried about them when the mood hit him—and there was nothing moody about him. The conversation turned to everyday matters and Haines let it drift as it would, finally dragging out into silence.

At least, he was wiser by one thing: he knew the location of the rocket ground and the set-up of guards around it—something even the newspapermen had failed to learn, since all pictures and information had come through Oglethorpe. There could no longer be any question of his ability to gain desired information by some hazy telepathic process. Either he was a mental freak, or the accident had done things to him that should have been surprising but weren't.

Haines had taken a cab from the airport, giving instructions that caused the driver to lift his eyebrows; but money was still all-powerful. Now they were slipping through country even more desolate than the woods around Haines' house, and the end of the road came into view, with a rutted muddy trail leading off, marked by the tires of the trucks Oglethorpe had used for his freighting. The cab stopped there.

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"This the place?" the driver asked uncertainly.

"It is." Haines added a bill to what had already been paid and dismissed him. Then he dragged his way out to the dirt road and followed it, stopping for rest frequently. His ears were humming loudly now, and each separate little vertebra of his back protested at his going on. But there was no turning back; he had tried that, at the airport and found the urge strong enough to combat his weakening will.

"Only a little rest!" he muttered thickly, but the force in his head lifted his leaden feet and sent them marching toward the rocket camp. Above him the gray clouds passed over the Moon, and he looked up at Mars shining in the sky. Words from the lower part of the drummer's vocabulary came into his throat, but the effort of saying them was more than the red planet merited. He plowed on in silence.

Mars had moved over several degrees in the sky when he first sighted the camp, lying in a long, narrow valley. At one end were the shacks of the workmen, at the other a big structure that housed the rocket from chance prying eyes. Haines stopped to cough out part of his lungs, and his breath was husky and labored as he worked his way down.

The guards should be strung out along the edge of the valley. Oglethorpe was taking no chances with the cranks who had written him letters and denounced him as a godless fool leading his men to death. Rockets at best were fragile things, and only a few men would be needed to ruin the machine once it was discovered. Haines ran over the guards' positions, and skirted through the underbrush, watching for periods when the Moon was darkened. Once he almost tripped an alarm, but missed it in time.

Beyond, there was no shrubbery, but his suit was almost the shade of the ground in the moonlight, and by lying still between dark spells, he crawled forward toward the rocket shed, undetected. He noticed the distance of the houses and the outlying guards and nodded to himself; they should be safe from any explosion.

The coast looked clear. Then, in the shadow of the building, a tiny red spark gleamed and subsided slowly; a man was there, smoking a cigarette. By straining his eyes, Haines made out the long barrel of a rifle against the building. This guard must be an added precaution, unknown to Oglethorpe.

A SUDDEN rift in the thickening clouds came, and Haines slid himself flat against the ground, puzzling over the new complication. For a second he considered turning back, but realized that he could not—his path now was clearly defined, and he had no choice but to follow it. As the Moon slid out of sight again, he came to his feet quietly and moved toward the figure waiting there.

"Hello!" His voice was soft, designed to reach the man at the building but not the guards behind in the outskirts. "Hello, there. Can I come forward? Special inspector from Oglethorpe."

A beam of light lanced out from the shadow, blinding him, and he walked forward at the best pace he could muster. The light might reveal him to the other guards, but he doubted it; their attention was directed outward, away from the buildings.

"Come ahead," the answer came finally. "How'd you get past the others?" The voice was suspicious, but not unusually so. The rifle,

Haines saw, was directed at his midsection, and he stopped a few feet away, where the other could watch him.

"Jimmy Durham knew I was coming," he told the guard. According to the information he had stolen from Oglethorpe's mind, Durham was in charge of the guards. "He told me he hadn't had time to notify you, but I took a chance."

"Hm-m-m. Guess it's all right, since they let you through; but you can't leave here until somebody identifies you. Keep your hands up." The guard came forward cautiously to feel for concealed weapons. Haines held his hands up out of the other's reach, where there was no danger of a direct skin to skin contact. "O. K., seems all right. What's your business here?"

"General inspection; the boss got word there might be a little trouble brewing and sent me here to make sure guard was being kept, and to warn you. All locked up here?"

"Nope. A lock wouldn't do much good on this shack; that's why I'm here. Want I should signal Jimmy to come and identify you so you can go?"

"Don't bother." Conditions were apparently ideal, except for one thing. But he would not murder the guard! There must be some other way, without adding that to the work he was forced to do. "I'm in no hurry, now that I've seen everything. Have a smoke?"

"Just threw one away. 'Smatter, no matches? Here."

Haines rubbed one against the friction surface of the box and lit the cigarette gingerly. The raw smoke stung against his burning throat, but he controlled the cough, and blew it out again; in the dark, the guard could not see his eyes watering, nor the grimaces he made. He was waging a bitter fight with himself against the impulse that had ordered the smoke to distract the guard's attention, and he knew he was failing. "Thanks!"

One of the guard's hands met his, reaching for the box. The next second the man's throat was between the stranger's hands, and he was staggering back, struggling to tear away and cry for help. Surprise confused his efforts for the split second necessary, and one of Haines' hands came free and out, then chopped down sharply to strike the guard's neck with the edge of the palm. A low grunt gurgled out, and the figure went limp.

Impulse had conquered again! The guard was dead, his neck broken by the sharp blow. Haines leaned against the building, catching his breath and fighting back the desire to lose his stomach's contents. When some control came back, he picked up the guard's flashlight, and turned into the building. In the darkness, the outlines of the great rocketship were barely visible.

WITH fumbling fingers Haines groped forward to the hull, then struck a match and shaded it in his hands until he could make out the airport, standing open. Too much light might show through a window and attract attention.

Inside, he threw the low power of the flashlight on and moved forward, down the catwalk and toward the rear where the power machinery would be housed. It had been simple, after all, and only the quick work of destruction still remained.

He traced the control valves easily, running an eye over the uncovered walls and searching out the pipes that led from them. From the little apparatus he saw, this ship was obviously inferior to the one

that had crashed, yet it had taken years to build and drained Oglethorpe's money almost to the limit. Once destroyed, it might take men ten more years to replace it; two was the minimum, and in those two years—

The thought slipped from him, but some memories were coming back. He saw himself in a small metal room, fighting against the inexorable exhaustion of fuel, and losing. Then there had been a final burst from the rockets, and the ship had dropped sickeningly through the atmosphere. He had barely had time to get to the air locks before the crash. Miraculously, as the ship's fall was cushioned by the house, he had been thrown free into the lower branches of a tree, to catch, and lose momentum before striking Earth.

The man who had been in the house had fared worse; he had been thrown out with the wrecked wall, already dead. Roughly, the stranger remembered a hasty transfer of clothing from the corpse, and then the beam had dropped on him, shutting out his memory in blackness. So he was not Haines, after all, but someone from the rocket, and his story to Oglethorpe had been basically true.

Haines—he still thought of himself under that name—caught himself as his knees gave under him, and hauled himself up by the aid of a protruding bar. There was work to be done; after that, what happened to his own failing body was another matter. It seemed now that from his awakening he had expected to meet death before another day, and had been careless of the fact.

He ran his eyes around the rocket room again, until he came to a tool kit that lay invitingly open with a large wrench sticking up from it. That would serve to open the valves. The flashlight lay on the floor where he had dropped it, and he kicked it around with his foot to point at the wall, groping out for the wrench. His fingers were stiff as they clasped around the handle.

And, in the beam of light, he noticed his hand for the first time in hours. Dark-blue veins rose high on flesh that was marked with a faint pale-blue. He considered it dully, thrusting out his other hand and examining it; there, too, was the blue flush, and on his palms, as he turned them upward, the same color showed. Blue!

The last of his memory flashed through his brain in a roaring wave, bringing a slow tide of pictures with it. With one part of his mind, he was working on the valves with the wrench, while the other considered the knowledge that had returned to him. He saw the streets of a delicate, fairy city, half deserted, and as he seemed to watch, a man staggered out of a doorway, clutching at his throat with blue hands, to fall writhing to the ground! The people passed on quickly, avoiding contact with the corpse, fearful even to touch each other.

Everywhere, death reached out for the people. The planet was riddled with it. It lay on the skin of an infected person, to be picked up by the touch of another, and passed on to still more. In the air, a few seconds sufficed to kill the germs, but new ones were being sent out from the pores of the skin, so that there were always a few active ones lurking there. On contact, the disease began an insidious conquest, until, after months without a sign, it suddenly attacked the body housing it, turned it blue, and brought

death in a few painful hours.

Some claimed it was the result of an experiment that had gone beyond control, others that it had dropped as a spore from space. Whatever it was, there was no cure for it on Mars. Only the legends that spoke of a race of their people on the mother world of Earth offered any faint hope, and to that they had turned when there was no other chance.

He saw himself undergoing examinations that finally resulted in his being chosen to go in the rocket they were building feverishly. He had been picked because his powers of telepathy were unusual, even to the mental science of Mars; the few remaining weeks had been used in developing that power systematically, and implanting in his head the duties that he must perform, so long as a vestige of life remained to him.

Haines watched the first of the liquid from the fuel pipes splash out, and dropped the wrench. Old Leán Dagh had doubted his ability to draw knowledge by telepathy from a race of a different culture, he reflected; too bad the old man had died without knowing of the success his methods had met, even though the mission had been a failure, due to man's feeble knowledge of the curative sciences. Now his one task was to prevent the race of this world from dying in the same manner.

He pulled himself to his feet again and went staggering down the catwalk, muttering disconnected sentences. The blue of his skin was darker now, and he had to force himself across the space from the ship to the door of the building, grimly commanding his failing muscles, to the guard's body that still lay where he had left it.

Most of the strength left him was useless against the pull of this heavier planet and the torture movement had become. He tried to drag the corpse behind him, then fell on hands and knees and backed toward the ship, using one arm and his teeth on the collar to pull it after him. He was swimming in a world that was bordering on unconsciousness, now, and once darkness claimed him; he came out of it to find himself inside the rocket, still dragging his burden, the implanted impulses stronger than his will.

Bit by bit, he dragged his burden behind him down the catwalk, until the engine room was reached, and he could drop it on the floor, where the liquid fuel had made a thin film. The air was heavy with vapors, and chilled by the evaporation, but he was only partly conscious of that. Only a spark was needed now, and his last duty would be finished.

Inevitably, a few of the dead on Mars would be left unburned, where men might find the last of that unfortunate race, and the germs would still live within them. Earthmen must not face that. Until such a time as the last Martian had crumbled to dust and released the plague into the air to be destroyed, the race of Earth must remain within the confines of its own atmosphere, and safe.

There was only himself and the corpse he had touched left here to carry possible germs, and the ship to carry the men to other sources of infection; all that was easily remedied.

The stranger from Mars groped in his pocket for the guard's matchbox, smiling faintly. Just before the final darkness swept over him, he drew one of the matches from the box and scraped it across the friction surface. Flame danced from the point and outward—

THE RED DEATH OF MARS

By Robert Moore Williams

Illustrated by Schneeman

Crystalline jewels scattered about deserted cities, and spaceships that landed on Mars and—became silent. A mystery that no man, somehow, lived to explain, even by radio—

SPARKS AVERY, on vigil beside his radio equipment, saw the three men coming. He didn't need to look twice to know that something was wrong. Rising, he opened the controls that manipulated the outer door of the lock.

From the stern of the ship came a rattle of pots and pans as Shorty Adams, the dour cook, prepared the evening meal.

Angus McIlrath, far-wandering son of Scotland, came forward from his engine room. Momentarily, as he opened the door, the muted hiss of the uranium fission engines sounded.

"What is it, lad?" McIlrath asked.

Sparks pointed to the three men. They were nearer now. Coming across the sandy square, the dust splashed around their feet and hung in an eddying cloud behind them, dust that had never known rain.

McIlrath squinted through the double glass of the port, shielding his old eyes against the thin sun glare of Mars. "I don't like their faces, lad."

Sparks did not answer. Heavy boots clumped in the lock. The outer door clanged. Air hissed softly. The inner door opened.

Martin Frome, tall and thin, came first. His blue-gray eyes rested for an instant on the radio man. He said nothing. Behind him came James Sutter, swinging his long arms like a waddling ape. And last came Vincent Orsatti, blinking weak eyes behind thick-lensed spectacles.

"Is everything all right in the ship?" Frome asked.

"Right, sir," Sparks answered.

"You kept close watch from the ports, as I directed?"

"Yes."

"You observed nothing unusual, no movement of any kind?"

"Nothing."

Frome turned to McIlrath. "Are the engines ready?"

"The engines," said McIlrath evenly, "are always ready."

"Keep them that way," said Frome flatly.

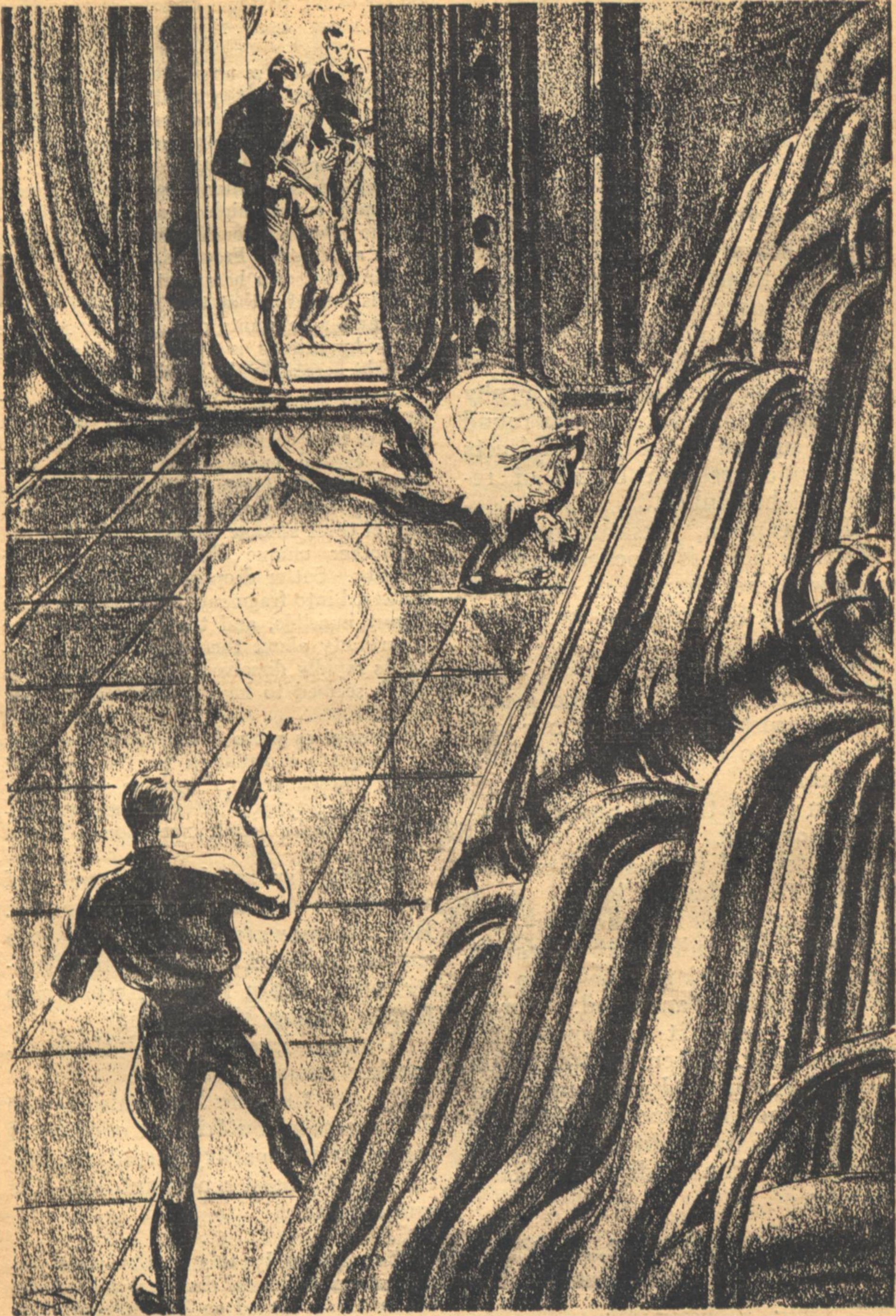
McIlrath touched his cap with two fingers. "Aye, captain."

Frome turned to the two men who had entered with him. "Sutter, prepare for immediate transmission by radio to our main base a short archæological report on the city itself."

The archæologist, already pulling off his heavy garments, clumped across the room to a table.

"Orsatti," Frome said, "you will obilge me greatly if you will tackle a report on this." He opened the knapsack that he carried, took an object from it which he laid on a table.

"Gladly, captain," Orsatti an-



The deadly little gas cloud jerked as if stung —but the gun didn't stop it, or slow it.

swered. "Oh. On *that?*"

There was startled inquiry in Orsatti's voice. Sparks leaned forward to look at the object Frome had laid on the table. A gleam of brilliant ruby lanced out from it. "What is it?" he asked.

"We don't know," Frome answered. "They're scattered everywhere, all over the city. In one place we found them piled three feet high against a door, like a load of coal dumped from a truck. They look like jewels, but they aren't that."

It did look like a jewel, like a ruby as big as a man's fist. It was round and its surface was a mass of facets from which reddish beams of reflected light winked.

"But, captain," Orsatti protested. "My speciality is biochemistry. I am also a metallurgist, of sorts, but this doesn't fall within either of my fields."

"Describe it as best you can," Frome said gruffly. "While I prepare a report on the fate of our first expedition to this triply-cursed city of Torms."

"You found them?" Sparks interrupted quickly.

"We located their ship from the air, before we landed."

"I know that. But the men—"

Frome's lips knifed into a straight line. "We found the men, too."

"Oh," Sparks answered. For a second he stared at the captain, his face working. Then he turned on his heel and walked over and eased his lithe body into the chair in front of the radio transmitter. McIlrath looked at him sadly, but said nothing.

ORSATTI'S report was finished first. He handed the single sheet to the radio man. Sparks read:

The jewellike objects which we have discovered here in Torms seem to be unique. So far as my personal knowledge goes, they have never been reported elsewhere on Mars.

We picked them up all over the city. Apparently the first expedition discovered them, for we found several in their ship, one under the commander's bunk, others near the vessel.

They appear either singly or in groups that may run as high as several hundreds. In one place we found thousands of them piled, as Captain Frome described it, "like coal in front of a basement door."

It is doubtful that they belonged to the unknown inhabitants of this city. A more likely hypothesis is that they have been brought here after the inhabitants died.

In appearance they much resemble gigantic jewels, and at first glance, they seem to have been carved into definite facets. A more careful examination, however, discloses that the facets are natural, and apparently result from the crystalline structure of these strange objects.

Another unique characteristic is their fragility. Sutter dropped one of them. It shattered into fragments so minute as to be almost invisible, and then, to add to our uncertainty about these crystals, the fragments rapidly dissolved into a thin red gas which seemed to have a tendency to flow together.

We have as yet not been able to suggest an adequate explanation for the origin of these crystals or to determine what they really are.—Signed, VINCENT ORSATTI, biochemist with the rescue expedition to Torms.

Sparks snapped a series of switches. A transformer hummed. Radio tubes warmed. He spoke into the microphone. "Rescue ship *Kepler* calling Main Base. Rescue ship *Kepler* calling Main Base."

"Go ahead, rescue ship," the loudspeaker answered.

By the time he had finished the first message, Sutter had completed his report. Sparks started reading the archæologist's account into the microphone.

"Unquestionably this is the most important archæological discovery made since the first ship landed on Mars eleven years ago. It is not necessary for me to recount here the explorations made since that date.

"You recall the eagerness with which the first exploratory efforts were carried out, the hurried, frantic search for intelligent life on Mars. There was never any question that life had existed here. Dust had almost filled the canals, dust covered the sites, but the canals and the sites proved that a race of remarkable scientific achievement had developed on this planet. You recall how our eagerness faded into wonder as the reports of the exploring parties came in. They found cities—with sand drifting down the streets. The condition of the cities indicated that they had been abandoned in a manner which suggested that the inhabitants had slowly fled before an advancing enemy. We found tools scattered everywhere, ornaments, the strange scroll books covered with indecipherable hieroglyphics. But we never found the race that had created these things. We found their bones, dry in the sand. But we never found them. Nor did we find the enemy before which they had fled.

"Nor are there any inhabitants here in this city of Torms. But there is something here that I regard as very significant.

"Here everything is in perfect order. The books are neatly stacked in the shelves, the contents of the few houses we entered are in place, and the tools and engines of the race that built this city are packed in the equivalent of cosmoline, a heavy grease that protects them from rusting.

"Everything here is in perfect order—as if the owners planned to return at some future day.

"A secret is hidden here, a secret that may account for the disappearance of the race that once inhabited Mars. This city is newer than any of the others we have found. It was abandoned last. The clue to the fate of the life on this planet is here.

"Upon the desirability of determining the fate of this people, of solving the vast mystery that shrouds this planet, I need not comment.

"I therefore recommend that a most careful investigation be made here.

"Signed—James Sutter."

Sparks took a deep breath. "End of the second report," he said.

"It sounds interesting," the speaker said. "But have you got any dope on what happened to the first expedition?"

"It will be along in a minute," Sparks answered.

"All right, don't snap my head off," the speaker grated. The operator's voice trailed into suddenly embarassed silence. "Avery, I'm sorry. I—just forgot."

"Skip it," the radio man said gruffly. "I'm not asking for any sympathy." He looked up. Captain Frome, his face looking as if it had been chiseled from granite, stood beside him.

"Transmit this," Frome said. He laid his hand on the radio operator's shoulder, his fingers dug into the flesh.

Sparks didn't feel them. He read the message. "O. K.," he said, "that's what I wanted to know."

Frome's voice was suspiciously husky. "Lad, I'm sorry."

"You can skip that, too," Sparks answered. Frome walked away. The operator's voice droned into the microphone, repeating the message Frome had given him.

"October 16, 2347.—When the radio signals of the first expedition to Torms ceased coming through, we were sent to ascertain if the expedition was in trouble. This is a report of what we found.

"We sighted the ship from the air. It was resting in one of the squares peculiar to Martian cities. We landed as near to it as we could, in a nearby square, and immediately Orsatti, Sutter and myself walked to the ship, leaving Avery, our radio operator, McIlrath, our engineer, and Adams, our cook, to guard our own vessel.

"I regret to inform you that we found the three members of the first expedition dead.

"We were unable to determine the cause of death. There were no wounds on their bodies, but the expression on their faces indicated that they had died in agony. Commander Richard Avery was in his bunk. His legs and arms, stiffened in death, were drawn up in a position that hinted he had been aroused from slumber and had tried to defend himself. However this is merely

an impression. No evidence substantiates it. Samuel Funk, the archæologist, was at the radio transmitter. The impression I received was that he died trying to call for help. The radio set was dead because of power failure, which is utterly incredible, for the power that fed the set was drawn directly from the uranium fission driving engines, which had ceased to operate. In my personal experience this is the first and only time an uranium fission engine has failed to function. I can suggest no reason for this failure. However the engines are dead. We tested them.

"John Orms, language expert who was attempting to decipher the Martian language, was found at some distance from the ship. His tracks in the sand indicated he had fled from the vessel. The same agony was on his face.

"In an effort to determine if the ship had been attacked, we examined the sand near it. No footprints, other than those made by the three men, were found.

"We buried them in the sand of the square in which their ship had landed.

"We will make a complete investigation. It is essential that we know not only what caused their deaths, but what stopped the engines of their ship. Also we will attempt to solve the mystery of this city, as indicated by James Sutter, our archæologist. Signed—MARTIN FROME, captain of the rescue ship *Kepler*."

Sparks' steady voice faltered. He swallowed. Then he spoke again. "This is the end of the transmission at this time." He snapped off the transmitter.

There was silence in the ship. Sparks looked at the radio equipment, saying nothing. He raised his head when a voice spoke.

"Ye're a haard man, Martin Frome." It was Angus McIlrath. In moments of stress the burr of his far-distant homeland appeared in his voice.

"You need not remind me of that fact, Angus," Frome answered.

"Skip it, Angus," said Sparks bluntly.

"But 'twas yer own faither, lad, that they buried there. The least they could have done was to tell ye as soon as they returned—what they had found—instead of making ye wait and learn it from the messages." He turned to Frome. "I say it again. Ye're a haard man."

"This is a hard planet, Angus, and it is a hard trail we travel getting here. It is no place for weakness of any kind—"

"Aye, but—"

"I said to forget it, Angus," Sparks interrupted. "My father was a hard man, too. If he had not been, he would not have been what he was—the first human to set foot on Mars. I know very well what he was called. 'Old find-a-way-or-make-one Avery.' 'Old damn the risk; we're going through.' Whenever anything went wrong—and everything must have gone wrong on that first trip—he had a saying, 'For every evil, nature provides a cure. But she doesn't hand you that cure on a silver platter. You've got to find it yourself, or die.' He hated any show of sentiment, any weakness of any kind. Captain Frome told me my father was dead in exactly the way he would have wished the news to reach me. As to his death, he died as he would have wished, fighting the unknown. He is buried where he would have wished to be—in the sand of Mars."

Silence followed the radio operator's outburst, the awkward silence of men who want to show their sympathy and can't find the words.

"I was on that first trip with him," said McIlrath. "I learned to know him. Ye're his own true son."

"Sorry," Sparks answered. "I didn't mean to blow off steam that way. He wouldn't have liked it. But he was always sort of a god to me, and"—his lips tightened—"something killed him."

The central door opened. The cook stood there. "Come and get

it," he said, "or I'll throw it away."

"Come on," said Sparks bitterly. "Let's go eat."

When they left the room the jewel was lying on the table where Orsatti had been examining it.

When they returned it was gone.

They searched the ship for it. They didn't find it. They didn't even find a tiny opening in the inner hull down near the floor, a hole that looked as if a rivet might have dropped out of it. The hole was no larger than a lead pencil, which was probably why they missed it. There was another tiny opening in the outer shell of the ship.

The jewel was gone.

"Gentlemen," said Captain Frome "tonight we will take turns standing guard."

II.

BUT NOTHING happened that night. No intruder tried to gain entrance to the ship. The wind of Mars, blowing the dry dust of the red planet, whimpered softly around the vessel. There was no other sound.

But what happened the next day made them forget, temporarily at least, all about the jewel that had disappeared so mysteriously.

Early in the morning Sutter and Orsatti went out to continue their investigation of the city. Frome remained in the ship, writing up a complete report. McIlrath, under orders from Frome, had gone to the vessel of the first expedition, to examine the engines. He had returned dourly shaking his head. The engines were dead. He had reported to Frome that he was unable to determine the cause of their failure, and muttering had gone back to his own engine room.

Sparks, on lookout duty at the port, saw the man coming. It was Sutter. He was running.

"We've found them!" Sutter gasped as he came through the inner door of the lock. "The inhabitants of Mars. In a cavern under the city. You remember that door where all the jewels were piled? We shoveled them out of the way and opened it. The Martians are down below. Frozen sleep," he gasped in explanation.

"Then they're alive?" Frome snapped.

"No. Not yet. But they can be awakened, I think. Orsatti says they can and he ought to know. He's down there now." The archæologist was so excited he could not speak coherently.

Sparks knew what this find meant to Sutter. It meant a lot to all of them. One of the big reasons why men had been so anxious to blaze a trail across space to Mars had been to meet the inhabitants of the planet. Photographs taken in 1939 had showed conclusively that the canals of Mars were artificial. Therefore there was life on the sister world across the void.

But when they reached the planet, they hadn't found the men of Mars. Instead they had found desolation and dust and sand. And death. Deserted cities.

If Sutter was right, this was the big moment in the history of the exploration of Mars. Even the arrival of the first spaceship from Earth was not as important as this discovery. His heart leaped at the thought. The long lost inhabitants of Mars had been found!

Frome began jerking on heavy clothing. "Get into your clothes, lad," he barked, "and call Angus. He came here with the first ship and he deserves to be present when we awaken one of these Martians."

Sparks, diving toward the engine room, realized that Frome had given no reason for taking him along. He had said that Angus deserved to be present. The old engineer did. He had suffered all the privations of the pioneer explorers of this planet. He had earned a chance to be present at the historic moment when one of the men of Mars was awakened.

But Sparks knew why Frome was taking him. He hadn't earned his chance. Someone else, who couldn't be present, had earned it for him.

He was only a youth, barely past twenty. Only his superb knowledge of radio equipment had got him a place with the Martian explorers. His father had not opposed his coming. Nor had he helped his son secure the appointment. He had said, "The fact that I am commander of the men exploring Mars, will make no difference so far as you are concerned. You will suffer every hardship that anyone else suffers, you will take every risk. You will eat the same food, sleep in the same hard bunks, drink the same synthesized water, and stand strictly on your own feet. You will ask no favors and you will obey orders implicitly, no matter what they are."

Richard Avery had been a hard man. But he had been a man.

Only Shorty Adams was left to guard the ship. Frome gave him strict orders to be on the lookout.

SUTTER LED THEM at a dogtrot across the silent, deserted city to a low building that had only one door. Ruby crystals were scattered all around the door where he and Orsatti had shoved them out of the way. Sutter dived into the dark

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opening and as the others followed, Sparks saw how heavy that door was. It was at least a foot thick and the other surface was heavily pitted by rust.

Orsatti waited for them down below. "They're here all right," he said. "Each of these cells has a Martian in it. They're in frozen sleep, too. No doubt about it."

The chamber was not large. It had been carved out of solid rock and it had perhaps five hundred coffinlike cells in it. Each receptacle was fitted with a glass top.

"I waited for your permission to open one of these receptacles, Captain Frome," Orsatti continued. "Pending your arrival, I took the liberty of removing the seals from one of the caskets. It's ready to open. Shall I go ahead?"

Frome hesitated. He peered through the glass top, studied the creature that lay within.

"Are you certain these people are really in frozen sleep?" he asked.

"Positive of it. Feel the temperature down here. It's perfect for frozen sleep. That's why this city was in perfect order, the tools put away in grease, the houses closed and locked. These people expected to return to their city when they awakened."

"Well," said Frome slowly, "you May— What's that, Angus?"

McIlrath had stood apart from the others. He had taken a flashlight and poked carefully around the cavern, nosing down the aisles between the receptacles like a wary old hound scenting the presence of danger. Now he spoke.

"I'm thinking that these people had a reason for putting themselves into suspended animation. They didn't come down here and hide away in this gloomy hole for no cause. I don't know what their reason was, but it could have been the last desperate expedient of a race fleeing from some deadly and implacable enemy. If this is true, we had best consider well our action in awakening them."

A little stir of uneasiness ran through the group. Orsatti blinked owlishly. Sutter protested inarticulately.

"Have you seen anything that you might consider an enemy strong enough to force the Martians to resort to frozen sleep to escape it?" Frome questioned.

"I have not that."

"But perhaps their food supply gave out," Sutter protested. "The water supply has been dwindling on this planet for ages. Perhaps a protracted period of drought left them with no choice except frozen sleep or starvation. They chose suspended animation hoping that when they awakened, climatic conditions would be better. Perhaps they had alternate cycles of drought and meager rainfall. This was the way they escaped the drought."

The old Scot shook his head. "Ye may be right. Perhaps these Martians fled from drought. But I remember we came here to rescue three men. We found them dead. One of them had fled from their ship. What he fled from we do not know. But we do know that this race was also fleeing from something."

Again the little stir of uneasiness came. Was the old Scot sensing something that he could not put into words?

Sutter was an archæologist. He had spent years digging into the ruins of Mars. He would not be balked now. "This is superstitious nonsense!"

"It may be that," McIlrath answered. "I think I knew the three men who died here fairly well.

There was little superstition in them. And I know very well indeed that uranium fission engines are not superstitious. But both the men and the engines are dead. You cannot account for that by supersition."

Sutter and Orsatti turned to Frome and began to plead with him to permit the opening of one of the receptacles.

Frome considered his decision. "The whole purpose of our exploration of this planet has been to discover the Martians. Having found them, if we fail to awaken them, our purpose is defeated. Therefore you may open one of the receptacles."

Sutter and Orsatti wasted no time. Frome turned to McIlrath. "I'm sorry, Angus. If you had had a definite reason, we would have waited."

"Aye, captain," McIlrath answered.

SPARKS AVERY watched. He had taken no part in the conversation. Now, in spite of the dry, frigid air, globules of sweat began to form on his forehead. He brushed them away. Now and again his eyes strayed to the heavy pistol that hung at Frome's hip. Frome had opened the flap and loosened the pistol in its holster.

There was a jewel on the floor near the end of the ramp that led downward. It glittered evilly in the sunlight that was beginning to shine into the cavern.

It seemed to the radio operator that only minutes passed before Orsatti had opened the receptacle. Very gently he and Sutter lifted out its occupant.

They laid him on the floor, this man of Mars. The men from Earth clustered about him. He was not quite five feet tall, had a huge chest, and long, spindly arms. He was clad in a soft leather garment and around his waist was a metal belt from which a pouch and a short dagger hung.

"In minutes, he will awaken," Orsatti whispered.

The others were silent. Sparks caught the suppressed tension of that moment. He had been on Mars less than six months, but he had absorbed from his father the lure of the red planet, the vast mystery of it. Now the mystery would be solved. Now Mars would have a voice. Now the red deserts would give up their secrets, now the deserted cities would reveal what had happened in them.

The Martian stirred. A little finger moved, an arm twisted. His chest heaved. The soft sigh of air through long unused vocal chords echoed through the cavern.

"He's awakening," Sutter whispered. "Heavens! What will he say? What will he do? What will he think? How amazed he will be to see us, strangers from another world, bending over him!"

As they watched, the chest movement of the Martian became more regular. The panting heaves that had marked his first gasping efforts for air smoothed into an even rhythm. Spasmodic twitching fluttered his throat.

"Look!" the archæologist's tense voice rang out. "His eyes are opening."

They were brown, an agate-brown. They were filmed and out of focus.

"Easy, old fellow," Sutter whispered. "Here. I'll help you sit up." He slipped an arm under the Martian's shoulder.

The Martian glanced at Sutter, and looked away. The film was gone from his eyes. They were in focus now.

Sparks caught his breath. What

he had seen was incredible.

The Martian had only glanced at Sutter. Then he looked away. His eyes went to the faces of the others. But he only glanced at them, too, glanced casually at them, as if they were of no importance.

Awakening from the sleep of ages, finding himself the captive of a race that obviously did not belong to Mars, he found them not worthy of a second glance.

What was wrong? Couldn't the Martian see yet? Was he blind?

Or, no matter how important were these giants who were bending over, was there something that was more important?

The Martian had large, pointed ears, which he could move at will. He twitched them backward, like a cat listening for a sound behind him. He absolutely ignored the Earthmen. His ears flipped forward, toward the open doorway through which the sun was shining. He listened. There was no sound. He moved his head from side to side, his ears questing for some sound in the cold dry air, his eyes alert for movement.

Sparks found himself listening, too. He heard nothing. But the Martian seemed to hear something. His ears were flipped forward, with the intentness of a cat that has heard the growl of a dangerous dog. But he was no longer listening. He was looking. He saw something. The agate-brown eyes were fixed with terrible intentness on an object near the doorway.

Fear crept over his face, a horror and a terror that was akin to madness. He jerked himself free from Sutter's arms. The archæologist tried to hold him. He wrenched himself free. His hand darted to the dagger at his belt.

It rose evilly upward—and sank in the Martian's throat!

He screeched. The screech died in a gurgle. He fell forward on his face, and a cloud of dry dust puffed from under his dead body.

In the shocked, stunned silence Sutter hoarsely gasped. "We scared him. He saw us, and committed suicide."

"No!" Sparks jerked out. "He saw us all right, but we didn't scare him. He didn't pay any attention to us. There's the thing that scared him!"

He pointed toward the doorway where the ruby jewel glinted in the sunlight. "That's what he saw. That thing. It scared him so badly that he committed suicide." He started to approach the jewel.

"Drop it!' McIlrath's voice rang out. "Don't touch that thing."

Sparks leaped away.

"The lad's right," Angus continued. "I was watching. The Martian paid us no heed. It was yon jewel that scared him."

"But that's preposterous!" Sutter protested. "That jewel is harmless. We'll open another receptacle, revive another Martian."

"Well do nothing of the kind," Frome snapped. "Preposterous or not, this demands a full investigation. When the first Martian we find commits suicide as soon as we awaken him, I'm going to know why he did it before we awaken another one. Sutter, you and Orsatti pick up his body. We'll take it to the ship, make a complete report to our main base, and ask that a large expedition be sent here. Angus, you lead the way. Sparks, you follow him. I'll bring up the rear."

He jerked the pistol from its holster. The click as he slipped a cartridge into the chamber was loud in the silent vault. Overruling Sutter's objections, he ordered them from the vault. They obeyed him.

Somehow, over the field of glittering jewels and through the swirling gas cloudlets, he got the Martian back to the ship—

As he walked up the incline, he picked up the jewel and swiftly thrust it into his knapsack. He closed the door of the cavern as they left.

In the minds of each of them was a single question: Why did the Martian commit suicide? Why had that jewel scared him so badly? Was death, silent and invisible, here in this haunted city? Had the Martians fled from death?

When they reached the ship they found that death was there ahead of them. They found Shorty Adams curled up under the water cooler in his own galley.

He was dead.

III.

SPARKS found him, and called the others. Frome got there first. His examination of the body was swift, but thorough. "This happened almost as soon as we left the ship. There is no wound on his body, no sign to show the cause of death. But his face is stamped with the same agony that was on the faces of the first three."

Methodically he began to search the galley. From an open bin he pulled another jewel.

Frome's face seemed to freeze. He was still wearing the heavy gloves that are standard equipment in the open of Mars. Handling the jewel gingerly, he raised it up to the level of his eyes, squinted at it. Shaking his head, he said, "I can't tell whether it is the same one we brought into the ship last night."

"Do you think, while we were at dinner, Adams slipped into the other room and stole it?" Sutter asked.

"That is not true," said McIlrath flatly.

"How do you know it isn't? It could be true."

"I knew Adams," the old Scot said. "He was no thief."

"But how did it get out of the ship, or where was it hidden? Are you suggesting it moved of its own accord?" Sutter persisted.

"Enough," Frome interrupted decisively. "Something killed him. I am not prepared to say this jewel was responsible for his death. I'm not prepared to say it wasn't. But I am saying this: We're going to our main base immediately, where complete laboratory facilities are available, and we're going to find out what these damned things really are. Angus, prepare your engines for an immediate take-off. Sparks," he barked, "warm up your transmitter and make contact with our main base immediately. Report that we are coming in. Get moving."

Sparks was already racing toward the bow of the ship. As he slid into the seat before the transmitter, he saw, out of the corner of his eyes, the body of the dead Martian where Sutter and Orsatti had dropped it when they entered the ship. The dagger was still sticking from his throat.

The sight sent a touch of eerie chill up his spine. If he had needed anything to remind him that some incredible form of death lurked very near, the sight of the dagger protruding from the Martian provided it.

He snapped the switches, reached automatically for the microphone. When no transformer hum came he snapped the switches again. He was still working with them when Frome entered the room.

"I regret to report," he said, "that our transmitter is dead. The power seems to have failed."

Frome stopped in midstride. He would have halted like that if somebody had suddenly pulled a gun on him. "What's that?"

As Sparks repeated the words, Sutter and Orsatti entered the room.

"But the power for our radio transmitter is drawn from our main engines," Frome whispered. Then he spun on his heel, brushed past Orsatti and Sutter, and was gone.

"What's going on?" Orsatti asked bewilderedly.

"I have a hunch I know," Sparks answered. He pounded after the captain. When he reached the engine room he needed only a glance to see that his worst fear had come true.

"But the engines can't be dead," Frome was saying vehemently. "They *can't* be. It's impossible for

uranium fission engines to fail."

"I know it's impossble," the old engineer replied stubbornly, "but I'm telling you it's happened anyhow."

Captain Frome faced the tense little group. "Gentlemen," he said, "I need not remind you that we are face to face with a new and unknown form of death. Night is coming. We are without power to move the ship or to operate our radio apparatus. There are hundred of miles of dry, deadly deserts surrounding this city, deserts which we could not hope to cross on foot. We have food and water for two weeks. Unquestionably, when our main base cannot raise us by radio, they will send a rescue ship, but it will be a week before a rescue expedition can reach us. If we are to be numbered among the living when it arrives, the price we will pay for our lives is constant vigilance. Pistols will be issued to all of you. Keep them ready at all times."

He paused and looked at the engineer. "Angus, you and Sparks will make every effort to determine the cause of our engine failure and to correct it. Sutter, you will do me a great favor if you will take charge of the galley. Orsatti, I would like you to help me."

"Certainly. What are we to do?"

"We are going to find out what these damned things really are," Frome answered. He pointed to the two jewels. The biochemist paled.

Working on the engines, it was obvious that the old engineer was trying to conceal his fears. To all questions he returned the same answer, a perturbed shake of the head. "I dinna know, lad. It is as if the uranium has lost its power to explode."

"But it hasn't been touched. The seals are in place. If anyone had tampered with it, he would have left marks behind him."

"I know that, lad. And I am remembering that there were no marks on the bodies of the dead men, either."

"But what could have done it?"

"I dinna know, lad. But we must remember this is Mars. There are strange things here on this planet, things that no man can guess. The Martian committed suicide. That was strange. And those ruby jewels are very strange."

"But why were our engines stopped? Were we deliberately marooned here?"

"We cannot begin to guess at motivations," McIlrath replied uneasily. "This is not Earth. The creatures of this planet may have entirely different reasons for their acts than we have."

Then the first shot came. *Bang!* The second one came right behind it.

Somebody was using a gun. His first shot had missed. But he had taken dead aim to make certain the second one did not miss.

Bang! Bang! Bang! Three more shots followed closely on the heels of the second. Whoever was using the gun had missed with the second shot. Now he was emptying the weapon at a charging enemy.

"It's in the main control room," Sparks said. "Come on."

Yanking his pistol from its holster, he raced down the corridor. McIlrath came right behind him. They almost ran over Sutter as he came out of the galley, a gun in one hand and a kitchen knife in the other. The archæologist brought up the rear.

Sparks kicked open the door.

Orsatti lay on the floor. Sparks did not need to see the sick agony

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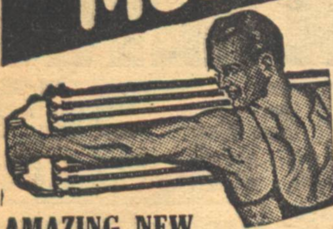

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on his face to know Orsatti was probably dead or dying.

Frome was alive. He stood stiffly erect, his feet wide apart, taking aim with his pistol. Flame lanced from the muzzle and the sharp thunder of the shot smashed through the room.

He yanked the trigger again and the hammer clicked on an empty chamber. With a single motion of his arm he threw the weapon at the thing coming at him.

The sight paralyzed the radio operator. What he saw—was impossible! The thing that moved toward Frome was a two-foot ball of reddish gas. A globe of swirling gas, lit with a baleful red brilliance. The thing glittered with microscopic pinpoints of light. It made a sound as it moved, a high-pitched note like the whine of a distant motor generator.

There were two of the gas balls. One of them was darting toward Frome. The other was down on the floor, on Orsatti's body, and the whine coming from it held a gloating note, like a ghoul feeding.

Everything happened in split seconds. The gas ball streaked toward Frome. A thundering explosion smashed Sparks' eardrums. He saw a pistol poked past him and he knew that McIlrath was firing over his shoulder. He jerked up his own gun and the two pistols spat a salvo.

The gas ball flinched as the bullets hit it, wavered and dodged.

"That's the medicine," Sparks shouted. "Hot lead." He fired again.

Before the third shot had left his gun, he knew the weapon was useless. The gas ball flinched as the slugs hit it, but they passed through it unimpeded. It struck Frome on the chest, clung to him like a leech. His hands jerked up to tear it away, but as it touched him his whole body seemed to be paralyzed, and his arms fell limply. A look of startled

agony writhed over his face. His eyes popped open in sudden horror. He screamed and slumped to the floor.

As he fell, he saw the radio operator standing in the doorway.

"Close that door," he gasped. "Barricade yourself behind it."

Sparks did not move to obey him.

"Save yourselves," the weak words came. "Never mind us. We're done for." The voice found strength in some hidden sources and Captain Frome rasped out his final command. "That's an order. Obey it."

He was the captain. His authority was final.

"Obey it, hell!" Sparks snarled. He leaped into the room, McIlrath and Sutter right behind him.

What happened next was always afterward a blur in Sparks' mind. As a boy he had fought bumblebees in the meadows of Earth. This was something like fighting bumblebees, except that this bee was deadly. Slapping, slugging at the reddish mass of gas on Frome's chest, they tried to tear it loose. To touch it sent jarring needles of pain up their arms. Their hand smashed through it. It swirled and re-formed.

But when the fight was over, Captain Frome was on one side of the door and a reddish mass of gas was singing angrily on the other.

And Sparks was turning back to the door. When he came out the second time, he had Orsatti's body in his arms. He had enough strength left to lay the biochemist down. Then his legs buckled under him and he collapsed.

IV.

When he recovered consciousness the old engineer was dribbling whiskey into his mouth. He tried to sit up but McIlrath pushed him back.

"Lie still, lad, until ye get your strength back."

"But those gas balls."

"Lie still and I'll tell you what we've decided about them."

"But where are they?"

"Forward in the control room whining to each other. Captain Frome thinks he has found out what they are."

"Captain Frome? How is he?"

"Weak as a kitten, but we think he'll live. He says the gas balls came from the ruby jewels, that while he and Orsatti were working with the crystals they suddenly turned to gas right before their eyes—"

"But that's impossible."

The old Scot shook his head. "Captain Frome says the gas balls and the crystals are two different forms of the same life species. He thinks they are similar to the cocoon and the butterfly that we know back on Earth. The crystal is the cocoon stage. The ball of gas is the butterfly stage. He says he thinks they live on radiant energy, and that they attack our engines and us for the same reason."

"But—" Sparks choked off his protest. Frome was a thoroughly capable physicist. And he was not given to idle statements. If he made a statement, he had a good reason to back it up. "What connection is there between our engines and us?"

"There is this connection, lad. The source of power in our engines is the radioactivity of the uranium atom. The source of the energy that keeps the human heart beating is the element potassium, which is slightly radioactive. If you remove the uranium from our engines, they won't generate power. If you remove the potassium from our bodies, our heart stops beating."

"But the uranium was not removed from our engines, and the

bodies of the dead men show no marks of any kind. How was the potassium removed without leaving a mark?"

"It is not the uranium or the potassium that is removed. Captain Frome says these gas balls live on the radioactive emanations, the alpha, beta, and gamma rays, discharged by these elements, leaving them inert. Just as a leech sucks blood, they suck the radioactive discharges. Are you feeling better now, lad?"

Sparks sat up. A wave of dizziness sent his head spinning, but he forced himself to his feet and walked over to where Captain Frome lay on the floor. Frome's eyes were closed and he was breathing in slow, gasping sobs.

Sutter was bending over Frome. "His heart is barely beating," the archæologist said. "Those damned things almost sucked the life out of him."

Sparks said nothing. He walked to the nearest port and looked out. Swift dusk was falling over Mars. Sharp shadows were creeping over the city. Blobs of darkness were huddling behind the buildings. Night was coming over this city where for centuries red death had patiently waited for the last of the Martians to awaken.

The men of Mars had not taken refuse in frozen sleep to escape a drought cycle. They had fled from a deadly enemy. The Martian had committed suicide when he saw that jewel glittering in the sunlight at the entrance to the cavern. He had known what it was. He had preferred to die by his own hand rather than face a more agonizing death.

A movement in the shadows caught his eye. He looked again, to make certain he had not been mistaken. Then he saw what it was—a ball of red gas drifting along a foot or so above the sand. It came out of the shadow and moved directly toward the ship.

Another dead butterfly had emerged, another cocoon had burst.

But they were safe. The stout steel hull of the ship would protect them until a rescue expedition could arrive. They had plenty of food and water. Even if a thousand cocoons released their drifting death, they could not get through the walls of the ship.

SOMEONE breathed heavily behind him. Turning, Sparks saw Angus looking out over his shoulder. The old engineer squinted at the drifting ball of gas. "Another one? I was afraid there would be others. Those two behind that door in the control room have been squealing as if they were calling to others of their kind."

"Do you think they can call others?"

"I dinna know, lad. Back on Earth the moths do it and I doubt if yon red devil came here because of idly curiosity."

The radio operator followed the red monstrosity as it drifted out of sight. He shivered, and said, "Well, we're safe here."

"About that, I dinna know either," McIlrath answered, shaking his head.

It was not so much what he said but the way he said it that sent a sudden chill to the radio operator's heart. But Angus refused to answer his questions. Instead the engineer led him down the corridor to the control room. The door was still blocked. It was a stout sheet of aluminum alloy.

Putty had been plastered around the cracks.

"While you were still unconscious," McIlrath explained, "those devils began to ooze through the

cracks between the edges of the door and the facing. We stopped them up with a bit of putty, but—"

"But what!" Sparks exploded. "You surely don't think they can come through that door?"

"I think they can't, lad," the old Scot answered, "but I remember that door the Martians built to seal their cavern. It was at least a foot thick. But the outer surface was pitted with holes that were almost six inches deep, as if something had tried to eat its way through the barrier, and had failed. It wasn't rust, either, for in this cursed dry desert metal will scarcely rust. So something else must have eaten those holes in that door, and the only thing that could have done—"

He broke off to stare in slowly mounting horror at the door they were facing. At the same instant Sparks saw what was happening.

A tiny smudge had appeared on the gray surface. It looked a little like a drop of acid. It was about the size of a dime, and it was growing in size. As it grew it turned distinctly reddish.

"They are eating their way through the door!" Sparks whispered. He started to slap at the reddish spot but McIlrath knocked his hand away. The engineer seized a wad of putty from the floor and slapped it over the spot. It ceased growing. On the other side of the door an angry whine sounded. "Damn you," he grunted. "That stops you this time."

"Yes, but for how long?" Sparks whispered.

McIlrath didn't answer.

Sutter came running through the corridor. "I just wanted to tell you," he panted. "There are a lot of those things outside. They're doing something to the glass in the portholes, and—"

They didn't wait for him to finish but raced back to the stern of the ship. A glance showed that the archæologist was right. Dozens of blobs of glistening gas floated over the ship. A few were clamped over the glass of the ports. Under the action of some acid they secreted, it was flaking away.

Nobody said anything, but each knew that doom was coming toward them. Slowly but surely the glass in the ports would be disintegrated. If they closed the ports with metal, the monstrosities would eat through the metal. There was no place in the ship that promised safety, with the possible exception of the cook's galley, which was in the heart of the ship and protected by metal barriers on all side. In time even those barriers would fall.

"There's got to be some way to whip those devils," Sparks grated.

Sutter was twitching as if he had the palsy.

Only the old engineer was calm and he spread his hands in a hopeless gesture. "Yes, lad, there probably is. But guns didn't work—"

"Sparks," a weak voice whispered. The radio operator jerked around to see who was calling him. He saw Captain Frome. The captain had spoken. "What's happening?"

The radio man told him. Frome sighed. "I wish I could suggest something. But I can't. Too weak even to think. So I'm turning everything over to you, lad—"

"To me!"

"Yes. I ought to put you under arrest . . . for disobeying me . . . when I told you to save yourself. Instead I'm putting you in charge . . . of the remnants of this expedition. I'm not doing this just because you showed initiative and daring . . . when you saved my life . . . but because you're old 'Find-a-

way-or-make-one' Avery's son. He never let anything stop him. And you're his son. You'll get us out of this mess . . . if anybody can."

The radio man's mind was reeling. Captain Frome was telling him that he was the boss. "But what about McIlrath and Sutter? Will they—"

"I think they will. But let them answer for themselves."

Sutter nodded nervously. "I don't care what's done as long as we get out of here alive."

McIlrath said simply. "I followed your father, lad. You're his own true son. I will not hesitate to follow you."

The surge of exultation that leaped up in Sparks was drowned in the recognition of his new responsibility. Before, he had been taking orders. Now he was giving them. He well knew that Frome had had another reason for designating him as acting captain. Sutter and McIlrath were both too old to respond quickly in an emergency. He was young, his reactions timed to split seconds. And if they were to escape alive, they had to have a leader who could react instantly.

He stood up. "We'll carry Captain Frome into the galley. It's the best protected spot in the ship. We'll take all our emergency equipment in there. We'll plug the porthole with putty. And after that—" But he didn't finish the sentence. He knew the metal walls of the galley would yield in time.

After they had carried everything to the galley, Sparks came back to the stern. McIrath followed him. "What are ye planning to do, lad?" he asked quietly.

"What makes you think I'm planning anything?" Sparks answered sharply.

"Ye've got the same quiet ferocity in your eyes that your father had. When he was planning something dangerous, and didn't intend to tell anybody about it, he looked just exactly like you do now."

"Yeah?" Sparks rasped. "Well, I am planning something, but you can't stop me. You heard what Frome said. I'm in charge now."

The engineer's eyes did not falter. "Ye needn't remind me of that, lad. I'm not trying to stop you. But if I know what it is you're doing, I might be able to help you."

"Oh!" the radio man answered. "I *am* planning something. I didn't tell you because I was afraid you might kick about it—think it was too dangerous. But it's the only way I can see for us to have even a chance to get out of here alive."

"And what is that, lad?" McIlrath asked quietly.

"You remember my father had a saying," Sparks answered. "'For every evil, nature provides a virtue. For every poison there's an antidote. For every disease, there's a cure—somewhere—' There is something that will whip these gas balls, something that will destroy them. They've got a weakness, somewhere!"

"I also remember the rest of that saying. Nature provides a way to cure everything that goes wrong. *But she doesn't hand you that cure on a silver platter. You've got to find it yourself!* I don't doubt there's a way to whip these red devils, but, lad, how are we going to find it in the few hours we've got left?" The old engineer's face was wrinkled into a frown of pleading perplexity.

"By going to the only possible source of information, the Martians themselves. They fought these damned things for centuries. If anybody knows what to do to lick 'em, the Martians do," Sparks answered.

"But they fought and lost," Mc-

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Ilrath protested. "They hid away in a hole. If they had known how to whip their enemy, they would have done it."

The radio man's youthful face clouded. "I've thought of that," he said desperately. "But maybe they ran out of ammunition to fight with. The fact that they put their city in order shows they expected these damned radium suckers to be gone when they awakened. Anyhow, they're our only hope. We can either take a chance that they will know how to whip these devils, or we can sit here and die waiting. I'm damned if I'm going to sit here and wait for one of those things to suck the life out of me. I'm going after one of those Martians. And this one," he finished grimly, "won't commit suicide before we get a chance to talk to him."

"But, lad—"

"But, hell!" Sparks snarled. "I'm going."

He thought the engineer meant to protest his going because he would have to run the gantlet of the growing numbers of gas balls outside. But McIlrath had no such intention. The old Scot knew very well that death lurked outside, but the threat of death had never stopped Richard Avery. Nor would it stop his son. It wouldn't stop McIlrath either. Very calmly he insisted on going along.

"Hell, no," Sparks rasped. Then his voice softened. "I mean, Angus, you had better stay here and help me through the emergency lock when I come back."

"Aye, lad," McIlrath answered. "I'll be waiting for you."

Sparks waited until deep darkness had fallen. Then he slipped through the emergency lock.

V.

A GLOBE of witchfire floated outside the lock. Sparks eyed it. All

over his body he felt his skin writhe. What if one of those things caught him? He knew the answer to that. His heart would stop beating, just as Orsatti's heart had stopped, just as—

He watched the gas ball. It floated away toward the stern of the ship. He slipped to the sand and dropped on his face, crawling up against the hull. A thin whine sounded as another of the creatures passed. Or perhaps it was the same one. Perhaps it had sensed his presence and had returned. He held his breath. Death went on by.

He waited until everything was clear and then dashed across the sand. Panting for breath in the thin, dry air, he reached the shelter of the buildings—and saw a luminosity coming toward him.

He dived headfirst into the sand. Dust rose in choking clouds. The gas ball passed. He lay still, fighting for breath. The dust irritated his nostrils. He began to worm his way forward.

Two hours later he was back at the ship, a bound-and-gagged Martian over his shoulder. He took one look at the vessel, and his heart sank. It was surrounded by hundreds of balls of fire mist. Swirling over the hull, squirming against the ports, eating their way through to the food that lay inside. Hundreds of them. And others were coming.

Had they already penetrated the hull?

He lay down flat on his face and began to worm his way across the open space, the Martian still over his shoulder. The Martian had seen the gas balls. He was whimpering like a badly frightened child.

Would he reach the ship? Or would they see him and dart at him in a swarming cloud? He was now only ten feet from the flier. A quick dash would take him to the lock. He took a deep breath, and lifted himself for the dash.

Then it happened. A gas ball, passing over him, suddenly whined angrily, and looped back toward him, hovering over him like a buzzard investigating carrion. Other luminosities, attracted by the action of the first one, came swirling downward.

They had discovered him.

It was the end. He didn't have a chance in a million. The gas balls were darting at him from all directions. He leaped to his feet, tried to race toward the emergency lock, knowing he couldn't make it.

He tripped and fell. Everything went black. Acid seemed to bite at his nose. He couldn't see. Dimly he wondered—did death come like this, a sudden rushing blackness? He felt no pain.

Something touched him. He screamed. A sharp voice said, "This way, lad."

Sparks gulped in thankfulness. McIlrath! He knew now what had happened. The engineer had been watching from the lock, a smoke projector ready. That rushing wave of blackness was smoke. Smoke! He could hear the gas balls whining as they groped through it. McIlrath guided him to the lock. The outer door clanged shut behind them.

In all his life Sparks had never been so miserable. When he had succeeded in returning to the ship with the Martian, he had thought they now had a chance to live. Instead he had learned that they were doomed. Doomed!

Two hours had passed since he returned. They were all in the cramped galley. Death was eating at the walls around them, death that now was only minutes off.

"I tried to tell you when you left, lad," McIlrath said softly, "but you thought I was trying to keep you from going, and wouldn't listen."

"I know," Sparks nodded glumly, "but hell, I didn't think about this. All I could think was that maybe the Martians knew some way to fight these devils."

"I know, lad," McIlrath answered. "Don't be feeling bad about it. 'Twas a brave thing that ye did. And maybe they do know some way—"

"Yeah," Sparks answered gloomily. "Maybe they do."

He glanced across the galley at the Martian. He was alive all right. Scared half to death but alive. He was sitting on the floor, his back against the wall, his arms and legs bound. His bright, fear-filled eyes darted restlessly over the room. Occasionally he said something in a high, singsong tone of voice. He knew what was eating through the walls of the ship, and he might know something to do about it. Every time he spoke he might be telling them how to whip the radium suckers.

The trouble was—they couldn't understand what he said.

The men of Earth and the men of Mars had met, under desperate circumstances with the future of the planet depending on them, and they couldn't understand each other. The languages were different. John Orms, language expert, had spent eleven years trying to crack the written Martian language, and had failed.

In time, now that they had found a Martian, they would be able to understand each other. But there wasn't time.

Seconds ticked away into nothingness. A red blot appeared on the wall of the galley. McIlrath slapped a wad of putty over it, and looked down at the diminishing supply. There was very little putty left.

Sutter twitched nervously. McIlrath calmly sat down. Sparks glowered at the Martian. To have safety so near, and yet so far away. It was maddening!

Frome, lying on the floor, tried to sit up and fell back. "Could I," he whispered, "have a drink of water?"

They had plenty of water. Sparks drew a cupful from the cooler. The eyes of the Martian followed him as he lifted Frome to a sitting position. The captain drank. "Any luck, lad?" he said weakly.

"No," Sparks answered, "but we're not finished yet. There's some way to lick these damned things and I know it." He rose to his feet. He was lying to himself, trying to lie to them. They were finished. And when the rescue expedition came after them, as it certainly would, it would be finished too. The bones of men would lie with the bones of Martians in the dry deserts, in the dust of the deserted cities. The exploration of the planet, so bravely begun, might well end here. The labor of the men who had fought space to reach Mars, the daring of the pioneers who had braved the deserts, would have resulted only in death.

Then Sutter screamed, an inarticulate screech, the yell of a man who has seen death coming, and knows he cannot stop it.

A red dot, the size of the end of a lead pencil, had appeared on the outer wall. It began to grow in size.

Slowly the archæologist slumped to the floor. He had fainted. The pressure had got too much for him. They let him lie. Death would come easier if he did not know it was coming.

The red dot grew. The galley was silent. In the silence men breathed heavily.

The Martian screeched. Another red dot had appeared on the wall.

"Damn you, shut up!" Sparks rasped. "We're in the same boat—"

He broke off to stare at the Martian. A sudden savage hope sent his heart pounding.

THE MARTIAN seemed to be having a fit. He was twisting and turning and trying to free himself from his bonds. His eyes were darting continuously from the two men to another object in the room. He looked like a dog trying to warn his master that a grizzly bear is lurking on the trail ahead. And like a dog he could only tell what he knew by howling and begging with his eyes.

"He's trying to tell us something," Sparks whispered tensely. He leaped across the galley and cut the ropes that bound the native. The Martian struggled to his feet. He leaped across the room toward—Sparks caught his breath—the water cooler. He drew a cupful of the liquid, turned and splashed it across the red dots growing on the wall.

Something hissed like an angry snake. Hissed and drew away. The dots stopped growing.

"Water," Sparks gulped. "The one thing this damned planet has always needed and never had. Water! Those damned gas balls have evolved in a desert. They can't stand water; it kills them. Sutter was right. The Martians went into frozen sleep because their water supply had given out. The answer was right under our eyes all the time. The very dust that choked us should have told us what to do."

He was screaming now. "There's always a cure for every evil. But

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you've got to find that cure. And we've found it. Take that, damn you! And that."

He was splashing water on the walls, wetting them down. McIlrath and the Martian were helping him. The putty began to slip and fall away. Luminosities tried to surge through the holes. When water struck them, they sizzled like a skillet full of hot grease, burst into steam, and steaming died.

Two Earthmen and a Martian fought side by side, and they used as a weapon the one thing of which Mars for centuries had never had enough—water.

When the rescue ship came knifing down out of the sky, the surprised captain found four weary, happy Earthmen to greet him. Two of them supported the man he recognized as captain of this ill-fated expedition. But when he came to greet Frome, it was Sparks who stepped forward, and gravely saluted.

"Avery, sir, acting captain of the rescue ship *Kepler*, reporting."

The puzzled captain acknowledged his salute. They told him what had happened. "I get that," he said. "You did a swell job. But," he gestured toward the other group. "Who are these?"

"The men of Mars," Sparks announced. "We've found them."

They had awakened the Martians from their frozen sleep. They stood in a large group apart from the Earthmen.

"But what's the matter with them?" the captain asked. "What are they acting like that for?"

The Martians were waving their hands in the air, turning somersaults, twisting and contorting their bodies.

"They're trying to tell you how happy they are to see you," Sparks answered. "They haven't learned how to talk to us yet—but they sure know how to make signs."

BRASS TACKS

The "Leigh" in "Leigh Brackett" is feminine.

Dear Mr. Campbell:

It seems that two or three times a year I must break loose and dissect an issue of Astounding. The victim this time is the February copy.

Well, let's start at the beginning—the cover. Doggone it—you keep giving us covers that can hardly be criticized from an artistic standpoint, but from a science-fiction cover viewpoint I can only say that I prefer one of those super-detailed monstrosities that Frank R. Paul had a habit of doing a few years ago. For cover I like: Wesso, Rogers, Schneeman—by virtue of his superb astronomical cover of some time ago.

Well, in order for the Analytical Laboratory here is how I rate the stories.

"And Then There Was One." Ross Rocklynne surpassed himself with this yarn. He employs a sense of drama I never knew him to be capable of. Easily his best story to date.

"High Frequency War." Harl Vincent is one of the old-timers that has managed to keep his writings in with the new trend in science-fiction. (Don't ask me to define the trend—everyone else has tried and no one has got it yet.)

"The Professor Was a Thief." L. Ron Hubbard is one of my favorite authors. Good as this story is, it does not come up to Hubbard's standard. I especially like his stories in *Unknown*—which, incidentally, I enjoy more than most science-fiction mags.

"Martian Quest," "Locked Out" and "Bombardment in Reverse" follow in order. None of them were really worthy of note. I might say that Leigh Brackett in "Martian Quest" must have bit off a bit more than he could chew. L. Ron Hubbard might have written that story and made it good.

I have not read "If This Goes On—" as yet, so that is why it is not on my list. I could say, though, that it looks good.

How's about more Cartier on illustrations. His cover for *Unknown* was really excellent. No Wesso this issue—*G-r-r.* Rogers, of course, has the obvious fault—lack of detail. That can be remedied, can it not?

Well, that stuff is off my chest now, so I will conclude with thanks for bearing with me this far—if you have.

Thanks for the top stf. mag.—D. P. Bellaire, 684 Royce St., Altadena, Calif.

Schneeman signed the "Blackout" pictures.

Dear Mr. Campbell:

I enjoyed the April issue of Astounding Science-Fiction much more than last issue. The cover is so different from your usual style—but a work of art. Where's

the artist credit line for "Final Blackout"? Fine pictures for a *powerful* story! No science except a study in abnormal psychology, but the *atmosphere!* Too bad to compare two stories in fields so far apart, but "Admiral's Inspection" ties with "Final Blackout" for a four-star first place. What a story!

The other stories rate: 2. "Reincarnate." 3. "The Treasure of Ptakuth." 4. Remaining stories and article tied. I hope someone sees your editorial. I have been waiting for the article on plastics.—L. M. Jensen, Box 35, Cowley, Wyoming.

Jameson was a naval ordnance officer.

Reader's Report, April.

WHERE is the Analytical Laboratory? We want it back.

1. "Final Blackout." 2. "Admiral's Inspection." 3. "Reincarnate." 4. "Repetition."

"The Magic Bullet"—good.

Note to Ross Rocklynne: You don't get sparks from a wood fire-by-friction set. You get a helluva lot o' smoke, some fine wood dust, and—if you're lucky—a small, glowing ember in the center of that dust. From that comes your fire. You see, you—but perhaps I should write an article on making fire by friction. But sparks! *Meester* Ross Rocklynne, how you pain me!

Note to Malcolm Jameson. It was a good story, but you must have been an officer. An enlisted man would tell a different tale of Admiral's Inspection. Something like this—you work yourself to death, by request, you understand, and then the admiral, doddering old wreck, ambles along and looks at nothing. Phooey!—Allen Ingvald Benson, 1417 N. 48th, Seattle, Wash.

And on the other hand—

Dear Mr. Campbell:

A new era has descended upon Astounding Science-Fiction, if not for the majority of your readers, at least for me. I not only enjoy the stories, but understand them, too. This change? It started with the new year, and has progressed on through the first four months of the year and promises to continue to the end.

First, the stories have acquired a greater interest for me because of the lack of super-theorisms that your authors excel in presenting and your readers delight to wallow through with careless abandon and which I, poor thing, must needs sink as in quicksand, due to an utter absence of scientific knowledge—even after these many years of stf. enthrallment—in my vacuous skull. Dr. Smith and his reportedly ultra-super-ultra "Gray Lensman" unfortunately left not the slightest dent in my mentality, except to awaken me to the facts that Rogers did one of the most magnificent cover jobs ever presented.

I don't care for articles because I usually cannot understand their phraseology, therefore do not take time to read them, and seeing this unused space in my monthly mag does much to make me quite repulsed at myself.

Finally I enter a mood of foolish revengefulness. Now, perhaps, you will begin to understand what an unusual dope of a reader you have in me. In fact, if all of the stories in one issue were consumed with enjoyment and understanding by myself, you would—or should—leave the stf. world, for the tales that I appreciate are either snubbed or dubbed so-so-ish by your more informed readers. Enough of my infirmities.

"If This Goes On—" the best serial since "Cosmic Engineers." It far surpassed the hopeless attainments of Williamson and Smith. The only novel by the latter that was really good was "Triplanetary," and the best serial that I ever read in my whole stf. career was "Legion of Space" in '34 Ast.

I knew "And Then There Was One" would be panned because it actually enthralled.

Hubbard's February tale belongs in *Unknown,* this mag, by the by, my favorite of them all.

March issue best in 1940 so far. Schachner did a wonderful characterization in "Cold."

The only stories by the long-winded De Camp I ever liked were the Johnny Black group, the latest one his best, "Hyperpolosity" and the short in *Unknown* concerning the atavistic gentleman in the Coney Island freak tent and his matronly sponsor. Unlike Mr. Rothman, who must be correct, I believed "None But Lucifer" the most boring item ever, possibly excepting "Gray Lensman."

The above is proof of my insanity. Not That I Like It—a good title—but it seems I just don't conform with the group. De Camp should write of me in one of his much-loved stylized epics—The Non-Conformist.

Am leaving "Final Blackout" till all in-

stallments can be had, and then I will have fun. Hubbard always pleases, except "Death's Deputy."

A toss-up for best tale in April between "Reincarnate" and "Admiral's Inspection" —imagine Hidley enjoying Jameson, another of the super boys! "Repetition" second because I'm not sure whether I agree, and shorts tie for third. Serial installments should not be included in the race. Wonder how high the perisphere could go with the combined effort of Messrs, Ley, De Camp, Smith and Vincent? Mars?—Charles Hidley, New York, N. Y.

Smooth roads—with a thumbtack or two in this one!

Dear Mr. Campbell:

Like George Turner's Topsyesque but intriguing Brass Tacker in the January issue, Astounding also "just growed" last year. I had an overdose of the Little Red Riding Hood and Big Bad Wolf era of s-f years ago, but apparently the rest of the field doesn't realize the change, or perhaps they depend more on lurid cover sales than month by month story patronage. So for a will to please, thanks, J. W.

Not that everything was roses and sunshine. Some things irked, like "Blue Men of Yrano," on which already has been lavished condemnation aplenty; or that seemingly endless serial of the three little soldiers fighting a noble cause against the mean old dictators, referring naturally to Schachner's Past, Present, Future tripeology.

That he hasn't been lost on some faraway island of space is saying more for Josh McNab's persistence than his ability. If authors must eat, entertainment should be their work, else they might find "Done in Oil" one of their past experiences, and I'm sure McNab's pater wouldn't care to smell like his stories.

I liked Phillips' "Maiden Voyage." Better, though, did I like Williamson's headliner for February, "Crucible of Power," out of which strode the year's best character, bar even superman Kinnison, Smith's

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facile lensman. Doubtless horrendous echoes are even now in the process of birth. In what other magazine of fictional science would such a figure have been allowed for its hero, and who, of the year's crop of varied characters performed in a more human manner? Small wonder that of the year's best stories, Williamson authored two. "One Against the Legion" was in many ways impressive. For Orban's best—the year's best—book-jacket illustration—Turner disagrees on this point—look to the Legion story. And sly, fattish Habibula takes on a past that is paradoxical to the Legion concept. Impressive and mysterious the great Green Hall still remains, as much so as way back when "Legion of Space" preceded the mighty "Skylark of Valeron" as this year's "Legion" coincidentally precedes "Lensman."

On the subject of book-jacket illustrations, Isip did a fine one for "General Swamp, C. I. C.," Schneeman a bad one for "Gray Lensman." Tastes vary, however, and I find myself in violent disagreement with other Brass Tackers; purely mental of course, as letter writing never appealed as a hobby.

Styled in the manner of tomorrow with a twinge of yesteryear, setting an all-time standard for effectiveness, beautiful as only things cosmic can be, Schneeman's and April's cover topped all of the vaunted "nostalgic" past. Attention holders, good paintings, were covers for February and July by Rogers and Gladney.

In his medium-long "Special Flight," John Berryman showed greater ability in putting words together than in a short later; as did Englehardt in his magnificently fought "General Swamp, C. I. C." Would that both favor us once again with long works. Re the controversy over Arkgonactl, Sungikiki, et al, they're names with local color, longer remembered than such oldsters as Venus City, —burg, et cetera.

Pleasing were two shorts by Schachner, proving he can write, despite Past, Present, Future, "Palooka from Jupiter"—a trifle implausible—and "When the Future Dies." Vincent's "The Morons" and "Power Plant," Del Rey's "The Day Is Done" and Gregor's "Heavy Planet," all stories above the mill run. Good, but with a wavering tendency because of the sameness of purpose of his aliens, were Van Vogt's "Black Destroyer" and "Discord in Scarlet." Another would fail unless its theme be varied.

"Luck of Ignatz," not holding up to its Weinbaumian possibility, lost out through lack of freshness—the female element reeked. "Rust" turned to a pleasant oxide;

"Shawn's Sword" appealed; "Pleasure Trove" intoxicated; "Blue Giraffe" puzzled.

Sorry to see book-jacket illustrations cast aside. Your latest issue shows less atmospheric appeal than formerly. But for the artist credit line, thanks; it's necessary when two such as R. and M. Isip appear together. Your staff now boasts several artists of merit: Schneeman—whose old style seemed better—Kramer, the Isips—all tops. Wesso, whom I could never stomach, still clutter the pages; and why, oh why, do you let him draw spaceships when various magazines have been informed time after time by suffering readers that his spaceships showed a wonderful lack of design? Not knowing how our future ships of the void will actually appear, we still disagree with Wesso. I'm referring particularly to his "Cosmic Engineers" book jacket.

And lastly, but by all means first, is E. E. Smith's "Gray Lensman." Looking backward to "Skylark of Space," when screen after screen would go down before Smith's stupendous adjective attack, and power was even then so prodigious as to be inconceivable, it's slightly bewildering now that power is still on the increase; and for each new protective screen he invents there must be a nullifier. Isn't there a limit somewhere beyond which even E. E.'s thought processes might hesitate to wander?

Following are the ten best:

1. "Gray Lensman"..........E. E. Smith
2. "One Against the Legion" Jack Williamson
3. "General Swamp, C. I. C." Frederick Englehardt
4. "Black Destroyer"......A. E. van Vogt
5. "The Morons"..........Harl Vincent
6. "Crucible of Power"..Jack Williamson
7. "Maiden Voyage".........Vic Phillips
8. "Special Flight".......John Berryman
9. "The Day Is Done"....Lester del Rey
10. "Discord in Scarlet"...A. E. van Vogt

Yours for a good campaign in '40.—E. F. McGill, Patrol Wings, Communication Office, Pearl Harbor, T. H.

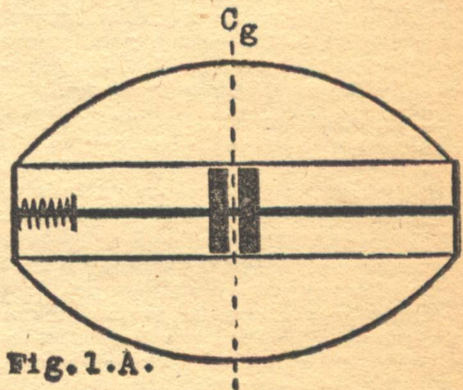
SLIP-STICKERS' DEPARTMENT

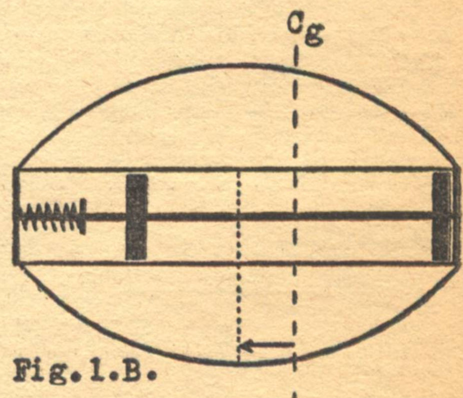
One-shot motors, apparently.

Dear Mr. Campbell:

If Mr. Stanley who wrote that letter in the June issue reviving Harry W. Bull's "reaction motor" that was brought to the attention of the public for the first time in the January, 1935, issue of *Popular Science Monthly*, had any faint hopes that the thing might, after all, work, he is due to be disappointed rather definitely. Because that reaction motor does not work. Or rather it does: *once!* It behaves very much like that "last cartridge" that is frequently the dramatic climax in stories. If in shooting it you accomplish your purpose, all well and good, if you miss you are worse off than before.

It is not very difficult to visualize how that reaction motor will work and fail, if you only make a drawing of it "before and after" and provide this drawing with a line denoting the center of gravity of the





Bull's reaction motor

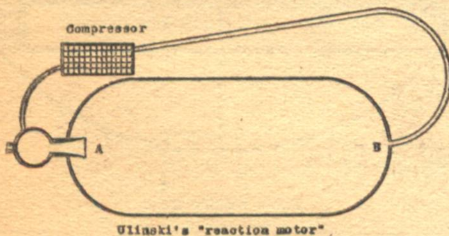
whole affair. In any system of this kind the center of gravity itself is stationary, all that can be accomplished is to shift the vehicle in relation to the center of gravity. When Mr. Bull observed a slight movement of the "ship" in his experiments he attributed this movement to a stronger force from the "im-

pulse" of the weight hitting a spring which was not quite counteracted by the "weaker" force from the "impact" against the solid metal wall. This conclusion seemed to be a perfect explanation for the observed facts, and it was easy to imagine that continued repetition of the procedure would result in continued movement. It would, if the explanation were right.

What really happens is that the spring does not permit the weight to travel as far as the other weight does. In fact that distance is further shortened because the spring will shove the weight back. After all this has happened the picture is that of Fig. 1, b. The weights inside the "vehicle" are distributed in a way that is noticeably different from the distribution in Fig. 1, a. The center of gravity, immovable relative to the ground, runs through another part of the "ship" which consequently had moved for that distance.

Now, after the first starting "shot" is fired you wish to start all over again. It would work just the same a second time, but to make it work you have got to bring the two weights into original position again. Which means that you have to apply a force of some kind—wholly immaterial what type of energy you use and how you do it—and when you have the weights back in their original position *you have also re-established the original center of gravity.* All that can happen is that you shuttle back and forth, a few inches with a model and a few yards with a full-sized machine.

It is interesting that a very similar error was introduced in rocket research by another inventor, the Polish engineer Franz Abdon Ulinski. Ulinski also wanted to discharge the same mass over and over again. His "system" is shown in Fig. 2. He used



Ulinski's "reaction motor"

an ordinary rocket motor producing a jet of gas. But instead of discharging this jet into the open, he proposed a large container, filled with an inert gas—say helium, nitrogen or argon—at ordinary pressure. The reaction of a gas jet in an atmosphere, Ulinski reasoned, is slightly smaller than *in vacuo*, but that loss is bearable since it does not exceed 12-14 percent. Ulinski then wanted to draw just as much gas from this container as emptied into it by the rocket motor. This gas was to be compressed until its pressure exceeded that inside the rocket motor and was then to be added to the gas jet. Ulinski unyieldingly maintained in spite of all attacks that there must be a continuous reaction since the velocity of the gas jet at point A was considerably larger than the velocity of the gas flow at point B. He also emphasized all the time that this machine was not a *perpetuum mobile* because outside energy was continuously added by the compressor. That Ulinski's reaction motor was not a perpetual-motion machine can be admitted without any discussion. But as to the other claims it is unnecessary to waste more space; looks and methods are different, but the principle is the same as in Bull's reaction motor. Both types can be built, of course. They can also be made to *run.* But they won't *work.*—Willy Ley, 304 West 24th Street, New York City.

Hm-m-m—maybe that's why they use slip sticks?

Dear Sirs:

Referring to Murray Lesser's Slip Sticker problem of the streamliner leaving Chicago at seventy miles per hour for New York and the local leaving New York at forty miles per hour for Chicago at the same time and running until they meet at which time which is the closer to New York or farthest from Chicago.

The proper slip-stick solution of this problem is elementary kindergarten stuff. Separate the two parts of the slip stick, place the frame at one end of the table calling that point New York and the slip or slide at the other end of the table calling that point Chicago and imagine the two parts to represent the two trains. Bring them toward each other as though on a single track railroad until they come together. When it will be perfectly plain, of course, that the local from New York is closer to New York than the streamliner from Chicago. For it to be otherwise the streamliner would have to pass through the local which in the case of the slip stick is perfectly possible and that would have to take place after the meeting. Hey?—E. M. Gorrell, Crescent City, Florida.

SCIENCE DISCUSSIONS

Water and mercury don't boil at the same point—but they both do the same thing—boil—if the appropriate individual stimuli are applied.

Dear Mr. Campbell:

Regarding your editorial on what may await us if and when psychology becomes a science:

It is fun to imagine, and it is quite O. K. to have stories based on ant-uniformity in humans—so long as, to make such stories even palatable to humans, the author must introduce a "difference of opinion," a divergence, from somewhere.

That is, roughly, the point—and a point lost sight of when men get to bothering about the menace of psychology becoming a science. So far as it is to become a science, it will study all available facts about the total man, as other sciences must in their field. And diversity is among the facts.

It goes way down—beginning down where Nature indulges in her crap game handing out genes and chromosomes "and things." Say, some future scientific Hitler conceivably succeeds in having all his people handed identical genes (a tall order). Nature would blithely continue her crap game. Evolution did not end away back when. At her leisure, Nature would upset the uniformity. "Mutations." Say, he counters even there—knows just what produces mutations and how, and shields his now-homogeneous race from hard rays—if hard

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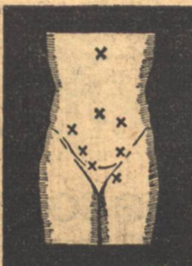

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rays are the complete answer. There remains environment, which begins with conception nine months before his *would-be* homogeneous new crop is born. And if he later insures an *identical* environment for *two* of his subjects, I shall respectfully consider him not a scientist or a dictator or even a mere superman. That is, if "identical" is to be defined rigorously, and it must be to rule out individual differences in response. And if he put his two identicals at different kinds of work, that in itself would change their environment at that point—and their response, to the same degree. Those in similar work would tend to have a similar response, divergent from that called forth by those in another, even given rigorously "identical" stimulus.

It is true that an increased knowledge of psychology might be expected to give increasing knowledge of how to get grossly similar responses, using the term loosely. We are, after all, biologically similar organisms, with similar meeting-points of experience in our individual social heritage. But so long as we are not identical organisms, identical in heredity, identical in the complex syndrome representing all that has happened to us from conception on—every experience modifying us from then until now—it will remain a roughly similar response, with quite enough individual differences from the "norm" to continue to make life interesting.

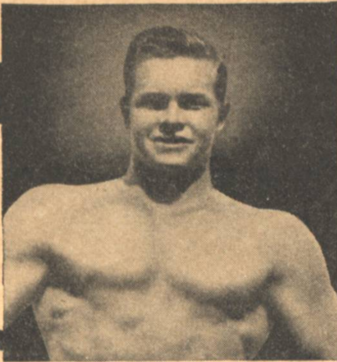
Only, with increasing scientific knowledge—as opposed to the mere addition of "scientific" tricks—would men wish to thwart that tendency toward individual variation, or would they rather, accept it and use it?

It was the nineteenth century and earlier, that believed in stimulus—response—"cause and affect"—I think, to the extent of assuming it absolute law, allowing no exceptions "if only we knew what caused apparent exceptions." Twentieth century scientists are more humble, having greater knowledge.

My own feeling is that "psychology," as it becomes a true science, will not be a "menace" to the divergent-from-norm individual. Maybe less of a "menace" to him than ignorance is. Ever read how little tolerance for the divergent, primitive peoples show? ("Little" being used in comparison to what the observing sociologist is accustomed to.) It is just possible that the rigid-mold dictatorships are less a forecast of the future "under psychological science" than an aftertaste of our past.

Anyway, that is my own "divergent opinion."—W. K. Vernian.

HE Mailed This Coup



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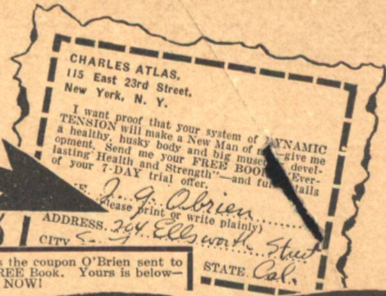

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