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FIRE IN THE HEAVENS

An Amazing Complete Novel
By **GEORGE O. SMITH**

**HOLLYWOOD
ON THE MOON**
A Hall of Fame Classic
By **HENRY KUTTNER**

**A THRILLING
PUBLICATION**

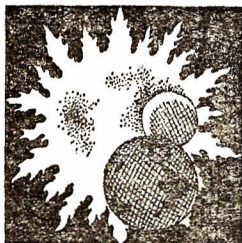
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Vol. 19, No. 3

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FIRE IN THE HEAVENS

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Outside the world of science, Jeff Benson was a man of no importance—until the day he stumbled on the mistake in the law of conservation of energy! 9

Two Complete Novelets

- THE SACRED MARTIAN PIG**.....Margaret St. Clair 78
Delivery of an inanimate object of worship from Mars seemed simple—but it involved George Baker in amazing escapades!
- HOLLYWOOD ON THE MOON**.....Henry Kuttner 108
Drive along Lunar Boulevard and dine at the Silver Spacesuit with Tony Quade in this Hall of Fame classic reprinted by popular demand

Short Stories

- THE UNWILLING HERO**.....Rene LaFayette 98
No hunger for glory lured Vic Harden into the reaches of space
- TRANSCIENCE**.....Arthur C. Clarke 125
Though the world may die, man will go on!
- THE ONLY THING WE LEARN**.....C. M. Kornbluth 129
If we could see clearly, would we hate our future enemy?
- THE LONELY ONES**.....Ray Bradbury 135
A strange woman on a strange planet causes curious complications

Features

- THE ETHER VIBRATES** (Announcements and Letters).....The Editor 6
- THE ROAD TO SPACE TRAVEL** (Station in Space).....Willy Ley 73
- NUCLEAR NUGGETS**.....Carter Sprague 97
- CURRENT FAN PUBLICATIONS**.....A Review 154
- THE SCIENCE FICTION BOOKSHELF**.....A Department 161

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Outside the world of science, Jeff Benson was a man of no importance—until he stumbled on an error in the law of conservation of energy!

a novel by
GEORGE O. SMITH



Lucille turned like a mannequin (CHAP. III)

FIRE

in the HEAVENS

CHAPTER I

Collusion

THERE was a rustle like that of a wind through autumn leaves as Lucille Roman swept into the lawyer's anteroom, where a baker's dozen of hopeful bidders for the physical properties of the Hotchkiss Laboratory were waiting. The fact that the rest

of the bidders were male and that Lucille was unquestionably one of the most decorative young women in her hemisphere accounted for some of the stir.

But to Jeff Benson, occupying one of the uncomfortable wooden chairs along a side wall, the rustle seemed to hold more than the normal masculine reaction to the presence of a magnificent specimen of femininity. There

With the Sun on the Brink of a Nova,

was an undercurrent of anger, of savage resentment, in the whispers that cross-meshed the atmosphere.

"We might as well all go home," the man in the chair to his right muttered.

"What's that?" said Jeff. "Why?"

"That's Lucille Roman," said the man, eyeing her as if he had vivisection in mind.

"I've seen her picture," said Jeff. "Who hasn't? What do you suppose she's doing here. It seems hardly the sort of place a wealthy playgirl—"

"Playgirl, my foot!" The man interrupted savagely. "She's here to bid on the Hotchkiss Lab with the rest of us. And if she wants it she'll get it."

"What do you suppose Lucille Roman wants with it?" said Jeff thoughtfully. Perhaps the ablest builder of precision scientific instruments in America, he had come to the auction not so much because he hoped to be able to buy the laboratory as because he wished the run of its instruments and hoped to make a connection with the winning bidder.

"She's probably got some gigolo on the string who wants to tinker with test tubes," the man on his right said viciously.

"Hey!" said Jeff, surprised. "Isn't that a bit rough on Miss Roman?" His eyes turned to study the assured serenity of her perfect profile. If she was at all aware of the intense feeling her appearance had aroused—and she could scarcely not have noticed it—she was not allowing it to ruffle her poise.

"Do you know her?" the man asked Jeff.

"No," Jeff told him. "I've never seen her before in my life."

"Well," said the man, his voice still low, "she's the roughest, toughest girl in a business deal since David Harum retired. She gets what she wants and heaven help the poor sucker who gets in her way."

He turned away as the man on his other side plucked his elbow. There was a short whispered conversation. Then he turned back to Jeff.

"Would you care to toss in with us?" he asked. "We're going to pool our interests. We'll run up the price to the limit to make her pay for it."

"But—" began Jeff.

"Don't worry," interrupted the man. "If

she's here she'll buy it. But just in case, we'll have enough to cover if she doesn't bite."

"I thought the conditions of the auction specifically forbade combines," said Jeff, frowning. He was a good-looking young man in a quietly intelligent way. He found himself disliking the conspiracy forming around him. Surely a dozen men should not gang up in violation of specified conditions against one woman.

"Lucille Roman is a whole combine in herself," the man said persuasively. "It may be cheating, but if you knew la Roman better you'd be right with us. Take my word for it." He had a bluff air of sincerity which carried conviction.

The door to an inner office opened then and an elderly man with a high-blood-pressure complexion appeared, clad in striped trousers and cutaway and carrying a small stack of cards and envelopes, which he passed out to the bidders assembled in the room.

"As the representative of the trustees of the Hotchkiss Estate," he said in an expensively cultured voice, "I am free to announce that the first sealed bid is in favor of Lucille Roman at forty-five thousand dollars. This will be the second bid. Please write your name and your offering price for the Laboratory on the card. Then seal it in the envelope."

JEFF BENSON took his envelope and card and poised his ball-point pen thoughtfully. Then he scribbled, *No bid. J. Benson*, on the card, stuffed it quickly inside the envelope as instructed and handed it to the man in the cutaway coat.

The latter did not leave the room. He opened the envelopes and removed the cards, glancing at them quickly and shuffling them so that the highest figure offered was held on top. Finally he finished and looked at the man beside Jeff.

"Charles Horne," he said, "has offered one hundred thousand dollars for the laboratory and all of its physical assets."

There was a quick gasp from the others in the room, a gasp composed partly of surprise, partly of suspense.

Horne took a deep breath.

"It's going to work," he muttered to Jeff. "She'll go to one and a quarter. And it isn't

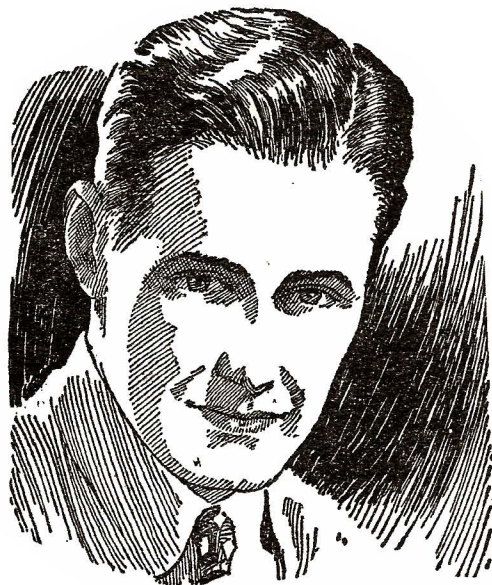
the World Críes — Cherchez la Femme !

worth sixty thousand." He chuckled softly to himself.

"May I ask the status of the rest of the bids?" Lucille Roman inquired in a clear and ringing contralto.

"It's highly irregular, Miss Roman," said the man in the cutaway suit courteously. "However, I feel that I am betraying nothing when I state that your bid was second high."

"Thank you," she replied coolly, as though



JEFF BENSON

a hundred thousand dollars were a mere bagatelle. Jeff, who seldom had one per cent of that amount in liquid cash at one time, found himself admiring her quiet incisiveness.

The attorney in the cutaway coat said, "There will be a third and final bid immediately. Are there any questions?"

Jeff suddenly found himself on his feet, blurting, "Just what was meant by the specific disbarment of combines?"

"It meant," said the attorney, "that each man should bid by and for and solely by and for the interest he represents. A group could bid at the initial offering but was not to combine or pool interests once bidding began. Is that clear?"

"Perfectly," said Jeff. "I should like to state now that I am not acquainted with Miss Roman but I hate to see her—"

"Shut up, you idiot!" snapped Horne from the side of his mouth.

"—taken for a financial ride in this affair," said Jeff, looking down at Horne with a faint smile. To his surprise Horne merely shrugged and returned it.

"It will get you nothing," he said clearly.

Jeff glanced around the room and saw, somewhat to his surprise, that without exception the other masculine bidders were regarding him either with open hostility or contempt. Doggedly, however, he set himself to finish what he had begun. It was not in his nature to quit any course of action upon which he had embarked.

"Mr. Horne," he said, "and some of his—er—colleagues have just combined to run up to almost twice what the Hotchkiss Laboratory is worth. I was invited to join them."

"Is this true?" the attorney demanded of Horne. Horne nodded ruefully.

"It might have worked if our idealistic young friend"—he regarded Jeff with bright shoe-button eyes—"had not chosen to throw a spoke into the machinery." He shook his head a trifle sadly and added, to Jeff, "You'll get nothing out of it—you'll see."

The attorney looked as black as his cutaway coat. "This, if I may say so, is a shocking disclosure, Mr. Horne, if not technically an illegal one. I see no reason to prolong matters further. Since Mr. Horne and his associates have violated the agreement and terms of this auction, I hereby and in order to prevent further chicanery call the auction closed as it lies within my power to do.

"Only the first bids shall be valid, which means that the title and properties of the Hotchkiss Laboratory will shortly be transferred to Miss Lucille Roman."

"Thank you," said Lucille Roman calmly, ignoring her competitors. The attorney hesitated, then walked over to where Jeff Benson was sitting.

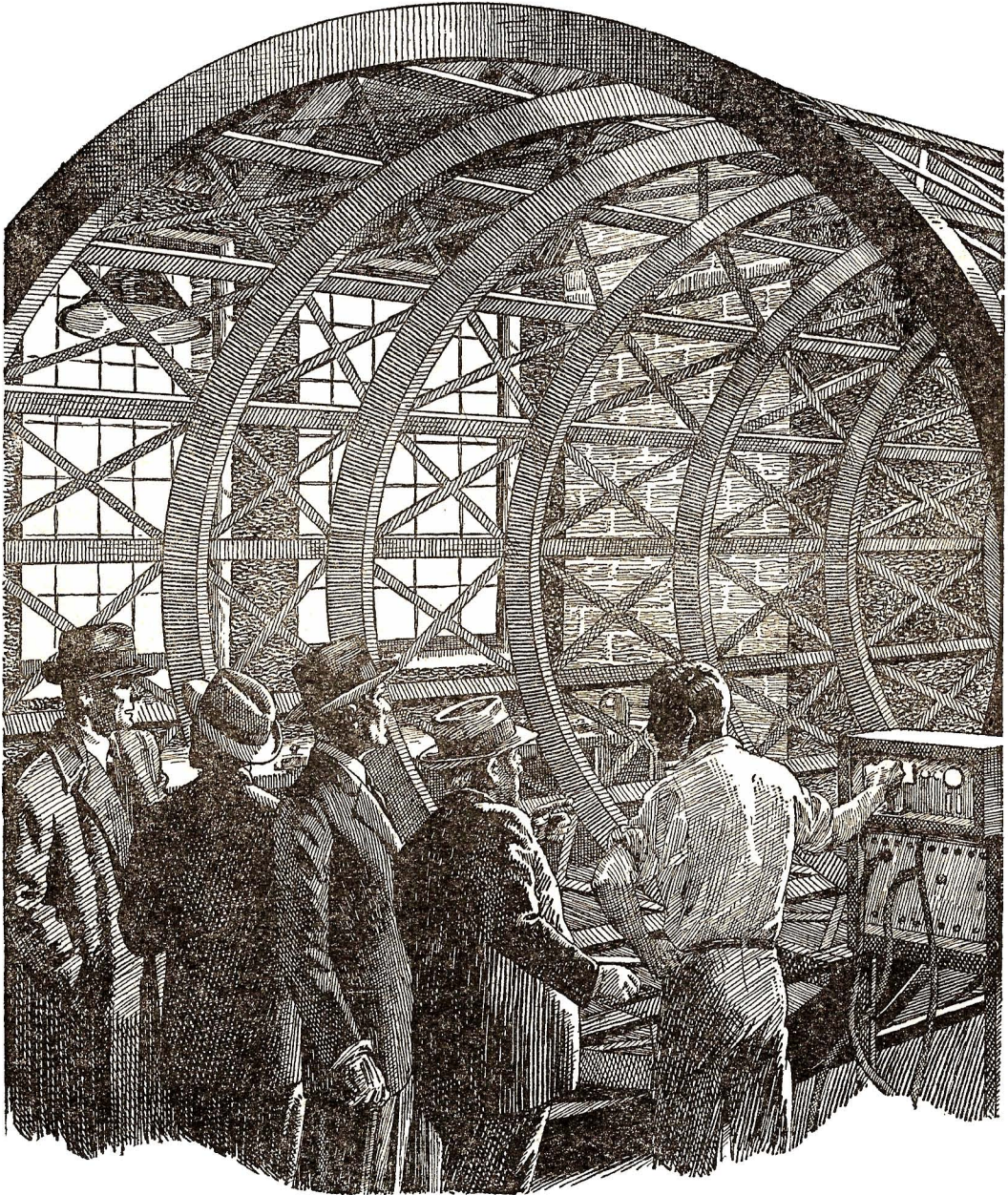
"I believe that the man who saw justice done deserves thanks," he said, extending his right hand. "Everyone likes a good loser. What was your name again?"

"Jeff Benson."

"Oh," said the attorney. He nodded to

himself, then said, "I am very glad to meet you. And, although we all like Miss Roman very much, I'm almost sorry your—er—bid was not high enough to win. You're the sort

Jeff with a grin. "As a matter of fact I never expected to win. So you see Miss Roman isn't taking anything from me. And, I'm sorry to say, I'm not a particularly good



of young man this firm likes to do business with."

"I withdrew my bid on the second round when I learned what was happening," said

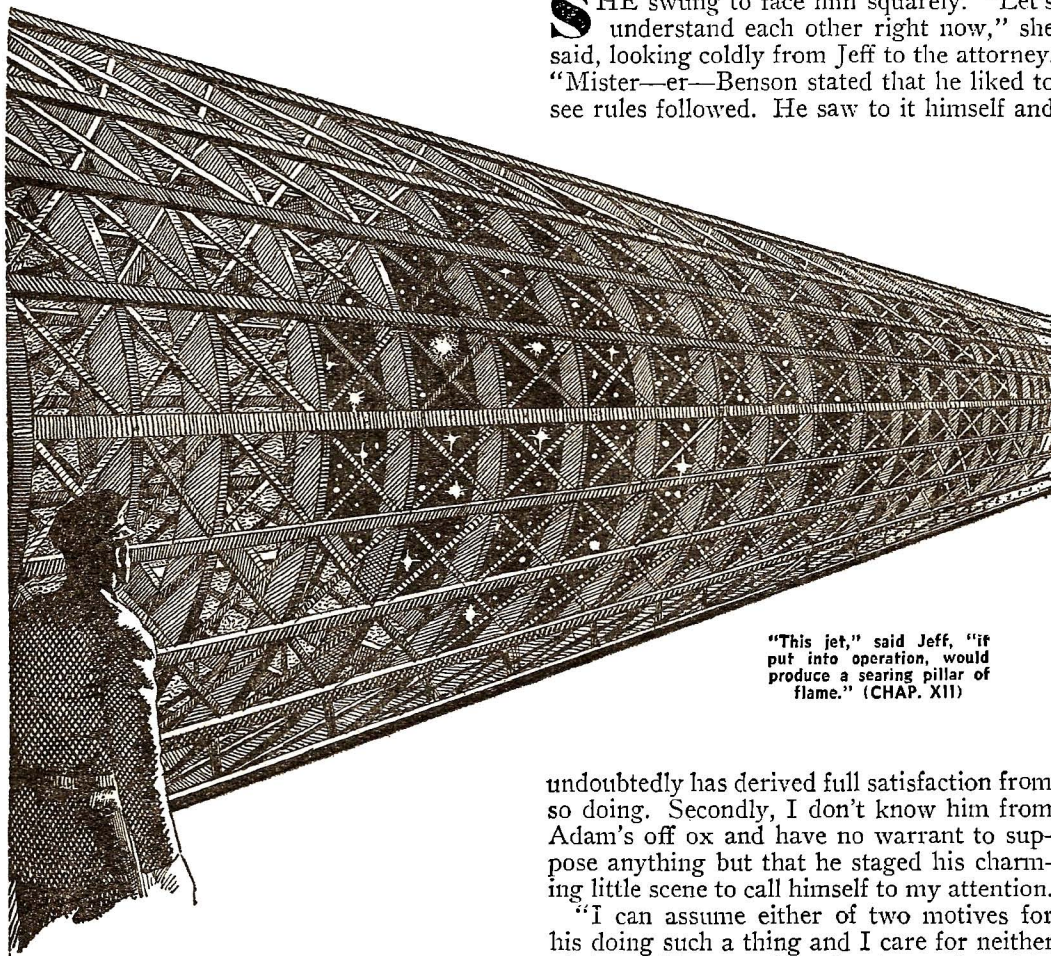
loser. It's just that I believe in playing by the rules."

"But, Mister Benson, your action puzzles me. Why did you enter the bidding at all if

you didn't expect to win?"

"What I really want is a job. I need a bigger laboratory than the one I possess at present to continue certain experiments I've been working on for some time. I'd like a chance to continue these experiments in the greater facilities of the Hotchkiss Laboratory."

"That doesn't seem unreasonable," said the attorney. He turned to Miss Roman. "Is any such arrangement possible?"



"This jet," said Jeff, "if put into operation, would produce a searing pillar of flame." (CHAP. XII)

"Hardly—at the present time," she said as she tugged at her long black gloves. "I take it that the deal is all but closed."

"Oh, quite," said the attorney, visibly nettled. "The rest is mere formality. But, Miss Roman, couldn't you—"

"Then I'll be going," she said serenely. She flicked a casual glance in Jeff's direction.

"Thank you, Mister—er, Bunzen, was it?"

"Benson—Jeff Benson." His answering glance was as cool as hers although he was inwardly seething.

"My apologies. I must leave. But thank you again for your interest in abstract justice. It is very rare." Her voice was an insult as she turned to go.

"But, Miss Roman," said the attorney, patently disturbed. "Surely, you'll—"

SHE swung to face him squarely. "Let's understand each other right now," she said, looking coldly from Jeff to the attorney. "Mister—er—Benson stated that he liked to see rules followed. He saw to it himself and

undoubtedly has derived full satisfaction from so doing. Secondly, I don't know him from Adam's off ox and have no warrant to suppose anything but that he staged his charming little scene to call himself to my attention.

"I can assume either of two motives for his doing such a thing and I care for neither of them. He wanted justice, he got it and he should be very happy. If he wishes a job with any of my enterprises he is free to apply through the regular channels to my personnel director. Good day, gentlemen."

With that she turned on one spiked heel and left the room abruptly.

Jeff blinked. The attorney looked shocked and helpless and flustered. He stuttered as

he tried to apologize. But Jeff managed to smile.

"It's too bad," he said, "but it's hardly your fault." And he followed Lucille Roman from the room.

* * * * *

Jeff Benson let himself into his laboratory with a slight wince of envy. His own place in a large garage was a far cry from the gleaming tables and the polished instruments he knew were in the Hotchkiss Laboratories and he could have used them all. He looked at the thin walls and shrugged. How much energy escaped through them he could only estimate, and his estimate was far beyond his control.

At one end of the laboratory stood a large tank. It was coated with a furry substance and several pipes led from it. One was a lead-pipe, the rest were temperature control pipes to stabilize the contents at exactly—or so he planned—one hundred degrees absolute. He knew it varied and he cursed the crudity of it all.

It should have been in a double tank with a vacuum between and with circulating vanes and a thermo-control that would stabilize the thousand kiloliters of liquid methane at the one hundred degrees absolute and maintain it there within one tenth of a degree. But what can one do in a garage with a limited sum of money?

Ten flow-gauges dotted the pipe that led the methane out of the tank to another chamber. One flow-gauge of high precision would suffice but Jeff Benson read all ten gauges and averaged them. It was not good enough.

He had the same trouble with the oxygen supply.

With a grim smile Jeff Benson opened a valve and pressed a button. A muted roar came. The methane was oxidizing in a chamber that would—nominally—collect the energy released. This energy could be measured with certain limits of accuracy and the conversion factor could be calculated.

If you knew the precise amount of fuel—if you knew the precise initial temperature of fuel, oxygen and the calorimetric chamber—if you released the chemical energy locked in the fuel by combining it with the oxygen—and if you could measure precisely the amount of energy thus released—then you could match the easily calculated energy locked in the fuel against the energy you had measured and you would prove the Universal Law of the Conservation of Energy.

Or if the figures did not match, you could disprove it!

It was five years now since Jeff Benson first had reason to believe that there was a flaw in the law—a minute flaw but none the less a flaw. It was a flaw that had no tricks in it, a true flaw whether applied to atomic energy, chemical energy, electrical energy or sheer mechanical energy. It was a flaw in the law of the conservation of energy and that law includes the conversion of energy into matter and vice versa.

FOR five long arduous years Jeff Benson had been literally burning his money in various manners. His experiments were rough, far too rough. All too often his experimental error exceeded by many times the amount of the flaw.

Sometimes his measurements gave him more energy than his calculations—sometimes his measurements gave him less. A fraction of a percent of error here, plus or minus another fraction of a percent of error there, plus another and another, all added up to a large experimental error.

Yet Jeff persisted because, after five years of experimentation, he found that there was a slight trend toward the minus side. The majority of his answers added up to less energy rather than more.

Statistically it was crude proof that every time potential energy was released as kinetic energy a minute percentage was lost.

Lost—to what and where?

Jeff did not know. Let him measure the quantity accurately first. Let him prove that the same thing happened in electrical devices, in steam engines, in the atomic piles, in the fall of a stone of known weight from a known height. Let him prove this beyond argument and present it to the world of science as proof that another of the so-called immutable laws had been repealed.

Then would be time to ask the question of where and to what it went.

Let him prove his point and Jeff Benson would never again have to choose between a loaf of bread and a gallon of methane or build a thermo-control and wish he had at hand a precision instrument. Then he could have as complete a laboratory as Lucille Roman had purchased.

What did Lucille Roman want with such a lab anyway?

Employment office — melodrama — "right triumphant"—to blazes with Lucille Roman!

CHAPTER II

Reaching Toward Space

MONTHS passed as the data piled up slowly, bit by bit. Each experiment added to the overall average but no real advance was made of Jeff Benson's main problem—the elimination of experimental error. It was a problem in absolute measurement:

To determine exactly what percentage of a large heap of sand lies in a thimbleful one must know precisely the quantity in both the large heap and the minute thimbleful. And both measurements must be of an accuracy far exceeding the expected result. Jeff Benson often felt that he was building watches with a pile driver or trying to engrave his initials on the head of a pin with a garden spade.

While Jeff was struggling over a problem in his crude laboratory Lucille Roman watched progress in the shining place she had acquired. The metal sign over the door now read *Roman* instead of *Hotchkiss Laboratory*. Where a driver could formerly go all the way to the main portal before being stopped Lucille Roman had a guard planted at the gate in the stainless steel fence that surrounded the grounds.

A would-be entrant had to satisfy first the guard, then a few other buffers before he finally got inside the main offices. The top of the fence needed no danger signs—four-inch insulators gave plenty of warning.

Inside there was progress—progress and bafflement.

Doctor Phelps looked away from the eye-piece as Lucille entered but she waved him back, saying, "Finish it, Doc. It may be important."

She sat down and lit a cigarette, casting a glance over the table beside Phelps. There were several pages of paper filled with a tabulation and a number of filled-in notations. A couple of volumes of the International Critical Tables were laid atop one another at the far side of the table and the M.I.T. Spectrograph Wavelength Table was spread open to a middle page. A log-log slide rule was cocked edgewise in the gutter of the book to keep the place.

Phelps turned the knurled knob of the wavelength spectrometer and made another

notation on the pages of notes, then turned to Lucille.

If Charles Horne had been making snide remarks about keeping a gigolo he was dead wrong. Doctor Phelps was a man of slightly over fifty. His head was completely devoid of hair save for his eyebrows and eyelashes and his forehead was furrowed horizontally, a result of deep thinking or squinting into instruments or frowning, though his face was amiable enough.

It was marked with a deep-set pair of caliper-lines that enclosed his mouth, an indication of much smiling during the course of a lifetime. His hands were bony and his fingers were long. They looked as though they should have a bit of tremor but they were rock-steady. Louis Phelps was obviously no gigolo. He had another business and he was quite capable at it.

"What were you doing?" asked Lucille as he left the spectrometer.

"Trying to figure out what it is," he told her, a frown lining his forehead.

"Got any ideas?" asked the girl indolently. She looked out of the window above the spectrograph, where a long thin lancet of brilliance was searing vertically. The window was of a heavy dark glass but the lancet burned through the glass with an eye-blinding whiteness. It was about a quarter of an inch in diameter and fully four feet high to where it tapered to a needle point and died.

Considering that the flame was fully a hundred feet from the little room that housed the pair of them and that it cut through a heavy dark window-glass, the flame must have been intolerable to the naked eye—if not to the naked flesh itself.

Doctor Phelps shrugged and shook his head. "Hydrogen, mostly, or I should say roaring protons. Nitrogen, carbon and oxygen—the latter not too plentiful but not too scarce. Helium—or at least helium after the high-energy alpha particle collects its set of electrons in the upper part of the jet. Of course we know that the jet hurls alpha, beta and gamma in one of the tightest cones known to man right down to its axis."

THERE was a one-inch circle marked on the underside of the roof a hundred feet above the floor. Ninety-eight percent of the radiation from that coruscant jet was encircled by the one-inch mark. And the radiation that fell outside of a ten-inch circle centered on the axis of the jet was negligible.

"Carbon, nitrogen and oxygen," repeated Lucille. "That might just be torn-up air."

"I thought of that but the quantitative spectrograph doesn't give anything like the correct proportions. Frankly, the velocity of that jet is such that one might think we've tapped the sun itself!"

"The sun?"

Doctor Phelps shook his head. "Nope," he said with a smile. "I don't know too much about solar physics, but Russell's investigations show that the sun consists mostly of hydrogen and with a large percentage of the conglomeration known as Russell's Mixture."

Doctor Phelps opened a book and riffled through it until he came to a tabulation. "Russell's Mixture," he said. "Hydrogen we have in plenty—or as I said, high-energy protons. Oxygen we have too but in nothing like the proportions found in the solar mixture. The rest are metals, a half dozen of them. We have none of them in anything but the barest trace. No, Miss Roman. I give up."

"Well, whatever it is we've got it," she said. "And we can use it."

"But I'd like to know what it is."

"Someday we'll find out. Life, Doctor Phelps, is composed of two kinds of people. One kind spends its time trying to find out what makes things tick. The other kind just enjoys the tick for the sake of ticking and to heck with the motives."

"Could be," he said, looking sidewise at her. "And which am I?"

"Up to not-so-long ago you were one of the kind that tries to find out why. I've been doing my best to move you into the other pigeonhole. You'll find life more interesting once you learn that it is more important to use your discoveries instead of handing them to someone else to use while you continue working on them."

"Now, Doctor Phelps, I'd prefer that you forget the problem of what it is and where it comes from and bend your efforts toward the fabrication of eight of these things large enough to handle a couple of hundred tons of spacecraft."

"Spacecraft?"

"Spacecraft."

"You intend to navigate—"

"I do not. I intend only to prove that such a thing is possible, practical and profitable."

"But the chances of finding anything of intrinsic value on any of the other planets

is very small."

"Correct."

"Then why—?"

Lucille Roman smiled. "I wasn't out of three-cornered pants when they were tinkering with rockets. They still have to do more than tinker. I intend to do it."

"But—"

"Why do you suppose they want space travel?"

"Since there cannot be much of value on the other planets or the chance is too low to risk all the money needed, I'd say that about the only value space travel will have is its value to pure science."

"Not entirely. Remember, Doctor Phelps, we are still all bound together on a little ball of mud, which is peopled with a lot of different ideologies that seem to be mutually incompatible."

"And you intend to make migration possible?"

"Pfui!" snorted the girl. "No one could make a living on the moon. Mars is out of line for too many reasons to catalogue in one sitting, and Venus has a fine atmosphere of poisonous ammonia. The rest are still more remote. Migration!" She snorted again.

"Then what—?"

"The nation that controls the moon and space travel controls the destiny of humanity, Doctor Phelps."

"Yes, I see."

"And once I prove that my system works, I can sell the principle to the government for a princely sum. That, Doctor Phelps, is what I had in mind when I bought this lab."

Phelps nodded. He knew she had something planned at the time but could not fathom why Lucille Roman should turn to science and provide him with a laboratory.

"So," she said, "you set to work designing eight of these jets of much larger size. Enough to lift and manipulate a couple of hundred tons of spacecraft."

"But the spacecraft—"

"You'll have to design that, too. Hire a group, get them to work."

PHELPS took one more look through the spectrometer, then shook his head slowly. "I'm a bit dubious," he said.

"Why?"

"Mother always told me that you couldn't get something for nothing," he told her with a half-grin. "We seem to be getting it."

Lucille nodded vehemently. "Them as has



The miniature jet in Jeff Benson's hands drilled a hole in Horne's chest (CHAP. XV)

gets," she said.

"But this isn't right, somehow."

"Why?"

"Because it is a direct violation of the Law of the Conservation of Energy."

Lucille stood up and laughed. "And who'll arrest me for a violation of that law?"

"It must come from somewhere."

Lucille's features became set. "And if someone can't keep his power locked in—that's tough. We've tapped it and we'll use it."

Doctor Phelps turned a dial and the intolerable jet behind the dark glass leaped upward. Nine, ten, twenty feet it lanced, still no more than a quarter of an inch in diameter at its base. Fifty feet it speared and the muted roar of sheer energy penetrated the heavy concrete wall and the floor shook from the strain.

The one-inch circle on the underside of the roof glowed, then burst into white incandescence, running upward in the color until it too could be seen through the heavy glass. Then it melted out of the roof and droplets seared downward into the needle-like atomic flame.

The lance sputtered in great gouts and leaped upward through the hole in the roof as the substance of the metal added its energy to the all-consuming flame. It put a brief searing spire of brightness into the daytime sky above the laboratory and then subsided.

Doctor Phelps turned the power down and the lance became a tiny pencil of coruscant light again.

"No one," he said with an air of finality, "could lose that amount of power without kicking up a fuss to find out where it was going. And no man is ever going to tell me that we can violate the law of conservation of energy."

"To heck with it," said Lucille. "We've got things to do with it besides wondering where it came from. Forget it."

Phelps nodded sadly. He took one last look at the spectrometer and then left, following the girl slowly. Somewhere, sometime, someone must be able to explain this inexplicable thing. But it would not be any man working for Lucille Roman.

* * * * *

"Aluminum," she said. "We'll make it of aluminum."

"That will cost us a fortune."

"Horne has an aluminum interest. Get it from him."

"You mean the man who tried to do you out of the Hotchkiss Lab?"

"The same."

Hannegan shook his head. He was business manager for Lucille Roman, but there were too many facets of the girl's personality and desires to please him—or for him to keep track of.

"You mean the bird that—and we should buy—?" he spluttered.

Lucille looked at him with scorn.

"Look, Miss Roman, I still do not understand."

"Horne has a lot of interests. He's also a sucker for a bare shoulder. Furthermore, after trying to do me out of the Hotchkiss Lab, he'll do anything to gloss it over. He'd also like to get a handful of sticky fingers onto the Roman enterprises one way or another."

"So? You have a plan." It was a statement, not a question. Hannegan knew that much about Lucille Roman.

"He's a punk. He's one of those men that must handle everything himself."

"So?"

"So while he's dizzy from basking in the glory of my smile"—Lucille Roman smiled enticingly—"Charley Horne will find that someone is slowly manipulating the market. By the time he finds out that my shoulder is very cold he'll discover that he has lost his aluminum interest as well as his head. Damn him!"

Her blue eyes blazing, Lucille Roman arose and swept out of the office.

CHAPTER III

Specifications

JEFF BENSON'S door had hardly closed behind the delivery men before he attacked the packing case with a claw hammer. He worked deftly and quickly for a few minutes, removing the boards that had been nailed across the top of the case. He stacked them neatly after removing the protruding nails as a safety measure.

Then, with the tender air of a woman lifting her first-born from its downy crib, Jeff Benson lifted the instrument from its nest in the wooden crate and set it on the bench, somewhat apart from the crude lumber of

the packing case.

It was a beauty. The cabinet was fine-grained walnut, carefully stained and varnished and rubbed to perfection. The panel was of aluminum, coated with a hard-baked black wrinkle enamel. The panel markings, switch positions, operating nomenclature and the name of the instrument and its manufacturer were engraved in the aluminum through the black paint. It was a very tidy job.

White-brass dials were engine-engraved and their calibrations filled with black or red for clarity and identification. The several meters were identical in case. Their different identifications and notations were lithographed and while their numbers and functions were all different the lettering and printing were all in the same style.

It was a far cry from Jeff Benson's own hand-manufactured instruments. And Jeff Benson was proud to add this bit of commercial equipment to his own laboratory.

He was about to step forward to turn a dial after gloating over the gadget from afar when the doorbell rang.

"Blast!" he said, turning towards the door instead of approaching the instrument.

He stepped back from the door with a slight puzzlement. "Yes?"

"You are Jeff Benson?"

"I am."

"May I introduce myself. I am Norman Hannegan."

"How do you do?" said Jeff politely, not knowing what other to say.

"You're the instrument maker who has done some work for the Bureau of Standards?"

"I've done a bit," admitted Jeff.

Hannegan smiled. "I know Tompkins—the fact is we went to Cambridge together. I've a job of work, young man—for you. Are you interested?"

Jeff nodded. "I am," he said.

"Tompkins recommended you," said Hannegan. "I called him and asked him for the name of the best instrument maker in the country. He said you weren't as high priced as several but that your stuff was better than the rest.

"We'd prefer a private enterprise in this deal, Mister Benson. It's a bit on the hush-hush side and a private business should be able to keep it that way longer than a large outfit."

"I think Mister Tompkins is overrating

me," said Jeff. "My stuff is a bit crude."

"But it works. That's the important thing. And may I be the judge of its efficiency? Let's see some of it."

"Sure," nodded Jeff. "This way."

Hannegan looked at first the new instrument. "You didn't make that?"

"The averaging thermocouple? No."

"The what?"

"It's an averaging thermocouple. I have the need of measuring the heat-rise in a large mass of metal and machinery. Several masses, in fact." Jeff grinned. "This thing—well, you install thermocouples in just about every place you can shove one and connect them to the various terminals on the back of this integrating machine.

"It takes the temperature of each thermocouple and averages them all out, giving the normal temperature rise as if the large masses of metal and machinery were all a single block of metal. Follow?"

"Vaguely. I'm a business manager, not a scientist. It's a nice looking device, though. Rather impressive."

Jeff nodded. "I can hardly wait to get at it."

"Need it bad, huh?"

"I could have used it last month. But I'll use it next week, you bet."

Hannegan scratched his head. "You're going to use it next week—but can't wait to get at it now. Want to try it out first?"

"Of course. First I'll have to check the calibration and standardize it. Then I'll have to check the integration and standardize that. Then I'll have to check the correlation so that I can be reasonably certain that it is giving me the right answers."

HANNEGAN shook his head. "Seems to me that a gadget as pretty as that should be right on the button."

"Oh, they are for all practical purposes. But I'm hunting for something rather impractical."

"Even so, isn't that thing about as good as you could get?"

"It's as good as I could get," admitted Jeff. "But I've never yet seen a standard instrument that couldn't be touched up here and there to a greater accuracy."

Hannegan smiled and nodded. "You're the man we want," he said with a laugh. "When the best isn't accurate enough—well, Mister Benson, I represent an interest that intends to build a spacecraft. The designers

of this craft have already specified certain instruments. If you care to we'd like to negotiate with you for their construction."

"I'd like a crack at it. A private interest?"

"Yes but no questions at the present time. It is legal and profitable. On Tompkins' recommendation we are willing to take your word for the fact that you will disclose this to no one, regardless of whether you take the contract or not.

"Therefore I am going to leave a few separate specifications with you for your inspection. I'll call again the day after tomorrow, at which time you'll have been able to look them over and give me a rough idea as to whether you can handle it."

"You'll understand my interest—and also understand my reticence. I prefer to know how I'm working for."

Hannegan smiled. "You will, believe me—but only if you decide to work for us. As soon as you decide that you can handle these things a formal contract will be drawn. You can have your own lawyer present with our blessing. If you decide against it we'll go our own separate ways without telling you our identity."

"But—"

"One more thing. For your trouble in looking over these specifications, if you decide against it, we will offer you a consulting fee. The latter will help to ensure your silence as well as pay for your time, which is no doubt valuable.

"We want fairness, Mister Benson. But we don't want other people to know what we are doing—or that it is being done—until we are ready to announce it. If you decide to join us you'll be one of the family, so to speak, and we can then trust you fully. Understand?"

Jeff nodded. "I'll take it under those conditions."

"Good. You'll find everything in your favor. We pay well for value received."

Hannegan left after that and Jeff ignored his pet equipment in order to look over the specifications for the instruments needed for the spacecraft. This was a sheer matter of groceries, rent, cigarettes and fodder for his chosen work, the latter being no small consumer of what-it-takes.

Jeff did not heartily dislike the jobs that came his way from time to time. Mostly they were lucrative, for a master craftsman in an art not overpopulated drew high fees. It was also a tedious job, for metal and wire

and glass are insensate things that must be honed to a fine degree before they will combine to measure the weight of a fly's breath or the electric potential of two bits of metal suspended in a gas.

Jeff would have given it up had he been able to support his investigations independently. Instead, he worked more hours in a day than most people do in two and enjoyed it all.

He opened the first page of the first specification for a velocity meter based upon the Doppler effect and converted into electrical terms so that a simple D'Arsonval microammeter could be calibrated into feet per second with appropriate shunts to lower the sensitivity of the meter, miles per second. He got no further along than that first page because he had a second caller.

JEFF swore again, and went to the door. This time he stepped aside with wonderment. His caller was Charles Horne.

"Hello," said Horne, extending a hand. Benson looked at it meaningly.

"Take it," offered Horne. "It's offered in lieu of an olive branch. There isn't an olive tree within a couple of thousand miles of Chicago, you know."

"Just what do you want, Horne?" demanded Benson.

"I want to talk to you."

"You're talking."

"Don't be hasty, Benson. Any man can make a mistake. And any man worthy of the name of man can be sorry enough to apologize. So I was wrong, dead wrong and I'd like to mend me a fence or two."

"I see."

"You can't possibly see," said Horne. "Lucille Roman is one of the most graspingly efficient rulers of an economic empire that has come down the pike in a century, even counting her old man."

"So what?"

"Lucille Roman's mother died when she was born. She was brought up by her father. Pappy Roman, instead of hiring high-priced nurses, brought her up to fill his shoes—and she filled them when he died. Now, at thirty, Lucille Roman cares for nothing but being successful. Her father taught her nothing else and she views every man as a direct challenge.

"So, in the course of the last few years, Lucille Roman has come up from behind in deal after deal. She has come out of nowhere

time after time and has come out ahead. She cares nothing for the effects of her assaults upon those she beats out. Each one is just another scalp for her belt. Then she can go on to another triumph."

"What is all this to me?"

"I'm just trying to explain why a couple of us lost our heads and tried to get the best of her. Had you been there as one of us you'd feel as we did—that Lucille Roman had tied her last can to us and to blazes with her."

"Could be," admitted Jeff.

Horne laughed.

"And what did Lucille Roman repay your efforts with?"

"Not much."

Horne laughed bitterly. Then he looked at his watch. "Can I stand you to a bit of lunch, Benson? It's time and we can talk as we eat."

Benson shrugged briefly. Horne had something on his mind and would take his own sweet time to get to it. And Benson was not going to get anything of his own done until the deck had been cleared for action. He might as well eat with Horne and murder two birds with a single stone. Benson was the kind of chap who refused to let much of anything interfere with his eating, which meant that eating time must be spent away from his work anyway.

And another thing—Horne was the kind of man who would take a guest to one of the best places when he hoped to interest said guest in a deal. Benson was a man who was perfectly willing to enjoy briefly the kind of life to which he hoped someday to become accustomed.

"I'll get my coat," he said.

* * * * *

Lucille Roman paused on her way out of the office to speak to Hannegan, who was just entering. "Are we coming on all right?" she asked him.

Hannegan nodded, pleased with himself. "I'm about to let the contract for the instruments and special measurement devices," he told her.

"That's rather a tough one," she nodded. "It is let?"

"No. But practically. I left some specifications with Jeff Benson—"

"Benson? Benson is the man who seems to have been instrumental in getting the Hotchkiss Lab for me, isn't he?"

"Yes."

LUCILLE fixed Hannegan with a cold blue eye. "This decision of yours is not based upon any idiotic feeling of gratitude?"

Hannegan shook his head. "I got Tompkins of the Bureau of Standards to give me the name of the best instrument man in the country. He gave me Jeff Benson."

"What kind of character is Benson?"

Hannegan laughed. "Nuts. In fact, a bit blind to his own ability. He sets great store by the very neatly-packaged instruments made in job lots by formal concerns and then admits that he must rework them before they are accurate enough.

"Furthermore, I've enquired of the commercial boys and they claim that his stuff is superior but that they couldn't duplicate it for mass production because of the cost. They have to cut a corner here and a penny there, you know, while a man making a single instrument can build it the way he wants to and can calibrate it and every part in it to the last lap of perfection.

"Also I'm told that a certain percentage of efficiency is lost in making any given instrument more adaptable to a multiplicity of duties, while a single instrument made by a good engineer for a certain single job does not have this loss in overall perfection.

"Anyway," said Hannegan, "I have a hunch that more than a few times our Jeff Benson has purchased commercial equipment from some company that has previously purchased the designs and prototypes from Jeff Benson and reduced them to mass production."

Lucille Roman nodded dubiously. "You're certain he is the best?"

"Absolutely certain."

"Good. It sorts of levels off. He did me a turn and now, because of his excellence, I can repay him. Emotion has no place in business and it is stupid to be drawn by gratitude into a contract that is not the best. But I'm still a bit dubious about Benson."

"Why?"

She looked at the ceiling. "I'm no mind reader," she mused. "And I do not believe in altruism. I wonder just what Jeff Benson's motives were."

"What do you mean? I believe that he was at the auction of the Hotchkiss Lab for only one thing—to get a contract for equipment from the new owner."

"And," said Lucille drily, "he used his little drama to impress the lovely woman of

his absolute perfection of character so that she would fall into his handsome arms? Or was it a well-planned melodrama to get an edge into the Roman Enterprises? In either case, Hannegan, I dislike wolves, whether gently ingratiating or howling long-fanged types. Benson must be watched carefully. And now I'm off for lunch."

"Same place if we need you?"

Lucille nodded. "Horne hasn't been there for some time. But it's his pet hangout and sooner or later he will return. Do you like the bait?" she concluded, turning like a mannequin.

A plaster saint would have whistled shrilly.

CHAPTER IV

Luncheon for Three

IN A semi-darkened semicircular room on the top of a mountain in California the glorious spectrum of the sun was spread out for ninety feet. Below the splash of color on the wall was a massive tabulation.

Each dark band and each bright band was labelled, keyed and cross-indexed so that every element to be found in the sun was represented. There were notations here too, showing certain elements that were missing from the solar spectrum for diverse reasons.

Visitors watched the vast band of color and looked at the tabulations and then left in sheer wonder that mere man could know so much about his surroundings. It was impressive as well as beautiful and not a few millions of dollars had been pried out of philanthropic funds because their directors had seen this spectacle.

They hoped that their efforts would result in some addition to the tremendous store of human knowledge, realizing that it took much money and brains to add to the wealth of scientific lore at this late date. In an earlier age so much was unknown that any man could make a discovery. But today so much was known that seeking some unknown factor must be extremely difficult.

While visitors marveled at the magnificence of Man's grasp of the unknown an elderly man squinted alternately at a sheet of paper filled with figures and a six-foot strip of color-film mounted before a viewing light on his desk.

Then he looked up at the younger man standing in the office and shook his head. "You're wrong, Harry."

"Wrong, Doc? But the lines do show that it is diminishing."

Professor Lasson smiled. "Harry, there is more than a single reason why any element might begin to display a diminishing quantity in the solar spectrum."

The young man blinked. "I don't see it," he said. "It strikes me that when the quantity starts diminishing, it is a sign that the quantity is diminishing."

Professor Lasson shook his head again. "To digress, Harry, which way do solar prominences go?"

"Up, naturally."

"Have you ever heard of the fall-in theory?"

"The what?"

"Harry, the sun is not a solid, you know. It is a ball of incandescent gas. The theory of the fall-in is that the elements in the upper levels of the sun are completely ionized by pressure and temperature to such a degree that the electrons cannot fall into orbits, which would cause the emission of the characteristic spectral lines.

"Now follow this—suppose that a layer near the sun became cooler by a few thousand degrees. This would permit the gasses to fall toward the sun since a cooling gas contracts and the gravity of the sun could better work on the contracting gas.

Then, in the levels above this phenomena, the pressure is also lowered because the lower levels have dropped into the sun. This permits them to cool also, to a degree where de-ionization may take place.

"Then the level above that cools and drops, recreating the pressure below but permitting the upper level again to cool and de-ionize. Get it? As the pressure gradient drops de-ionization takes place. Layer after layer the upper gasses drop in space, in pressure and in temperature—and as they fall the de-ionization seems to rise.

"This is what is meant by the fall-in theory of solar prominences. Actually nothing is hurled out of the sun but the rise of the band of ionization makes it seem as though something were exploding upward."

"I see. But what has this to do with—"

"Suppose that the temperature of the sun were to rise slightly. Wouldn't the element whose critical ionization level came at that spot be affected? A bit more nuclear energy

and the de-ionization would diminish, which in turn would cause a diminishing of the spectral lines of that element."

"Could be, Doc. But can we be certain?"

Professor Lasson smiled wearily. "No one can be certain," he said. "Most of our observations are based upon sheer deductive guesswork, I fear."

"But it's darned good guesswork."

"About all we can do is watch it, Harry. This is too little evidence to go on, you know. Let's start a sigma curve and be certain. After all, since the dawn of mankind the sun has been unchanging, constant, perfect. Its performance as an engine can be computed for billions of years before and after the present.

Because this is so, anything that would indicate a change in the constancy of the sun must be viewed with suspicion, watched with care to see that we are right before we proceed. Then—if we have located a strange inconstancy—it can be announced with the proper caution so that a panic can be averted."

"This could be the beginning of a nova, Doc."

THE professor looked glum. "Statistically," he mused, "it is assumed that each and every star has an excellent probability of becoming a nova at least once in its career.

"In the case of Sol it may have happened before the dawn of history—may even have been the cause of the planets. Or again, it may happen a billion years after mankind has sung its triumphant song and become but a forgotten impalpable dust."

"But if it is?" the young physicist said with some concern.

"If it is, mankind will certainly die with

celestial fanfare instead of ignominiously by his own damned foolishness."

Harry Welten shrugged and donned a grim smile. "Too bad we have to find out what causes novae the hard way, isn't it?"

Professor Lasson laughed. "And a lot of good it would do us anyway, Harry. But let's not have the earth destroyed by celestial pyrotechnics until we have a bit more evidence under our belt. And for heaven's sake keep any such talk buttoned behind your front teeth. One wrong word and the tabloids will scream 'Doomsday' headlines."

"You bet. But what next?"

"We'll commence a few observations on our own. We can begin measuring the gravitational refraction of light as it passes the sun and we can watch Mercury for an increase in perturbations. If Sol is to become instable it will get instable all over."

Harry left, his head awhirl. And Professor Lasson returned to his page of figures. It was so little to go upon, yet what could one do about measuring the constants of a solar furnace that was ninety-three millions of miles distant and operating at temperatures that could not be sustained on earth?

Only by very clever guesswork!

Or, better, by comparing notes with a woman who knew not where her font of inexplicable energy was spawned and a man who thought he had good reason to suspect a flaw in a universal law— Separate people who, each for his own reason, would not divulge the secret to one another.

* * * * *

A tall iced glass of rare scotch and soda, a very dry martini, a thick and succulent filet mignon (well hung) and the best in coffee were sitting happily on the digestive system

[Turn page]

of Jeff Benson. The fifty-cent cigar and a thimbleful of benedictine and brandy to sip were finishing off a well-balanced meal to the acme of perfection.

Benson was beginning to understand that Charles Horne was not the ring-tailed devil of finance that he had seemed on their first meeting.

Just what Horne was after was still a mystery and Jeff was beginning to think that Horne really had no hidden purpose in his invitation.

Unless, of course, Horne's recent question as to the nature of Jeff's business might be such.

It sounded more as if the financier might be needing some instruments in the near future and was willing to throw some business Jeff's way.

So Jeff explained, "I have my own private project that takes up all my spare time. The rest of the time I make custom-built gadgets for laboratories and the like. Stuff that isn't commercially available mostly—and a bit of free-lance instrument designing for a few of the commercial companies that turn out scientific gear."

Horne nodded thoughtfully.

Behind them, unseen so far, Lucille Roman was biding her time. A frown furrowed her clear brow and she wished that she could know what they were discussing. As Jeff sipped the last dregs of benedictine and brandy Lucille arose from her sofa near the wall and came towards them in a lithe flowing walk. She passed apparently unaware of them, went to a nearby table and prepared to sit down. Then she permitted Horne to catch her eye.

He stood up and smiled.

LUCILLE left her table and came over to him, her smile deliberately fetching.

"Mister Horne," she said in greeting. "And Mister Benson?"

"Hello, Miss Roman," said Jeff.

"Please join us?" asked Horne.

"But you're finished."

"True. But we'll gladly forget it and eat again if you'll join us."

Lucille laughed.

"I just want a sandwich and a cocktail," she told them both.

"Then do sit down. Even our company is better than eating alone."

"Of course," she said brightly. "All's fair in war and finance." She cast a sidelong

glance at Jeff. "Still looking for a job?" she asked.

"I'm always on the lookout for a job," he told her with a smile.

"I'm afraid you have Jeff's meaning wrong, Miss Roman."

"Oh? Then you weren't looking for a job."

Jeff smiled. "Not in that sense," he said. "You see, I'd done some work for the Hotchkiss outfit before it went under and I was hoping I could make a similar connection with the new owner."

"Jeff is a maker of technical instruments," put in Horne.

Lucille Roman laughed. "I owe you an apology then, Mister Benson. It is always my impression that any man who is any good is already employed and kept that way. Now I understand that, instead of being out of work, you were seeking to add a new account to a rather ambitious business."

Jeff nodded and smiled.

The waiter came and Lucille ordered. She accepted a cigarette from Jeff and a light from Horne. Then she leaned back in her chair and looked at Horne through lowered lashes.

"That was almost a neat job, Mister Horne."

"I trust you've forgiven me."

"Of course. For one thing you did not get away with it, thanks to Mister Benson here. For the second I always appreciate a good try. Bucking competition lets me know one more factor I may be up against in the future, and prepares me to cope with it at some later date."

"Then we can meet one another without unsheathing our swords, Miss Roman. I'm glad of that."

Lucille nodded. "There's the off-chance we may be able to do business together someday. Besides, I never carry my business dislikes to the social level. To prove that we'll be friends and use first names. So, until we meet across the business-table, it will be Lucille, Jeff and Charles."

"Good!" cried Horne cheerfully. He flagged a waiter and ordered a full round of cocktails. "We'll drink to friendship," he said.

Her eyes flirted briefly over the rim of her glass as she raised it to them.

Jeff became inwardly uneasy after that. He was attracted to Lucille, yet he could not quite understand her attitude of that day at

the auction. For his efforts in her behalf she had given him a chilly thanks—this in return for having saved her a goodly sum of hard money.

She had apparently looked down upon him at that time and he did not quite accept her bald statements about his job-seeking and its ramifications.

AND now she was accepting him as an equal—at least for the duration of this luncheon. Bothered by her inexplicable attitude Jeff would not permit his interest to deepen, even though Lucille's dress and manner proclaimed her to be feminine, socially interested and possibly affectionate.

But Jeff knew that here was competition he could never hope to beat. He was, he admitted with a grim smile, possibly one of the best-fed starving geniuses in the world but he was by no means financially capable of handling this kind of life.

Fifteen dollars worth of dinner for luncheon was a bit on the steep side and Jeff inferred that not too many minutes would pass ere Charles Horne would nod his head to the long-stemmed beauty with the shoulder-tray and buy Lucille five dollars worth of orchid or gardenias.

Through quiet eyes he watched them. Horne was regaling Lucille with a story and the girl was responding with dancing eyes and a cheery smile.

She obviously thought very well of a man who could meet her on her own level and give her a run for her money in her own chosen line.

Jeff would have liked to join this byplay but he knew that a lengthy discussion of the problems of measuring physical factors would be meaningless to them. He could build a better meter, which they would be able to buy with their pocket money. He could never compete with either of them for a financial empire.

Lucille finished her sandwich and coffee before Jeff broke in. "I've got to run along," he said.

"Don't go," said Horne.

"No, don't."

He smiled.

"I've got some specifications to look at," he said. "One more of these and I'll not be able to see 'em straight."

Horne nodded.

"Business is business," he said. "If you must you must."

Lucille looked unhappy. But she nodded. "If you must," she said.

"I must," said Jeff. "Even though I hate to break up this party."

"It's not broken," said Horne. "If Lucille is through we can drop you off at your laboratory."

Lucille Roman looked up with a smile. "We can," she said, "as soon as I powder my nose."

Lucille Roman went to the ladies' room and found a telephone. "Hannegan," she said as soon as the connection was made. Her voice was hard. "Hannegan, Benson is out!"

"As you say. But why?"

"I've just had lunch with Mister Jeff Benson."

"Lunch? At the Saddle Club? He can't afford—"

"I just had lunch with Jeff Benson and Charles Horne. They had their heads together like the pair of conniving thieves they are and from now on Jeff Benson shall have not one microscopic idea of what I'm doing. I gather that their little game at the auction was just a game, Hannegan. Get another instrument maker."

"That's hard to believe," said Hannegan. "He certainly had his tracks covered well."

"Too well," she snapped. "They're a better pair of connivers than I'd have believed."

Hannegan snorted. "Maybe we'd better jolt the agency a bit, huh?"

"Jolt them hard. If they couldn't uncover that tie-in they're not what I want."

"Okay then. They'll be jolted hard. And I'll turn to Forester for the gadgets. Forester and Company are a trifle more expensive and somewhat less efficient, I'm told."

"But they may be safer. I've got to go. I'm about to match my honor against an aluminum plant."

"That may be risky."

Lucille laughed. "If Horne can get what he wants before I get what I want I lose," she said. Then her voice became soft again.

"He won't win," she said.

Lucille hung up and faced the mirror. Very deliberately she took lipstick and shaded her lower lip delicately until it had a full and sensuous appearance.

A few minutes later she was sitting in Horne's car between Horne and Jeff Benson. Her shoulder pressed gently against Horne's arm as he drove towards Jeff Benson's laboratory.

CHAPTER V

Vanishing Energy

JEFF had had one too many cocktails for absolutely clear thinking and so he ignored the pages of specifications when he returned. In an hour he knew he would be up to it and, to clear his head, he went to work on the averaging thermocouple. He had the front panel off and was probing inside when the doorbell rang once more. He went to the door with a pair of pliers in one hand and blinked at Hannegan.

"I thought you said tomorrow," he objected.

"I did," said Hannegan quietly. "But we've had to make new plans."

"Come in. What's cooking?"

"I hate to disappoint you, Mister Benson, but we've decided to let the contract to another company."

"May I ask why?"

"Of course. Haste has become necessary. We shall be forced to take an inferior product in favor of haste. We'd prefer not, of course but that's the way it stands."

"I might be able to forget my own personal project for a bit," suggested Jeff.

"I believed that to be rather important?"

"No, not really. I've been at work on it for years. Another few months would not—"

"Months would not be good enough, Mister Benson. Weeks, now?"

"I doubt it, though I've not had much chance to find out what is needed."

Hannegan shook his head. "We're sorry."

"So am I. But I'll not starve and even though I could bypass my pet for a few months I'd prefer not to."

"Just what kind of project is it that has been going on for years?"

Jeff smiled. "I'm certain that it is entirely impractical. I doubt that much could be done with it other than to advance the store of man's knowledge a half-step."

"That's a commendable attitude."

"Frankly," said Jeff, "I've reason to suspect a flaw in the law of conservation of energy."

"That's over my head. I was taught that matter and energy could neither be created nor destroyed. I was a schoolboy when they fissioned the atom and I've been uncertain

of the law ever since."

Jeff Benson laughed. "If you remember that matter is one form of energy the law comes out the same," he told Hannegan. "Or did. I have reason to think that every time energy—or matter—is converted from one state to the other there is an infinitesimal loss—a percentage of proportions so small that it hardly makes any difference."

"You mean that for every kilowatt of energy coming out of a hydroelectric plant you lose some?"

Jeff nodded. "Crudely, that's it. An infinitesimal percentage of the available energy in a ton of coal is lost when it is burned. Some of the energy put into the water doesn't get there. Then when the thermal energy of the steam turns the turbine its potential capability is diminished by a similar minute bit.

"The true calculated efficiency of the generator is untrue by a small portion finally, when the electricity is used to create light, for instance, an ultra-microscopic bit of the potential capability of the lamp to produce light is lost."

"But where does it go?"

"I haven't the foggiest notion."

"Small, isn't it?"

"So small as to be inconsiderable. That's what makes it tough."

"I follow that. What you need is something that puts out a terrific gob of energy."

"From what I know there isn't anything on earth that puts out enough energy to make the lost portion worth thinking about. I imagine that from the amount of energy expended in the atom bomb you might get enough of a loss to run a wristwatch for a few seconds."

"Phew! Too small to think of."

"Exactly. I often wish we could get close to the sun."

"That's a lot of power, isn't it?"

"Four million mass-tons of energy per second. We'd get enough to run the earth's needs easily."

"Why don't you try?"

BENSON shook his head sadly. "I don't know where it goes in the first place," he said. "Then I don't know why or how it disappears. And not knowing—to be very honest—whether or not my theory is true, I'm completely at a loss as to how to start. About the only thing I can do is to continue to work on and on until I know

what's what. Then I may be able to do something practical about it."

"It must go somewhere, though."

"True. But where? Or is it just lost—a bit of cosmic friction?"

Hannegan shook his head. "I know all too little of these things. It seems as though it should go somewhere. At least the fraction from the sun's loss should be detectable."

"Maybe not with our present techniques," said Jeff.

"Why?"

"Maybe we don't know what to look for. I'll explain it this way—in the early days of radio we used crystal detectors. Actually these were rectifiers, rectifying the radio frequencies. Suppose there were a veritable torrent of radio power permeating the universe—a constant, unvarying radio field.

"A man putting a bit of phosphor-bronze wire against a bit of galena crystal would note at once an electric potential. This would then be recognized not as the detection of an unknown wave but would be considered a physical property of matter.

"We'd have minute batteries made of galena and wire and possibly we might never know radio, since any small radio energy we could produce would be peanuts compared to the solar furnace or whatever source was making the high radiomagnetic field."

"What's needed then?"

Jeff Benson shook his head. "I'd really hate to see it," he said.

"But why?"

"The chances of a steady-state proposition being detected as being what it is are remote. We'd know a lot about gravity if we could—modulate it. The only way we could seek this unknown wealth of power would be to get some indication that hasn't been available as yet. We must be able to generate something that we can measure, you see. Or at least correlate any variations against our observations."

"I don't see what you're getting at."

Jeff Benson reached in his desk and took out a small H-shaped bit of glass tubing with mercury and wires and liquid in it. "This is a Standard Weston Cell," he told Hannegan. "Its voltage is a constant and it remains constant.

"Now if we were to assume momentarily that the contact potential in any battery was due to the solar loss that fills space and not due to the nature of the beast as we know it, it would be constant just so long as the

sun were constant.

"We'd probably never know the truth until the sun became unstable—at which point we could see that the variations in solar power and brightness correlated exactly with the variations in voltage coming from the standard cell."

"That's reasonable."

"Very," smiled Jeff drily. "But I'd not ask Sol to become a nova for the purpose of proving a theory. I'd rather be an ignorant human being than an intelligent puff of incandescent gas."

"That sounds rough," grunted Hannegan.

"It's what is needed," said Jeff. "And I'd prefer not to be around. Or," he added with a grin, "since I couldn't go anywhere to get out of it, let's reverse that prayer. Frankly, I'd rather the nova weren't around. Well—"

"Ah yes, Mister Benson. I've taken up a lot of your time. I must get back to the office, too. Good-by, young man. And rest assured that if we have need of you you'll hear from us in jig-time."

Hannegan left Benson to his laboratory and raced back to his own office at break-neck speed. He swore impatiently when he realized that Lucille Roman was not there and, since she had finally made contact with Charles Horne, was more than apt to be missing for hours.

Hannegan fumed quietly and strode up and down his office, trying to remember the details of Jeff Benson's theories and cursing his own lack of scientific ken because, as the hours wore on, the details became more and more confused and obscure.

He smoked cigars one after the other, tried to dictate some of the details to his secretary and gave up because what he said made very little congruency. At seven o'clock in the evening Hannegan gave up hope that Lucille Roman would return to the office. He drove to her apartment and waited, in his car, which he parked in the no-parking area before the main door.

AT ELEVEN o'clock Lucille Roman came, driven by Horne.

Lucille was quick on the trigger. As she came from Horne's car she saw Hannegan's coupé in the no-parking area and realized that her business manager had something of importance to tell her. She bit her lip.

She would have preferred to strike while the iron was hot, or to use fisherman's lan-

guage more to the point, would have preferred to set the hook deep on the first strike. But when she saw Hannegan's car she leaned back against Horne and brushed his cheek with the side of her head. She looked up at him, flirting boldly.

"No," she chuckled, "you can't come upstairs, Charles. Not tonight."

"Tomorrow?"

"Luncheon," she said. "But not an all-afternoon luncheon."

"I'll make you a bet."

"I won't take it. But it's been fun, Charles. Thanks, really."

"You don't have to go up right away."

She patted his cheek. "I do," she said.

"Why?"

"Because it's after eleven o'clock. And I'm under a terrible spell. After midnight I turn into a pumpkin."

"Oh gourd!" he groaned.

Lucille pinched her nose delicately between finger and thumb. "After a pun like that," she said, "I'm afraid to be seen with you. Good night, Charles." She leaned forward quickly and brushed her lips against his. He reached for her but she swirled out and away like a ballet dancer, laughed brightly and waved back at him as she headed towards the door.

Hannegan waited until Horne's car was around the corner and then hot-footed into the large apartment building. The doors were all open and Lucille was waiting in the living room for him.

"What?" she asked without preamble.

"That young man is too smart," he snapped.

"He took the bait like a hungry trout."

"Not Horne. Benson."

"Benson? What makes you think so?"

"He tried to pump me."

"Naturally."

"You don't understand, Miss Roman. I expected a certain amount of pumping. I expect it every time we develop a new contract here or there. But this was not personal pumping. He seemed not to care about my business affiliations."

"Then what? What are you driving at?"

"It's far too complex for me to explain in a breath. But—and blast it all, my knowledge of science is topped by any schoolboy—was there, in those specs, anything that might hint at the thing in Phelps's laboratory?"

"Not that I know of. Why?"

Hannegan smiled in self-satisfaction. "I

don't know a lot about science, Miss Roman. But I know how to handle people. When Benson started to talk about his business he skirted a few things that might have been right out of Phelps's lab.

"So I clammed up and tried to find out just how much he knew. The trouble is that I must have done a good job of it, so good a job that I can't recall the scientific details of it all."

"Give me the high points."

"His main talk was about some cockeyed flaw in the law of the conservation of energy. Something about a way to tap the sun if he could figure out a way to do it."

"Phelps is certain that we're not tapping the sun."

"Well, Benson thinks it can be done. Now where did he get that idea?"

"I'll have to ask Phelps. Wait." Lucille went to the telephone and called the physicist. Then, while Phelps was on the way, she showered and dressed in a housecoat, mixed a drink for herself and Hannegan and smoked a cigarette. Hannegan tried three times to recap the conversation, but each time Lucille held up her hand.

"I'm no abstract physicist either," she said. "Marshall your wild-running mind, Hannegan, and save it all for Phelps. Maybe he can unravel the hidden facts."

PHELPS came about twelve-thirty.

"What do you know about Jeff Benson?" Lucille asked him.

"A rather bright young man. Thirty-four or so, single, good natured and, so far as I have ever been able to tell, honest as they come."

"Was there anything in these preliminary specifications that might key together and give Benson a hint of what we've got in your laboratory?"

"I doubt it. There were a couple of incidental gadgets, some isolated testing circuits and so on. But nothing that might be correlated into the final detail."

"Might there be enough to set a man to thinking?"

"Obviously."

"What do you mean?" demanded Lucille.

Phelps smiled. "Benson is a bright young man. A top-notch physicist and engineer. A meticulous workman with a wealth of patience that I have often envied."

"We don't particularly like Benson,"

snapped Lucille Roman. "Supposing you restrict your eulogy to telling us how a few details might lead a man to think?"

"Well," smiled Phelps, "disliking Benson isn't going to make him any less of a good workman."

"Granted. Now go on from there."

"When you hand a good technical man something mysterious in the way of physical gadgetry his first impulse is to inspect it impersonally and critically to see what it will do. Once that is done his next thought is to try to figure out why such a thing must be done."

"And from that he might—?"

"He *might* have a rough idea that we have something new and different."

Lucille turned to Hannegan. "Tell him what you've learned from Benson."

Hannegan, who had been trying to unravel his mixed-up thoughts, shook his head. They were even more muddled than before and would probably become more and more unreasonable the rest of his life.

He made a couple of false starts and then gave a rambling jumble of solar energy, the conservation of energy, four million tons of mass energy per second, a device to average several temperature readings, standard cells, sun spots and crystal detectors for early radio sets. It made little sense to Lucille but Phelps nodded.

"Obviously fishing for fact," he said. "Benson knows something."

Lucille groaned. "Ye Gods!" she said. "I can see myself with two males on my hands."

"Huh?" grunted Hannegan.

"Horne and Benson are in cahoots," she told Phelps. "I'm keeping Horne busy now. I'll have to see to it that Jeff Benson has a fine opportunity to tell me all he knows. While we're at it are you ready to start work on Horne's aluminum interest?"

"I've started. I've laid all the groundwork quietly while you were baiting the trap, Miss Roman. Now we can go ahead if you're certain that Horne is about to forget business for awhile."

"You may go ahead," she said with positiveness. "And you, Doctor Phelps, might give some thought to some fancy tale that will salve Mister Benson's curiosity. Have you any ideas?"

"I'm afraid that anything I said would only lead him closer to the truth. If you recall my jet was the outcome of an attempt to devise a detector for neutrinos."

Lucille Roman shook her head. "Forget it," she said. "We'll close this subject right now."

Hannegan nodded, then said to Phelps, "Can I drive you home?"

"No thanks. I have my own car here."

They left Lucille Roman's apartment together.

CHAPTER VI

Suspicion

JEFF BENSON set his pencil down with a groan. For the fiftieth time he had just gone through the calculations of Fermi and Pauli, which were supposed to show just cause for the difference between the observed energy from radiophosphorus and its calculated energy. For the fiftieth time Jeff Benson groaned because he could not make the figures fit properly.

Years ago Pauli and Fermi had observed this discrepancy. It was a well-known phenomenon.

Phosphorus thirty-two is beta-ray radioactive, emitting positive electrons and breaking down into stable sulfur thirty-two. The difference in mass between radiophosphorus thirty-two and stable sulfur thirty-two is known and the positive electrons should be emitted with energy equivalent to the mass-energy equivalent of this mass-difference. This is a simple thing to calculate and, because no other radio products are present, it was easy to measure the energy of the emitted positive electrons.

They all should have been of a single energy—that of the mass-difference.

But they were not. The energies were spread all the way from the lowest energy that could be measured to the calculated value. The question then was, where did the missing energy go. For here were positive electrons with half of the calculated energy, with one-third the right energy, with other fractions. How about the rest of the energy?

Fermi and Pauli gave the matter thought and decided to postulate a new nuclear particle called the 'Neutrino' which was to have the mass of an electron. Like the Neutron, it possessed no electric charge. Since the neutrino had no electric charge and inconsiderable mass it could not be detected.

Convenient but not too satisfying, at least to Jeff Benson. Agreeing that it was impossible to detect the neutrino Jeff had never begun that experiment. Instead Jeff Benson had gone into physical phenomena to see whether or not there was a discrepancy between calculated energy conversions and the observed energies.

A similar discrepancy would have given many men thought. But all Jeff had to go upon was a rather broad scatter-pattern on a graph that seemed to lean in one direction. It was far less difficult to measure the mass of atoms and the energies of emitted particles than it was to burn a ton of oil and measure the heat accurately.

And so Jeff was stuck at this point and had been collecting mere statistical hints for years.

"Energy can neither be created nor destroyed," he grunted.

Well, according to what Jeff Benson believed and what Fermi and Pauli offered, if matter and energy could neither be created nor destroyed, where did they go, those bits of energy that were lost?

And, he considered bitterly, if we accept Fermi and Pauli and these quantities of energy that escape from a nuclear reaction undetected are sent forth in the neutrino, what difference does it make?

Does a thing exist if it is undetectable, if it exerts absolutely no effect upon its surroundings, if it does nothing but exist because someone thinks it is needed? Is relegating lost energy to a never-never land where it is undetectable and un-recoverable better than losing it entirely?

Forgetting the neutrino, where did the energy go? Or, permitting the neutrino to take off the energy, where did the neutrino go?

"Where," said Jeff aloud to the empty laboratory, "does the vast store of neutrinos energized by Sol go? Or, forgetting the neutrino, where does this energy go—without benefit of neutrino?"

He leaned back in his chair. "I can postulate a sub-space," he said to no one in particular. "A particularly handy subspace where the lost energy is stored and where the suns of the galaxy pour their fatal fraction of loss until the subspace is strained to the bursting point. Then we have a nova.

"Or," he went on sourly, "I'm thinking aloud again. Maybe Fermi and Pauli are right and we do have neutrinos. Let 'em

exist. But if we have neutrinos I still say that the neutrinos do not account for all the energy not detectable!"

THEN the doorbell rang. He went to the door cheerfully, and was completely floored to see Lucille Roman standing there.

"Why—hello," he stammered.

"Hello," she replied brightly.

"And what brings you here?" he asked.

Lucille came in before answering. "I'm just curious, I suppose."

"Good enough reason," replied Jeff. "Curious about what?"

"I suppose it is brash and bold of me but I was curious about you."

"Me?"

"Don't look so surprised, Jeff. I might even sound insulting when I wonder how the other half lives."

"But I—"

Lucille smiled. "Not that, Jeff. It's just that I am surrounded by people who all think alike and act alike. Stocks and bonds and corporations and finance. People who pull strings and make puppets dance—who sit in ornate offices and dictate corporation policy and read reams of reports and listen to the stock ticker. I'm completely at sea regarding people like yourself."

"Shake," grinned Jeff, offering a hand. "I'm as lost in the fog regarding people who think in stock-market quotations."

Lucille took his hand and found it lithe yet gentle—soft enough but rough in two or three very small patches where callouses protected the technician's flesh against screw-driver and pliers.

"Make you a deal," she laughed, looking up into his eyes. "I'll swap you a hot tip on the market for a hot tip on the latest thing in science."

Jeff laughed, joining her. "I must say that of all the people who might have hit that doorbell I least expected you."

"I'd have been here sooner," she told him. "But I've been busy."

"Oh?"

"Is that strange?"

"Perhaps not, but—"

Lucille smiled at him. "I do owe you a favor," she said.

"Forget it."

"Not entirely. I don't intend to do anything rash about it, so you needn't be worried. Now," she added sobering, "let me explain myself. I—"

"Forget the whole thing," he told her. "And start from there."

"Now we're near to quarreling," she said. "I don't want that."

"Nor do I but unless we forget the whole thing we'll go on apologizing for nothing time and time again. So we'll go on from there. I'll mix a drink on it."

"Here?"

"Now it's your time not to be surprised. What do you thing I live on, electrons and methyl-methacrylate?"

"Electrons and what?"

"Lucite, to you." He grinned. He led her into the portion of the large garage that had once been used for office space. It was a sort of mezzanine, overlooking the garage floor on one side and looking into a former automobile showroom in front.

Now, in place of automobiles were a few well-kept tables with instruments on them. Just a few, complete with labels and other assorted gear to demonstrate how they worked and what they did. In the back was Jeff's own workshop and private project.

The former office space had been completely reworked. It now provided a comfortable three-room apartment and bath. "This is where the body parks between electrons," he told her.

It was quite neat but lacked the frippery that a woman would have brought in.

From the refrigerator Jeff took ice cubes and soda. "Parties always end up in the kitchen," he said. "So that's where I always begin. It saves the period of migration."

He mixed the drink deftly and served it to her on the polished enamel of the table top.

LUCILLE was looking around with interest. It may have been living quarters but on the rear wall was a late model of the periodic chart of the atoms which included the transplutonium series up to one-hundred-three. A book on high-frequency transmission lines was stacked beside a well-used copy of the cook book atop the refrigerator and a pad of paper and a pencil were in a niche near the table. The calendar on the wall caught her eye and one eyebrow rose pointedly.

"I'm an idealist," he said with a chuckle.

"And what phase of science does that represent?"

"A series of fourth-order equations in solid geometry depicted on a two-dimen-

sional medium in color," he said dryly.

"And that's that—disposed of in a single definition. I'm interested, truly," she said. "I'd hardly know what to do with myself if business did not keep me busy, I can hardly understand what anybody else does."

"I manage to keep busy," he said. "I'll show you the works. Come on—bring your glass along."

"I didn't realize what you did until we met Charles Horne yesterday. He was good enough to tell me some of it."

"Oh? Does he know?"

"He seems to."

"Perceptive gent," said Jeff. "He was only here for an hour or so."

"I gathered that he knew his way around here."

"Not at all. I've only met him twice, you know. And the first time I met Horne we had a few things to say to one another."

"I saw that."

He laughed. "Horne came to apologize for his rather unethical attitude. Then we went for dinner and we met you."

Lucille tapped a yawn back into her mouth. "I remember that too," she said. The yawn inferred that she and Horne had not parted until late and Jeff assumed the inference.

Lucille was quite baffled by the workshop. She wandered around aimlessly, clapping her hands in pleased glee at something that caught her eye, was properly unimpressed by things that were true feats of scientific note. And while she was asking foolish questions and toying with this knob or that lever, she had a very sharp eye cocked for a trace of the type of equipment that brought forth the lance of energy which burned in Phelps's laboratory.

She saw nothing, yet Jeff had not had much time to do anything if he suspected the truth. Lucille decided upon a bold stroke.

"What about that job you scurried off to yesterday?"

"Job—did I mention that?"

"You didn't mention anything about it. Just that you had your work cut out for you for some time. Can I see something that you're just working on? Which is it?" Lucille peered into the averaging thermocouple instrument, lying there with its case open. "This—?"

"No," said Jeff. "The job fizzled out."

"Oh? I imagine that was quite a disappointment. What happened?"

"Well, there's not too much to tell. They

delivered some specifications in the morn- ing and before I had much chance to do more than ruffle through them Horne came calling. We had a bit of chit-chat. Luncheon, meet- ing Lucille Roman, and so on took up the next couple of hours.

"Then I came back here and took that averaging thermocouple apart and while I was working on that the gentleman returned, saying that since he'd spoken to me his out- fit had decided upon a program of haste. So that was that."

"Too bad. Who was it—or is it a secret?"

"It is a secret and furthermore I know no more than the gentleman's name who gave the specs to me."

"Do people do business that way?"

"Only initially and if they're working on something they want kept quiet. After they let the contract they tell all, of course."

Lucille thought it over. She had little rea- son to believe that Jeff hadn't run through the specs rather thoroughly. She admired his ability to dissemble and made up her mind that if she had not known Jeff Benson and Charles Horne were hand in glove, she would certainly have believed Jeff's story completely. It certainly sounded like the truth.

The fact was that there was one missing key which would have unlocked a lot of the hidden truths. That key was in Horne's own mind. He had followed Hannegan around for some weeks, hoping to learn just what Lu- cille Roman was up to in buying the Hotch- kiss Laboratory.

That was why he had been missing from his usual haunts for weeks on end and, when Hannegan entered Jeff Benson's laboratory, Horne hoped to find the truth there. Which was why and how Lucille Roman met them together.

Suspicion was pyramiding high all because Horne had tried to connive with his cronies.

And it was growing higher, for Lucille be- lieved nothing of what Jeff said. She swore inwardly to think of how close she had been to disclosing her plans to the enemy. And if Jeff had nothing to show of his studies it was no sign that he would not start soon.

Lucille determined to keep one eye on Jeff Benson.

"I'm having a bit of a soirée Saturday," she said. "Please come."

"If I'm not up to my eyebrows in elec- trons," he said.

"Escape from them for a bit. Charles will

be there, you know."

"I didn't know. But I'll try."

No doubt, she thought. "Now," she laughed brightly, "it's my turn to say that I've work to do. I must fly. And thank you for an interesting afternoon."

Jeff Benson saw her to the door.

CHAPTER VII

Laughing-Stock

IT WAS high noon in California. The sun blazed out of a cloudless sky and heated the ground and the backs of people who basked in it.

It seemed quite normal. People who had been there for years and years did not realize that the sun had begun to grow brighter at eleven o'clock, and had arrived at a figure almost three percent higher in brilliance by noon. At the level of energy that Sol puts out three percent more would excite the notice of no laymen. Any abrupt change in brightness might cause comment but three percent of something that is already nearly intolerable made it only slightly more nearly intolerable.

At noon it leveled off, then gradually be- gan to resume its age-old level of output.

One laboratory caught the change and the superintending solar physicist swore at the recording film and wrote a tart letter to the film company for not producing consistent film. Another laboratory head raised hob with a student for not paying attention to his work. A third laid the incident to the un- seen devils that creep into any experimenta- tion and make it necessary to do anything fifty times before a result could be assumed.

Professor Lasson looked meaningly at Harry Welten and shook his head.

At three o'clock in the afternoon Sol was once more his bright consistent self. The matter was either forgotten or ignored by all save Lasson and his student assistant.

"That proves something," said Harry Welten.

"It does."

"But what are we going to do about it?"

"What can we do but measure the deuce out of it—and hope that it means nothing."

"But if it is a nova?"

Lasson smiled. "Then the universe will

watch our death throes," he said.

"But—"

"Bolts!" said Lasson, tartly. "What can mankind possibly do to clap a safety valve on a bursting sun?"

"I don't know."

"I do. Not a blessed thing. Hell's Eternal Fire, Harry, we don't even know what causes a nova."

"Maybe we will," said Harry gloomily.

"Well, we can die intelligently," said Lasson.

"Fine prospect."

"Now look, Harry. We don't know that it is. And I, for one, am not going to toss everything I've worked for out of the nearest window into the deep blue sea because the chances of a nova happening right now lie somewhere near a couple of billion to one against. I'd hate to throw everything away only to find out next week that I'd thrown it away. Then I'd have to live out the rest of my life realizing I'd been stupid."

"But what else could it be?" said Harry Welten.

"A couple of planetoids might have bumped into Sol. We'd detect nothing by observation if that happened, you know. We couldn't see 'em."

"That's possible."

"And more likely than nova. Shucks, sonny, you'd swell up a bit in anger if someone stuck a pin in you."

Harry laughed. "Maybe we should get after the guy who is shoving pins in Sol."

"That's the spirit."

"So what do we do next? Put an ad in the Chronicle—'Notice: Will practical joker please cease stirring up Old Sol? He's restless.'"

"That kind never reads the personal ads," chuckled the professor. "Howthesoever, Harry, I'm going to get some new gear for the lab. I know about what we need and I'm going to hop over to Chicago for a bit and see Jeff Benson."

Fifteen years before Professor Lasson had had a student named Benson who had graduated with honors. For that reason and because Jeff's stuff was superior, much of the special equipment in the laboratory bore the small Benson nameplate. Had Professor Lasson been young and filled with needless enthusiasm he would have flown at once.

BUT Lasson knew that a few hours or a few days would make little differ-

ence. If the sun were going nova it would take off slowly at first and it might be months or even centuries before its inner activity reached the blow-up point. Nothing could stop it.

Furthermore, Sol was not a constant thing. It was variable in degrees. There was a slow flow towards being brighter and hotter and a few slight changes might only be isolated cases in the grand scheme of things.

So, instead of leaving for Chicago that very moment, Professor Lasson began to prepare for his trip. If all went well he could clean up a lot of niggling little details and catch a Chicago-bound train in about three weeks.

* * * * *

Jeff Benson entered the super-apartment of Lucille Roman with a feeling that he shouldn't have come. He also had a feeling that he should have been wearing a tuxedo or something appropriate for the formal afternoon.

The best he could do at the moment, since he was not in the habit of going out in high or even medium society, was a gray pin-stripe suit, a conservative necktie, and a white starched shirt. His shoes were polished within an inch of their leathern lives and he himself was quite uncomfortable about it all. He felt foolish.

This was not his kind of life and he knew it far better than anybody else. He was, and he admitted this, the intellectual equal of any man he was likely to meet anywhere. But his intellect was on another plane entirely.

Lucille Roman's friends would probably quote the market to him in the terms of the trade and be completely misunderstood. He, on the other hand, could reply regarding the quantum state of the seven-times ionized iron atom and be equally misunderstood.

The trouble with that idea was that there would be more of their kind than his present, which would label him a freak among financiers.

It is possible that Jeff would have been uncomfortable had he been the kind who was always at ease in any company. Even the most self-assured fish in the world is miserable when so far from its own kind of water.

He was happily disappointed. Lucille met him at the door and handed him over to Horne. Horne greeted him cheerfully.

"Long time no see," he said. "How've you been?"

"About the same. A bit here and a job

there. It all adds up to keeping me comfortable." Jeff sipped his cocktail and nodded in appreciation. "And you?"

"I've been a bit busy, too," he said. "Frankly, I'm about to make an idiot out of myself."

"How come?"

"Well, I'm about to take back all the things I once said about Lucille."

"Oh?"

"I've seen her practically every night since we met her at the Saddle Club."

"That's about a week."

"Somewhat less. But it doesn't take a century to tell when you've made a mistake."

"That's true."

"Anyway," said Horne, toppling some cigar ash on a convenient ash tray, "Whatever Lucille Roman may be around the conference table she is warm and affectionate when she leaves the office."

"Well good for you." Jeff nodded slowly. "Doesn't carry a grudge, then."

"Not at all. So that takes care of my time," said Horne with a chuckle. "Unless, of course, you want a blow-by-blow detail of my evenings."

"That's asking a lot." Jeff grinned.

"Okay. So that takes care of me. I'd have been around to see you but, Jeff, you're nowhere as interesting to be with as Lucille. But what about you?"

"As I said—"

"I know now. What about that job you scurried off on?"

Jeff shrugged. He didn't remember mentioning it specifically but he must have intimated something of the sort. On any count it was strictly old hat now and he did not go into detail.

"It didn't materialize."

"How come?"

"Couldn't come to terms." That was true enough though the terms stated were not Jeff's.

"Too bad. Well, that's life."

Jeff shrugged noncommittally. "I didn't mind too much," he told Horne. "It would have taken too much time from my own projects."

HORNE considered this. If what Jeff said were the case there was little point in keeping the young instrument maker under his eye. He could afford to keep Jeff as a friend. The man was obviously a friend of Lucille Roman and Horne's former inten-

tion of getting into the inside of the Roman Enterprises was nullified by his interest in the woman herself.

He had the inside track now and he forgave Jeff his game of upsetting the Horne apple cart at the auction. In fact, had it not been for Jeff Benson, neither of them would be sipping excellent Martinis in Lucille Roman's apartment now.

At any rate he was not going to ask leading questions that might be turned against him at a later date. Horne no longer needed the technician as a wedge into the business or graces of Lucille Roman.

He nodded over Jeff's shoulder at Lucille, who was talking animatedly to an elderly man. "Let's rescue the lovely lady from Santa Claus," he laughed.

"Or," grinned Jeff, "make the guy grow some hair to go with those thick glasses."

Jeff and Horne were about to walk across the room with this in mind when the doorbell rang. A man came in and peered through the room until he found Charles Horne. Then he came straight across the living room floor.

"May I see you alone?" he said in a quiet voice.

"This is a party." Horne smiled. "Meet Mister Benson—Frank Hamilton, my brother."

"How do you do?" said Jeff politely.

"Charmed. But Mister Horne—"

Horne shrugged. Nothing bothered him. He expected nothing. Furthermore, he was self-confident enough to think that no matter what was said it would be good. If Jeff Benson were a friend of Lucille Roman he would doubtless carry any tale of Horne's ability as a manipulator to the woman, thus creating a more desirable legend about himself.

"Mr. Benson is a friend of mine. Unless this is vitally secret go right ahead. He'll take no advantage of me."

"Well, I thought you'd better know. Things have been a bit rough."

"How rough?"

"Quite rough. But I managed to get you out of it with only a hundred thousand loss."

"Good Lord! What happened?"

"They got you in a cleft stick while you were—unavailable. They seesawed the Horne Non-Ferrous Metal holdings around until I had to sell you out before they took your shirt."

"How does it stand right now?"

"If you can raise a hundred thousand by Monday morning at market opening I can get it back and another hundred on top of it. That's all it takes."

"I can't sit down and write you a check for that," said Horne thoughtfully. "It would take time. Dammit, I don't want to let that aluminum holding go. A hundred grand is a lot of dough and the holding is worth more than that by far."

"That's why I've been trying to find you for a week—especially the last day or so. A bit of bolstering would have set you up for fair."

Horne nodded. "Come on," he said. "I think I know where I can get squared off."

Leading the other two Horne went across the floor towards Lucille Roman. As they came up Lucille turned with a bright smile. "Meet Doctor Phelps," she said.

The doctor looked at them through thick glasses. "I've heard of Mister Benson but never have had the pleasure of meeting him before."

"Doctor Phelps is the head of my latest project," said Lucille. "He came here to-night to tell me that we're about ready for the final touches."

"I've been testing the essentials for a week now and it's successful."

"We'll be needing a few thousand square feet of one-inch aluminum plate," said Lucille. "And then—"

"Now that's interesting, Lucille. I have quite a stock of one-inch plates in the inventory at Horne Non-Ferrous Metals. Could we make a deal?"

"What kind of deal?" asked Lucille archly.

"Why, I need a quick hundred thousand to cinch a deal. Make it at four percent and I'll furnish you with all the plate you need at ten percent under the marker statement."

LUCILLE laughed. "We have plenty of plate," she said.

Her attitude was one of complete poise. She acted as though what she knew of Horne's little deal was only what he had mentioned in the past minute. But a tension came into the air, a quiet tension that was almost undefinable until Jeff Benson suddenly realized that, during the past minute, the guests in Lucille's apartment had been diminishing their small-talk gradually. Now all were silent so that every word said was being carried to every ear.

"Then how about the hundred? Can we do business on that?"

Lucille laughed again and it was a sharp laugh.

"You chiseler!" she snapped at him—though delivered in her pleasant contralto it was none the less a snap. "I should have cleaned you out. But the hundred grand you're losing is the amount you would have gypped me out of at the auction."

"I—you—gypped!" gasped Horne, comprehension coming very slowly. "You've been playing games?"

"I never play games!"

"But I—"

Lucille laughed again. "Get out, sucker. And next time remember—if you want to play games a man's way I can play a woman's game against you!"

"Why, blast you!" Horne started forward and Jeff stepped in to intercept him.

Lucille saw the move and turned upon Jeff. "Don't clip him again, Benson," she snapped. "Don't waste energy. That game won't work twice."

"What game?" said Jeff with a blink.

"That was a fine melodrama you two made at the auction. You think I've not been watching you both? What did you hope to do? Get my business from specifications?" She whirled on Phelps. "And the one who recommended Jeff Benson for instruments had better watch out, too. He may be in it!"

"Just what are you driving at?" demanded Benson.

Lucille Roman turned on Jeff again. "Do you think I'm stupid?" she snarled. "Think I don't know?"

"Know what?"

"Oh bah! For one thing, showing me around that firetrap you call a laboratory. Boilers and gas burners and fancy gauges! You think I don't know a laboratory when I see one?" Lucille turned to her guests. "Meet Jeff Benson and Charles Horne. They thought they could bamboozle a woman. Now that they've been clipped back they're crawling!"

There was a general laugh.

"Get out!" snapped Lucille.

Jeff looked at her. He did not know her very well. He had, of course, been attracted to the woman because it was impossible for a man to have blood in his veins without having it run a little faster at sight of Lucille Roman.

His own blood had quickened when he

realized that Lucille Roman was human enough to enjoy being wined, dined and kissed by Charles Horne. It gave the financially brilliant and physically desirable woman a less goddesslike quality. It meant that she was at least as much woman as financial wizard and made her less unattainable.

But the idea that she could and would use her physical charm thus to further her own interests made Jeff a bit sick.

What she had against him he could not know. Apparently she went on the theory that anybody found with her enemy was also her enemy by induction. It was both unreasonable and illogical and heaven protect him from a woman like that.

"Drop dead!" he snapped at Lucille. "I'll bet you never had an honest emotion in your life."

Seething with the injustice of it Jeff Benson turned his back upon her and went to the door. Horne followed him and the scornful laughter of Lucille's guests—who had come prepared to witness their downfall—pursued both of them down the hallway after the door was closed.

CHAPTER VIII

Solar Instability

AND that," said Charles Horne bitterly, "is Lucille Roman at her best."

"It didn't seem necessary," complained Jeff. One part of Jeff's mind kept telling him that to be scorned by a group of people who were gathered there for no other reason was not too important. No man lives who has no enemies. But the larger portion of Jeff's mind resented the scorn deeply.

It is difficult to ignore the scorn of the lowliest of mental and physical inferiors, let alone people who might be one's equal in one line or another. The fact that Lucille's vicious tongue-lashing had been entirely uncalled-for, her suspicions without ground save self-induced circumstantial evidence and her methods more vindictive than merely combative rankled the young instrument maker.

Meeting a rival face to face or besting him in open competition was one thing. But it offended Jeff's code of ethics that she had called in a group of friends to join in catcalls

and scorn in what was almost a public condemnation.

"That's Lucille," repeated Horne. "If I'd known what she was doing I'd have strangled her soft white throat instead of caressing it. And she played the same game on you?"

"Just about."

"Hah. I thought it was a genuine friendship."

"Me too."

"Now you begin to see what goes on with Roman?"

Jeff nodded. It was inexplicable to him. He had not been plotting against her, he had not been competing with her. He had offered her only good and for that he had received a tongue-lashing and accusations that had little basis in fact.

"Look, Benson, I'm going to clip that dame."

Jeff nodded.

"Want in?"

Jeff spread his hands. "I'd like to make her eat every word—backwards," he said. "But I'm afraid that the kind of weight I carry will do little towards slowing her down. We run in entirely different orbits."

"You must be able to do something," mused Horne.

"Darned if I know what. I'd as soon forget it. It seems that my initial venture into the upper bracket was unfortunate. Maybe I'd best continue to operate in my own sphere."

"But that's not too self-satisfying in the face of what happened up there," said Horne.

"Perhaps," said Jeff.

"How—for Pete's sake?"

Jeff smiled wanly. "I'm not much in favor of the still small voice crying out in the wilderness," he said slowly. "Any voice carries farther when it has some weight to back it up. Give me a few more months of success in my own work and I may reach the point where I can command my own following."

"That seems like the long way around," objected Horne.

"Getting to be a big frog in mine own puddle is the only way I'll ever get big enough to make reply."

"I'd like to help," offered Horne quietly. "Or would you prefer not? It just occurred to me that you might resent me."

"Why?"

"Well, Roman obviously hates my shoes.

So hard, in fact, that she has you tarred with the same hate. You'd not have received her measure of scorn if you and I had not been chummy."

Benson shrugged and laughed easily. "I'm not so small a man as to drop a friendship because someone puts me in the same bracket as my friends. Maybe I *am* in the same bracket. Birds of a feather, you know."

"Well, if you think of anything let me know—and if I think of anything I'll get in touch with you. If you want help, that too."

"I'm okay," said Jeff. "For me, the only thing handy would be forty hours in a day and nine days in a week."

"That I can do nothing about." Horne smiled. Jeff nodded, shook Horne's hand and left the financier to go home to his laboratory.

Jeff Benson knew that the one thing that he could stop his gnawing anger at Lucille's injustice would be hard work that showed promise. A bit of an introvert, Jeff could take solace in his own personal successes.

A FEW days after the deplorable incident in Lucille Roman's apartment, Jeff Benson opened his laboratory door to admit Professor Lasson.

Jeff blinked cheerfully and drew his old professor inside.

"Doc! Am I glad to see you!"

"You're looking well, Jeff. Keeping busy?"

"A bit here and a hunk there. Enough to keep me out of mischief, anyway."

Lasson snorted cheerfully. "You *must* be busy," he observed. "As long as I've known you you were never too busy to get into some sort of mischief."

Jeff shrugged and nodded.

"Good looker?"

"Perfect thirty-six—including the I. Q. Great luminous blue eyes and small dark mind."

"Keeps you busy?"

"She did. No more."

"Good. Then you'll have time to put your mind on another kind of problem."

"For you? Gladly. What's up? Is the sun getting out of hand?"

"You've noticed?" asked Professor Lasson, his eyes widening.

"Noticed? Noticed what?"

"That Sol seems unstable."

"Sol unstable?" Jeff gulped.

"If you've noticed that helps. We have a

piece of very minor evidence that may indicate instability. We want confirmation and if you've noticed it too—"

Jeff shook his head solemnly. "No," he said quietly. "My remark was just a pleasantry."

"It's far from pleasant."

"Well, what goes on for heaven's sake?"

Professor Lasson explained the observed irregularity in the solar energy output and then hastened to explain that their ideas were, of course, quite primitive at this point.

"Such a thing has never been observed before," nodded Jeff.

"Perhaps because nobody looked for it before. It may be quite all right. On the other hand the first sign of instability might lead to a stellar blowup."

"Nova!"

Lasson smiled tolerantly. "How quickly we all leap to the same conclusion. Not necessarily nova, Jeff. No one really knows what causes a nova. There are a lot of fine theories but all of them lack proof and all of them contain holes large enough to run a galaxy through."

"But this is—"

Lasson smiled again. "How insecure we are in our hearts. At the first sign of an irregularity in something we have come to believe unchanging we grow panicky. Our evidence is so slight that we shouldn't postulate anything. That's where you come in, Jeff. We want you to build us a few instruments to measure solar constants and record them."

"Okay. What will you need?"

"Can we devise an energy-collector to measure radiated energy to a square meter?"

"It will have to be coupled and correlated to the varying density factors that cause irregularities in the solar energy collected on any given square meter of area. That might be difficult."

"We're atop a tall mountain," said Lasson. "It would not be too much like city living, you know."

"But even so the atmospheric conditions change from day to day and hour to hour as temperature and humidity shift. The dust-count changes and—well, there's one way we might be able to eliminate those atmospheric factors.

"Since terra's atmosphere would be common to all kinds of received energy we could balance the intake from some nearby bright star against Sol. Then if the local condi-

tions cause a lowering on solar intake it would also lower the stellar intake by a like amount. The two should shift together if no irregularity exists in Sol."

"Unfortunately, I doubt that we could correlate Sol observed at noon and a bright star observed at midnight."

"Um—there's that. But we're still on the right track. Suppose we set up a standardized searchlight on some mountaintop a good distance from your observatory. Then we could observe the atmospheric light absorption in the passage of the beam and make allowances."

"That wouldn't be perfect but it would be better than nothing. Now we'll want some sort of device that will measure the index of gravitational refraction of light due to mass."

"Will Sol's mass be shifting?"

"I doubt that. But the warpage of space due to stellar mass is accepted as a factor, you know. And the energy level of Sol might cause a shift in this index if the energy level changed."

"I don't follow that at all."

"Well, one of the theories of the cause of a nova is the fact that space itself becomes warped, due to too much mass concentrated in one place, and buckles in upon itself," said Lasson.

"Remember, Chandrasekhar points out that a cold mass cannot be larger than the planet Jupiter. When it becomes more massive it causes internal crushing of the atoms at the core and becomes smaller."

JEFF nodded. "I recall Chandrasekhar's curves," he said. "A cold celestial body of half a million times the mass of the earth would have a theoretical diameter of zero. But Sol is not a cold celestial body. Sol is a mass of incandescent gas."

"But of such a mass that the internal atoms are still crushed. This internal crushing increases as the diameter of Sol decreases and may come to a point where the spacial buckling causes a blow-up."

Jeff nodded and then grew solemn.

"I have another theory about it," he said seriously.

"You have? What is it?"

Jeff went to his desk and handed the professor a few sheets of paper. "These curves," he explained, "show a general plan or pattern that indicates a flaw in the law of conservation of energy. I hope someday to show that every time energy is converted from one

medium to another a small percentage is lost."

"I recall some small talk about your theory, but you've never been very thorough in your letters to me. What has this to do with stellar nova?"

Jeff shrugged. "If my theory is true, then the question is—where does this energy go? Is it stored in some subspace awaiting its chance to break through and return?"

"Could be. But it sounds pretty much like a made-up theory to explain the moment. Can't you refine your measurements somewhat?"

Jeff shook his head sadly. "I've been trying. I've done the best I could so far."

"Maybe we can see the proof of your theory in Sol's misbehavior."

Jeff stood up. "We'll get to work," he said. "Maybe you're right. At any rate a minute percentage of four million mass-tons of energy per second ought to be big enough to see. The inconsistency found in converting a few thousand gallons of butane to heat is too small to be measured accurately."

Lasson took off his jacket and rolled up his sleeves. He would help Jeff finish the first of the measuring devices and take it back to California with him so that he could get back to his own work. Jeff could then finish the rest of the equipment and send it on as it was done.

* * * * *

Lucille Roman lounged in a metal easy chair bolted to the deck and smiled vivaciously at General Walters. "We could easily take this to the moon," she suggested.

"Not this trip," objected General Walters. "I'm not prepared to do more than view its operation and make an estimate of its efficiency. I'm convinced. But we'll make no formal interplanetary voyages in this rocket. Not until we spend quite a bit of time in research." Walters turned to Doctor Phelps. "Just what is the propelling medium?"

"It is a jet of atomic particles."

"And how does it function?"

Phelps winced almost imperceptibly. This was the part that was so very weak in their arguments. Phelps, a physicist of ability, did not enjoy the idea of plunging forth and using something of which he had so little knowledge. Furthermore he felt that, as designer or discoverer of the atomic jet, he should know more about it.

He swallowed hard and said, "About a year ago I was doing some research on the problem of devising a neutrino detector. Such has never been accomplished, you know."

"So I've heard."

"Well, my first attempt was to take a radioisotope known to emit neutrinos, positrons and electrons. Neutrinos have no electrical charge and so, to eliminate the positrons and electrons from the radiation, I set up counter-reacting electro-static and electromagnetic fields. I'd hoped to make a trap for these particles while hoping equally to observe some sort of bombardment on a fluorescent screen."

Doctor Phelps talked on, evading the general's question and praying that, by holding the floor for some time, he could cause the general to forget that nothing had been said about the source of power.

"I believed that while the fluorescent screen favors electron or positron bombardment it would be sensitive enough to indicate a minute amount of scintillation from neutrino bombardment. Neutrinos have neither charge nor much mass but they do have energy, you know, and should cause something.

"Anyway," continued Phelps, "I found that the counter-reacting electrostatic and electromagnetic fields did not do away with the positrons and electrons by trapping them and turning them aside. Instead a needle of energy came from the delivery tube that nearly blinded me.

"It burned a hole through the fluorescent screen, melted the objective lens of a photomicrography setup and generally raised hob with the equipment. Further refinement gave us the atomic jet which we're now rocketing through space on just above the superstratosphere."

"Interesting," nodded General Walters.

PHELPS took a deep breath and Lucille Roman smiled enticingly at the general. The general forgot about the source of energy and accepted a cigarette from her. Her fingers were cool as they lingered against his.

Miles below them was earth and, as General Walters nodded agreement, it shifted position in the viewpoint as the ship changed course.

"I can see that making the moon would be easy," observed General Walters. "This rocket handles very well."

"That is because we have a reserve of power," said Doctor Phelps. Lucille jabbed at his ankle with the sharp corner of a very high heel.

"You seem to have," said the general, whose attention had been diverted from the woman's charms.

"We have a total of eight jets on the spacecraft," explained Phelps proudly. "I have checked them and found that four of them would take us off of Terra without much struggle. I believe that three of them would work but, unfortunately for any such test, we would have to rearrange the position of the jets. It would require a bit more tricky handling to drive straight with an asymmetrical pattern of force behind us."

"That I can well believe. Also," said General Walters, "we'd like to know some more about the source of your power."

Lucille Roman laughed vivaciously but cast a cold glance at Phelps for not having enough sense to keep his mouth shut. "Frankly, General Walters, we've been so busy developing the Roman Jet to its present degree of power and efficiency that we have had too little time for pure research."

Phelps nodded. "I hold that this power is a fundamental principle of the universe in which we live. Like electricity, we who first discovered it know little about it. Time will bring forth full knowledge. But in the meantime we can handle it, use it, direct it and control it perfectly."

"It sounds a little risky but you seem to have it under control."

Phelps nodded happily. Lucille took a softer breath as the sore spot was crossed without trouble.

Phelps then added, "I've had a pilot model running for more than a year without observing the slightest instability. The pilot model was recorded in every phase for that time and was periodically manipulated either by myself or by random-selecting synchro-motors. This has all been recorded. These records, of course, are yours for the asking, General. They will show the Roman Jet entirely reliable."

"This is still a top-top secret thing. As soon as I am able I shall get an appropriation for a research program to study this from a theoretical angle. Incidentally, it looks like a huge success, Miss Roman."

"Thank you."

"I suggest that you double your guards. I'd not like this to get out at all."

"Every man in my laboratory is cleared for top-secret work. And every man there is utterly loyal to me."

"Good. Keep them so."

Then the earth turned again below the spaceport and the spacecraft streaked for the ground, three hundred miles below.

CHAPTER IX

The Story Breaks

CHARLES HORNE came into Jeff Benson's laboratory with a newspaper and a glum smile. Jeff was surrounded by a maze of equipment of all sorts, including a number of packing cases filled with spare parts.

"Quite a mess, Jeff."

Jeff nodded. "Rush job."

"Golly! Do scientists have rush jobs?"

"Uh-huh," grinned Jeff. "Sol can sit up there and burn for two thousand million years without anybody getting more than mildly interested in him. Then someone notices a trace of a bit of evidence to the effect that there might possibly be a change in the ionizing potential of the photosphere.

"Instantly every man who has ever heard of the photosphere must drop whatever he'd been doing and measure it to seventeen decimals within the next three weeks. Let's see, three weeks is what percentage of two thousand million years?"

"Bad as that, huh?"

"Not quite."

"Too busy to take a look at something?"

"Not quite. What have you got?"

Horne slapped the newspaper on the desk in a clean spot and spread it open to the front page.

ROMAN SPACECRAFT SUCCESSFUL!

Today the Roman Enterprises announced achievement of man's highest goal. One week ago the Roman Spacecraft took off from a secret laboratory in the Middle West and proceeded along a precalculated course to the moon, where the spacecraft landed first on the earthward side, then moved to the far side of the moon long enough to take a series of pictures of this spectacle never before seen by man.

Today, at five o'clock EST, the Roman Spacecraft returned to earth and made a suc-

cessful landing.

Officials of the company and a member of the government claim that the first interplanetary trip was made without incident.

The success of the Roman Spacecraft is due to the development of a new type of rocket jet, the details of which are a government secret. It is probably atomic in nature, though many specialists claim that fissionable materials are not suited for rocket-type power. That is . . .

Jeff looked away from the article and flipped a page. There were pictures, a running account of the trip from the log of the ship and a few comments by Lucille Roman, who had gone along on the trip and was hailed as the first person ever to achieve such a feat.

The fact that there were five others, all men, in the spacecraft with her seemed to have been ignored by the newsmen. Of course, the Roman figure made better picture material than those of the crew.

Jeff looked at Horne.

Horne shrugged. "That ship is made of aluminum from the holdings I once owned," he said bitterly.

"So that's what she wanted the Hotchkiss Lab for."

"Sure."

"Well, now we know a lot more than we did."

"A bit," nodded Horne with a laugh. He took a picture from his pocket. "Look."

"Where did you get this?"

"I was there when the ship took off. This is a photograph of it in action.

"How did you get it?"

"By keeping an eye to the ground. I've been seething quietly ever since La Roman clipped the pair of us. Frankly I'd like to get even."

"Don't blame you." Jeff scowled, looking at the photograph.

"Not too illuminating, is it?"

Jeff shook his head. "Couldn't tell a thing about it. Not even the size. Nothing to compare it with."

"That's a shame. But I thought you'd like to see it. There's no picture of the thing in the paper."

"There's one thing about it," said Jeff after some thought. "You can calculate the size of jet necessary to drive a spacecraft of such and such a tonnage. Most of them come out with impossible figures, like one that came out with a jet throat almost four times the size of the base of the ship. I'll make a shrewd guess that it is not a

chemical rocket."

"That's something. If it isn't chemical, then what is it?"

"I wouldn't know."

"Atomic?"

"I doubt it. People who postulate a nuclear pile don't really know what they're asking a spacecraft to carry in the way of shielding. This idea of fissionable materials used directly in a rocket is completely impossible as far as I know—at least as we know fissionable materials right now. They either lie inert or they go bang with enough force to take half of the county with them."

"How about something we don't know in the way of fissionable materials?"

"That would come out of Oak Ridge instead of the Roman outfit."

"Well, I intend to find out," said Horne. "And since you're busy now I'll go about my business. See you later."

"Okay," replied Jeff. Within a few minutes he was back at work on Lasson's equipment.

AS THE days wore on Sol's change became more evident. Lasson took to Jeff's instruments eagerly and made reports—sketchy, of course—and suggested other ideas that Jeff accepted and went to work on.

The solar energy level was not changed much. It still took the finest of instruments to detect the degree of instability. Little squiggles on a curve and tiny blurs on a spectrograph plate are hard things to base a theory upon and Lasson wanted proof.

The summer wore on and September came with only one incident.

The Lake Bluff solar observatory sent Jeff a request for a device which would enable them to measure the polarity and intensity of the magnetic fields generated by sunspots. Jeff built them the instrument and sent it along with a suggestion that if they had noted anything rare about the solar behaviour they might contact Professor Lasson.

A week and a half later Jeff got a letter from Professor Lasson to the effect that they had got in touch with him at Jeff's suggestion and that now there were two laboratories aware that something was wrong with the sun.

In October one more laboratory had called upon Jeff for another kind of precision observing instrument and one labora-

tory had contacted Lasson directly.

In November Professor Lasson sent a carefully-worded letter to most of the solar laboratories in the world, requesting that they observe Sol for instability and suggesting that silence be their keynote lest a public panic be loosed.

By December most of them had answered and indicated they were puzzled but aware of the subtle change.

In December, early, Jeff left Chicago to take on a job in California, where a mining company wanted some equipment made to assay an ore sample for metals. They kept Jeff dancing from one mining site to another for almost three weeks and he had no permanent address during that time. When he had finished it he felt that he was far behind in regard to Professor Lasson. So, since he was in California, he went to see Lasson personally.

As he drove up the mountain he noted that he was being followed at a respectable distance by another car. He got out of the car at the observatory parking lot and waited for the other car to park beside him.

"Bit brisk up here, isn't it?" he asked.

"You bet. Connected here?"

"No, are you?"

"You're Jeff Benson, the precision instrument maker, aren't you?"

"Yes, and you?"

"I'm Jerry Woods of the *Chronicle*."

"Oh? Glad to see you. Something in the line of news up here?"

"I'm just beginning to smell it. Mind if I sniff harder?"

Jeff shrugged unhappily. Whatever Lasson had by now, no matter how certain, it was not the time for newspaper coverage.

"I'm going in to see Professor Lasson," said Woods.

"So am I."

Woods fell into step beside Jeff and together they went into Lasson's office. Once the greetings were over Jerry Woods came to the point.

"What's up?"

"Up? What makes you think there's anything up?"

WOODS smiled. "A newspaperman, I'm told by my admiring friends, has the mind of a detective. He operates on disconnected clues and ties them in together until he finds a connection. Unfortunately for eulogistic friends, both news-

papermen and detectives are just plain nosy and get their news and their criminals because they're being paid to go out and ask nosy questions of the right people."

"So?"

"I'll tabulate. One, a certain celebrated celestial observer in Cincinnati was observed taking his leisure with his wife in a Cincy bistro at two ack emma. It was a fine night out but Ye Celeb Obs had little interest in the stars. Fact of the matter is, he was seen to yawn at two ack emma—not accepted practise for a man used to staying up all night.

"Two, a group of alleged astronomers were seen having a fine meal at eight o'clock. This consisted of steak and potatoes instead of a nice breakfast of ham and eggs as might be expected of men who had just arisen to face the night's work.

"Three, there was a squib, a filler in the local newspaper, that the Eastman film company had recently filled an order for low-sensitivity film and plate for an observatory in Maine.

"Four, Jeff Benson, one of the country's best-known makers of precision instruments, has been deucedly busy for some time and in close touch with a well-known solar physicist.

"Five, I detect a note of dull black silence on the part of astrophysicists who usually have the politeness to tell me that they've discovered nothing of note since the expanding universe."

"So what does that add up to?"

"For a supposed sun-dodger the average astronomer is getting sunburned like mad."

"Nonsense. Periodically we take an interest in the sun."

"Uh-huh. So now we come to Number Six. Libraries and bookshops disclose a dearth of textbooks on solar matters. I assume that an observatory containing only a telescope for stellar looking might not be the best place in the world to find the latest textbooks on solar facts. And when Lake Geneva's Yerkes outfit starts to build a colostat on a tower as if they had to get it up in nothing flat, there's something up."

Lasson smiled. "Frankly, we've located a slight shift in the ionization potential of the solar photosphere. That's all. It's interesting. Everybody wants to get into the act."

Jerry Woods smiled serenely.

"The general public impression of a news-

paper reporter is that he must be bold, smoke cigarettes incessantly, type with two fingers, drink like an eel and have no schooling beyond the third grade. He also uses 'ain't' in his speech but not in his reporting because he was a rewrite man who once studied grammar.

"About the only thing that's right about me, apparently is that I'm given to wordiness. Because, gentlemen, I went through M. I. T. and decided to use what I had learned by being a roving science reporter for Associated News. So we have a change in the ionization potential of the photosphere. Very interesting. That's the symptom, isn't it? The cause is a change in the solar energy level, isn't it?"

"It could be."

"Maybe someone is shoveling coal into Sol," grunted Woods sarcastically.

"Why not wait until we're sure of ourselves?"

"You mean you're not?"

"Of course not. It's hardly begun to change."

Jerry Woods shook his head. "Fellows, I'd like one scoop before we all go up in a nova."

"Nova! Who said anything about a nova?"

"I did. Isn't that what stellar instability ultimately means?"

"Not necessarily. There are variable stars, you know."

"I know. But there isn't a variable star in the group known as the Main Sequence. There isn't an instable star there either. None but Sol and Sol is right in the middle of the Main Sequence!"

"We can't predict a nova. We don't know what causes a nova."

"Instability."

"We don't know what causes instability."

Jerry Woods laughed. "I got out of school before neutrinos were a popular subject for discussion. Ergo I am not as hep to the idea as I might be and a certain still small voice tells me that I shall be courting the ubiquitous neutrino with curiosity and savior faire as soon as I leave here.

"However, I gress—if digress is the negative for a lost positive—and I'll make my point. I'm told haltingly that all atoms contain neutrinos because the silent, undetectable little imps are necessary to maintain stability in the nucleus.

"But neutrinos are spewed forth in all atomic reactions and, because they have

neither charge nor appreciable mass, they go whistling right through matter and on and on and on ad infinitum. Whither, I dinna ken.

"But Sol is a vast nuclear furnace and the necessary neutrinos have been hurled forth for a couple of thousand million years at the present sitting. This is a lot of time and neutrinos, friends.

"Now, dammit, I don't recall whether the neutrino lives in the nucleus to glue it together or to keep it from collapsing of its own dead weight. Mayhap it is that uncertain something that sees to it that the coulombic repulsion between protons is maintained at a value less than the nuclear-particle attraction—or it may be directly responsible for this attraction.

"But to close this after-dinner harangue, I've heard a theory that it was an unbalance in the neutrino-count that caused novas."

PROFESSOR LASSON was about to correct Woods by telling him the real theory but Jeff Benson interrupted. "Frankly," he said, "For some time I've had a theory that neutrinos do not exist."

"Despite Fermi?" chuckled Woods. "Fermi and radiophosphorus?"

"I've got statistical evidence that some discrepancy exists in the conservation of energy. This is in chemical and mechanical and electrical conversions of energy. The neutrino explains the discrepancy only in certain nuclear reactions and is not applicable to physical conversions."

"You've what?"

"I've discovered and am seeking quantitative proof that every time energy is transferred from one medium to another some of the energy is lost. A small percentage."

Woods whistled. "Tell me what kind of a place is this mythical place where the energy goes to?"

Jeff shrugged. "I've postulated a sub-space."

"And the mass-tons of energy converted by Sol must deposit its loss in this energy bank? Tell me, Benson, who makes the withdrawal—and when?"

"Suppose we postulate two side-by-side continuums. One is increasing in matter and energy as the other converts. This makes one build up while the other is running down. Then—vice versa. This may have happened at that unconceivable time, two thousand millions of years ago, when it is believed that our universe was started."

"Uh-huh." Jerry Woods nodded thoughtfully. "And more likely, if your subspace exists, it is a warped thing, brought into existence by this forcing of the lost-energy proportion into it. Then, when it can no longer stand the strain, it bursts. Then, gentlemen, we have a nova!"

"That's what I'd been considering," said Jeff.

"That's what I thought. And there is the basis for your instability."

"Could be."

"Well, gentlemen, I thank you for a good story."

It came to them with a sudden thrust. Jerry Woods was primarily a newspaper reporter. His glib talk in their own selected fields, his ability to follow them in every detail and at times to anticipate them, his lack of the appearance of the average conception of a newshawk—these had lulled the two scientists into talking too much.

"You can't print that," said Jeff.

[Turn page]

"It's news, isn't it?"

"It's an opinion only. Frankly, we're none too pleased with our results. We're only fairly sure that instability exists and we are most definitely not sure that some instability of this nature does not exist all the time.

"We're even less partially convinced that this may ever get to the point where it may be measureable without precision instruments, let alone rising to the proportions of a cosmic calamity."

At that moment Jerry Woods might have been convinced. He had seen a few calculations and a couple of curves on Professor Lasson's desk and he was scientist—and knew scientists—enough to know that when they have something certain to point to they seldom spend their time poring over the sort of minutiae that he saw represented on Lasson's desk.

He also knew that if you poke a scientist with an idea, valid or invalid, he is often inclined to postulate and hypothesize and dream on and on toward the imaginative theme of what might obtain if—if the entirely false premise were true.

Ask a scientist what would happen if silicon could take the place of carbon and you are more than likely to get in reply an entire plenum geared to the exigencies of silicon life-forms from amoeba to plant to animal including homo sapiens siliconis.

Jerry Woods was aware of the imaginative qualities of the scientific mind and might have accepted their explanation about solar instability and any possible nova as sheer imaginative fancy but Professor Lasson's ambitious and enthusiastic aide, Harry Welten, took that moment to come running in, almost breathless.

"Professor Lasson," he cried, "this is it! Harvard just confirmed us. They've had it on the electronic sigma curve extrapolator and predictor and the answer comes out *nova!*"

Jerry Woods nodded quietly. "It's been nice knowing you, gentlemen. If ESCEAP says nova I believe it."

"But—"

"I'm a newsman, remember? And now that Harvard has this on their mind it is only a matter of time before the world knows it anyway. Let me break it—and quick—before anybody else does!"

"But—" began Professor Lasson. Then he shook his head and smiled sourly. "Oh

well," he said. "If this is nova for Sol what difference does it make what we do?"

Jerry Woods nodded quietly and, instead of leaving the office, picked up Professor Lasson's telephone and dialed the number of the *Chronicle*.

CHAPTER X

Reaction

THE next few weeks were utterly chaotic. Nothing made sense and no one cared much whether it made sense or not. It is impossible to describe the feelings of the people in any but a general sense but there were definite trends that can be recounted. Any individual caught up in the maelstrom of outraged humanity exhibited the same feelings whether he was more violent or more conservative than the normal.

First came disbelief and scoffing. Men watched the traveling electric sign around the Times Building, which indicated tersely that, *Scientists Say Sol Is Entering Unstable Period*, against the screaming headlines of one of the Times' competitors which was more noted for its lurid pictures and sensational captions:

WORLD'S END

SAYS SUN!

The scoffing came partly because Sol had been shining quietly for as long as man could remember and many times that long before, no doubt, and partly because that same newspaper had cried wolf far too many times before.

But it was true, and disbelief could not cry down the cold-blooded statements made by scientists whose word carried weight. They all agreed, save a few who felt that it might gain them fame, fortune and publicity if the rest of the scientists were wrong. If they were right it would make little difference.

Then came apathy. Men went in to their bosses completely tired of their jobs. They went in to tell their bosses where they could put their jobs and discovered that their bosses were telling their supervisors where *they* could put *their* jobs.

Not a few men told their wives where they could go and as many told their wives where they could be found if needed. The reverse added to as high a figure. Jobs were left unfinished, money came from the banks, food came from the stores, business and finance came to a grinding halt.

Some sought solace in God. Some, who had no god, sought solace in whatever they revered or worshipped. Men whose lives had been their work scorned those who left their jobs—men who left their jobs spat upon the diehards who tried to work when nothing meant anything anymore.

And nothing really meant anything anymore. Man's life is spent in preparing for tomorrow. There is the eternal hope that tomorrow may be better, that beyond the next hill, over the following crest, there will be something finer. But when tomorrow will not come, why bother?

Why plan?

The Scriptures were quoted, and from them it was told that God intended to destroy the earth by fire because of its wickedness. People jammed the temples, imploring and praying for salvation.

Other people stood in groups, hushed and almost breathless, watching Sol through smoke-covered bits of glass. Hour upon hour they stood, waiting for the calamity to come.

Crime and viciousness were rife and from this streak of violence came the turn of the apathetic tide.

Men realized that while Sol might blow up at any time, tomorrow or next year. Exactly when was not too well determined for no one knew just yet the two salient facts of how swiftly the instability was rising and just what level of instability marked the critical point. But they realized that until it did snuff them all out in a grand cosmic explosion they had either to live or commit suicide.

Suicides were many but those who did not die by their own hands preferred to live to the last ditch, some to eke out the last savor of life and some because they feared and hated the oblivion of death.

So those who lived armed themselves and took vengeance against the unruly and the vicious.

Then, as the days wore into weeks and nothing seemed changed with Sol, men drifted away from their revelry and their indolence. One by one they went back to

their jobs, some because they were hungry and some because they were just bored with nothing to do. Some went back because only by hard work could they forget the impending doom that shone down out of the sky upon them.

Then came contempt.

A NOVA, said the scientists. So be it. But astrophysicists have been in the way of thinking in terms of a few million years at a clip, of measuring distances in light years, of talking about the fact that twenty-five thousand years ago Polaris was not the pole star.

A nova, said the scientists. So be it. But could they tell whether it was to happen during this lifetime or ten thousand years from now?

Sol had been shining for countless generations and no change had been seen in all that time.

Comedians made jokes of it and Hollywood continued to call them Stars or Starlets, depending upon their popularity—but the top-notch actors quickly became Novas.

Hollywood ignored the learned, who pointed out that a Nova was supposed to come up from the unnoticable stage, pass through a short period of brilliance far exceeding its neighbors and then die into obscurity to be seen no more. One studio ignored this to the point of heralding its gala production for the year a 'galaxy of Novas!'

Man had run the gamut from abject fear to superior scorn. The pendulum had swung. Then it turned back and people knew that the astrophysicists were right, that sooner or later they were doomed.

Dull-minded and fear-sodden, they went about their work with a gnawing fear. They did only that which they felt necessary and subtle humor was lost. Men either worked sullenly and doggedly or laughed played loudly and roughly in the hope of forgetting for a few minutes that certain doom hung over them.

The astronomers were busy men during those weeks. The curious and the fearful came to them and looked through their solar telescopes and went away unsatisfied because they could see nothing. The scientists answered millions of millions of questions and half of these were the simple answer that nothing could be done.

As people realized this the observatories

lost their charm and the scientists could once more pursue their observations and make their calculations without interruption. At the end of the first wave of panic there were but few questioners per day who bothered to come to them. Near the end of that phase, Professor Lasson saw through his window a large automobile being passed through the hastily-constructed gate and fence. The armed guard waved it through.

It was Lucille Roman.

"You are Professor Lasson?" she stated.

The elderly savant nodded, wondering.

"You are the man responsible for all this?"

Lasson smiled. "Not I," he stated.

"But you—"

"You'll have to go to a higher Authority than I," he told her. "I merely made the initial discovery."

"That's what I meant," she snapped.

Lasson eyed her. Forty years before he would have been favorably impressed, whatever her mode of speech or idea of politeness. At the present time she was a veritable youngster, possessed of a prodigious quantity and remarkable quality of pulchritude.

She was also one of the types of women who possessed so much in the way of material things, beauty and money, that she had never been forced to learn charm and politeness and humility.

He snorted. "That isn't what you said," he told her.

"You know what I meant."

"Lady, the last time I read a mind I was so shocked that I gave it up."

"I'm Lucille Roman."

"I'm—"

"Don't be impertinent. I know you."

"Impertinent?" he laughed. "My dear Miss Roman, you are the one who snapped at me. I've always considered it fitting and proper to introduce oneself before starting a discussion. Now let's forget that you have more millions of dollars than I have formal degrees and start off on an even basis. What can I do for you?"

"I want to know about this nova."

"You've read the papers?"

"Yes, but can you trust them?"

LASSON nodded. "Since a stellar blow-up can be construed in no political light, blamed on no particular race, breed, color, creed, religion or previous condition of servitude—and because most newspapers

lack the type of trained personnel to accept an account of this nature—they have no one to rewrite it into either gobbledegook or highly-flavored accusations. Most of the news accounts were as given out."

"Then we are to have a nova, and there is nothing we can do to stop it?"

"This is correct."

"When?"

"We're none too certain."

"Why?" asked the woman. "It seems to me that if you know how far this thing is going you should be able to tell about when it will get there."

"That is a sage idea. However we do not know yet just how the instability will progress. One school of thought claims that the instability, once started, will increase according to time. Lineally, that is. The other school claims that the instability will increase as the square of the time, somewhat similar to the fall of an object from a height. It goes faster as time progresses."

"But which—?"

Lasson held up a hand. "There is still a third school of thought that says, Sol is a solid and therefore any instability in the three-dimensional object will progress as the cube of the period of time. This has brought forth three widely divergent ideas as to the time-element."

"I can see that. But soon you will know?"

"I imagine that in a few weeks we can have the time-progress curves fairly complete."

"Then it is just a matter of one idea against the other," said Lucille thoughtfully.

"A few weeks at the least."

"A few weeks at the least. But remember, there is one other problem."

"Another problem?"

Lasson nodded. "Another complicated problem. You see, Miss Roman, if you treat Sol as a yardstick, for instance, with the instability creeping up it like liquid climbing a thermometer, you may have an idea of what we're up against."

"The instability may crawl up the stick so many inches per day. It may crawl up the stick at the rate of the squared series—one, two, four, eight, sixteen et cetera. Or it may crawl up at the cubed series—one, eight, twenty-seven, sixty-four, et cetera."

"But the other problem is that we don't know whether the nova will come when half of Sol is instable, whether it may come at one-quarter or when Sol is three-quarters

instable. One factor is multiplied by the other and the trouble is that, when we do get the first factor nailed down, we will still never know until it happens just at what percentum of instability the star becomes a nova. By then it will do little good."

"I see. Then we may have some time yet?"

Lasson nodded. "Frankly, it might be years."

Lucille Roman thought for a moment. "I've heard it said and I've seen proof that time and money can accomplish anything. What can we do?"

Lasson looked at Lucille Roman and shook his head. "Do as I have done. Compose yourself and reconcile yourself to death."

"But I don't want to die."

"That's tough."

"But something can be done."

"Miss Roman, look at this projection on the solar wall. That is an image of Sol. It is one hundred times the diameter of the earth, one million times the volume of the earth. If the earth were dropped into the sun, I doubt that it would make more than a mild splash or a minor sun spot. Can you move the earth?"

"No, I—"

"Remember, moving the earth would do no good. You must do far more than move the earth."

"But something—"

"How can you get at it? You would fry in your spacecraft before you get within twenty million miles of it."

"But given time and money to discover something—"

"Woman, you can't buy the galaxy!"

"But I can buy brains and put them to work!"

PROFESSOR LASSON turned around. He waved his hand broadly. "Miss Roman," he said, "this laboratory and all of its fittings cost less than ten million dollars. I believe that this is somewhat less than a quarter of what your holdings are worth.

"If at some time a decade ago a couple of dozen of your friends had handed over a slice of their money for pure research we might know what could be done—if anything. Maybe it would have been better fifty years ago. Your father, for instance, might have done something about it."

"What?"

"Heaven alone knows what," snorted Professor Lasson. "We know so very little!"

"But I've expended sums of money for science."

"Science thanks you," replied Lasson sardonically. "And has thanked you in your own way. For every dollar you expended in the favor of science you have received a comfortable return, haven't you?"

"Not always."

"Look, Miss Roman, I happen to know that every dollar you have spent for your so-called science you spent towards some definite end. Did you, at any time, offer to endow Jeff Benson? He is a worker in pure research and this—"

"Benson?" snapped Lucille angrily. "He is a conniving cheat!"

"*He is not!* I knew Jeff Benson when you were wheedling your father for fifty-dollar playthings. While you were blowing bubbles with a platinum bubble pipe, Jeff Benson was studying the Newton's Rings the soap film made.

"He is in cahoots with Charles Horne."

"Oh blast you and Charles Horne!"

"Benson is sly and—"

"Sly? Just because he wasn't particularly interested in your type of cocktail crowd you grant him the faculty of being sly—because you think that Jeff's disinterest is slyness."

"I—"

Lasson shook his head in contempt. "He's probably wondering why you kicked him. That's how sly he is. But if you want to aid science at this very late date—now that your precious hide has been threatened by something too big to buy off—I suggest that you go to Jeff Benson and make him an offer to do something."

"I'd rather not," she replied scornfully.

"Then don't bother me," grunted Professor Lasson. "For if you endowed me the first thing I'd do is to hire Jeff Benson!"

"I'll die first."

"Could be," said Lasson quietly. "For me, well, I've lived a full life and I've not missed much. Kismet!"

"You wouldn't help!" blazed Lucille.

"Nope. There are too many fools like you," snapped Lasson. "Now get out with your money and let an old man study his charts in peace."

Lucille Roman left in a vicious temper. She seethed inside and vowed all sorts of vengeance—and then folded her arms in the

luxurious automobile that had brought her and cried, because all of her anger and threats of revenge were so utterly futile.

* * * * *

Just how many other savants Lucille Roman approached is not a matter of record but their answers must have been substantially the same, for three weeks after her rebuff by Professor Lasson, Lucille Roman quietly rang the doorbell of Jeff Benson's laboratory. She went in, brashly apologetic.

"I fear that I've treated you shabbily," she told him. "I've come to apologize."

"Anybody can make a mistake," he told her.

"I'm glad you feel that way. Now maybe we can work together."

"Work together?"

"I've been trying to get a group of scientists together to see what can be done about this. They all claim that you can't stop a nova once it's started."

"They're correct."

"But we have time and money. Research—"

Jeff looked at Lucille oddly. "It's a little late for that," he told her.

"I'll give anything."

"It isn't enough."

HER voice softened a bit. "I've been told here and there that you know as much about this as anybody."

"That's highly flattering but untrue. I am merely a mechanic. I work with my hands. What I know about the nova is no more than any other man."

"I'm not particularly talking about the nova now," she said.

"What then?"

"Jeff, can you make precision instruments for the navigation of deep space?"

"Easily."

"Jeff, we know there are planets around Procyon, don't we?"

"Morganson made that discovery a couple of years ago. But great heavens, woman, you don't—"

"Jeff, build them. We'll both go—together." Lucille leaned forward and put a hand on his. Her face was expectant. Her body was tense, vibrant. What she was suggesting had been in her conscious mind for some time and her subconscious mind now urged her glandular system into action.

"What an idea!"

Lucille stood up, her body still warm and trembling.

"We'll go," she said in a throaty voice, "to a new earth and star—"

"Not a chance," said Benson flatly. "We'd die on the way!"

The momentum of her idea was too fast to be stopped in one cold moment. She went on for a second, unheeding, and only after that time did she deflate a bit. The flat denial of the possibility caught her, chilled her and removed all hope. With the death of her idea her body went lax and a shudder passed through it.

Then, catching a ray of hope, she said, "But if we plan this right—"

Jeff shook his head, smiling at her lack of knowledge.

"In the first place we would be years and years on the way to Procyon—or even Alpha Centauri, for that matter. Alpha is about half the distance. There isn't enough space in your ship to store food enough for that kind of a trip and your ship isn't large enough to support a closed cycle of life.

"Fuel is another thing, though I don't know where your fuel comes from. I doubt that you have enough for a voyage requiring years—maybe fifty years, maybe more. Navigate deep space, yes. We could see our objective all the way and we could aim for it easily. But to try a trip of a lifetime's duration is impossible for physical factors alone."

"But we cannot stay here."

"If a start were feasible," said Jeff in a hard voice, "it would require the patience of Job and the love of Rebeckah for two people to spend their lives penned up in an aluminum tin-can with no sight of solid ground in sight.

"With you and me it would add up to murder most foul. Frankly, I'd rather be party to a cosmic catastrophe than take a life sentence with a female who wanted me only because I'm the guy who could keep her flawless hide intact."

"Why you—" This was a woman scorned reacting.

"Forget it, Lucille. You don't know what you're talking about."

Lucille Roman's body tensed again. The emotions that had gripped her before were gone, washed away in chill. Now anger came to add tonus to her muscles and she snapped around and darted towards the door. Every

click of her high heels against the floor told of her rage.

CHAPTER XI

Riot

JERRY WOODS called on Jeff late in September. The sun was blazing bright but according to the observatories the temperature actually was not above that of any of the milder Septembers that had marked the beginning of mild winters. It was psychology. Jerry Woods joined it by appearing in a jacket even though the thermometer claimed that it might be considered the beginning of topcoat weather.

"Still at work, Jeff?"

"Might as well. Might turn up something."

"What, for the love of Pete?"

"There's this subspace business. I'm still convinced of that."

"What'll that do?"

"If there are two universes side by side we might be able to find a nearby stellar system without an impending nova. On the other hand, maybe we might be able to cross deep space to another star in a short time."

"Just because we cannot exceed the speed of light in this universe does not mean it holds true for all universes. Maybe space-one matter is not subject to the laws of space-two matter. We might be able to go to the other end of the galaxy in nothing flat."

"Any results?"

"None. But it's a job to keep my mind off of the catastrophe. I keep telling myself that this fraction of energy must go somewhere. Where?"

"I'm the guy with the flair for words, Jeff. Let's call it the Fatal Fraction?"

"Call it anything. I'd rather it did not exist."

"You and a few billion other people. But look, Jeff, do you know anything about the Roman Jet?"

"Not a thing. Well, not exactly nothing, but practically nothing but guesswork."

"I've a press release here. About the Jet."

"Yours?"

"No. Unfortunately it's on the wires already and can't be killed."

"Bad?"

"It is claimed by a prominent man, speaking for a group of scientists, that the Roman Jet employs energy tapped from the sun in some manner known only to Doctor Phelps of the Roman Enterprises. It further hints that the Roman Spacecraft, which uses solar power, may have been the cause of the solar instability."

"Holy mackerel!"

"They go to great lengths to show that the Roman Jet was first discovered about the same time that it was believed the sun was unstable. They point out that the Roman Jet, in pilot model, was in operation for some time before Professor Lasson made his initial discovery but that the first influence of the Jet might have been so small as to make observation of Sol's initial upheaval impossible."

"Like the tiny hole in the dam they quote as analogue, one cannot be certain of it for some time by merely observing the level of the lake behind the dam. But once the hole in the dam has worn itself wide and the level of the lake begun to fall perceptibly, the damage has been done and the hole eroded to dangerous proportions."

"Unfortunately, they conclude, one cannot mend a hole in the sun's core as we might do with a crevasse in a dam."

Jeff shuddered and grabbed for the telephone. "Who?" asked Woods.

"Roman. There'll be a mob, and they'll kill her."

* * * * *

There was a mob and murder was what they intended. They boiled up the hill that held the Roman Laboratory and stopped at the tall electric fence. The armed guards fell back, closing the gate and throwing the switch. They called for Captain of the Guard O'Boise.

O'Boise came on the run. The thundering rumble of the mob was far too loud for a single voice, even that of O'Boise. He took to the microphone though he knew that the unaided voice of a man capable of shouting above the mob would do far more toward quelling them than the sight of a man gesticulating into a microphone while his voice came out like thunder from loudspeakers mounted on towers behind him.

"Halt!" he shouted.

The roar of the mob increased.

"Halt or we fire!"

"Go to hell!" screamed several in the

crowd. It caught on, and the entire mob began to chant the three words.

ONE bold man in a ragged shirt broke from the mob and crashed against the gates with a club. The sentry looked at O'Boise. O'Boise nodded and there was the flat crack of a rifle. The man screamed and fell, blood pouring from his thigh. The mob roared and surged forward. The rifles cracked four times more and from the nearby guard's shelter three more sentries came, carrying a machine-gun, which they mounted on the sidewalk that led from the gate to the front portal. They fired a brief burst above the heads of the mob. It slowed but did not stop the forward surge.

Then came a flash of fire from the mob and one guard dropped. Stones and clubs flew through the air and another guard was felled. His buddy ran forward and dodged the barrage of thrown missiles until he was standing beside the fallen one. Then from his hip pocket he took a grenade and hurled it over the wire fence. He stooped to pick up his fallen friend.

The grenade arched up, over, and down into the waiting hands of a man with a quick arm. He hurled it back and it burst above the fence, halfway between the guards and the mob. It spattered them with pellets and a cloud of gas erupted in midair. The gas drifted down slowly and made both guards and mob cough.

Another tear-gas grenade went hurtling over the fence to burst among the mob. This grenadier had held the bomb until it was about to explode and it was effective.

"Down and dig in!" yelled O'Boise.

A brief volley of shots rang out and chips flew from the sidewalk by the machine-gun.

"Fire!"

The machine-gun chattered and a half dozen of the mob dropped, howling. One guard fell, clutching his stomach, another stumbled, clipped on the kneecap by a thrown brickbat. The guard first downed by thrown missiles aimed and fired, dropping one mobster. The machine-gun chattered again and dropped another seven.

Then, from the mob, came spinning over the fence a length of hydraulic pipe about eighteen inches long and two inches in diameter. It was capped on both ends and from one pipe-cap there protruded a few inches of sputtering fuse.

The home-made bomb burst over the heads

of the machine-gun crew, spattered them with jagged shards of hydraulic pipe and stunned them with its blast. The smoke and noise covered more gunfire, which dropped another guard.

Then the crowd surged forward against the fence, and started climbing. Madmen they were, a hundred of them climbing the loose-mesh wire of the fence like monkeys. "Stop!" screamed O'Boise.

The first man that reached the top touched the charged wire and dropped back upon his fellows like a stone. Then there was an electric flash as one man at the top threw a length of chain over the charged wire and grounded it.

The mob surged up and over, the guns chattered and dropped them by ones and twos—but not enough of them. The machine-gun went into action as the foremost of the mob dropped to the ground inside of the fence.

Some of them headed for the gate.

"Stop them!" yelled O'Boise to the machine-gun operator. He grabbed his revolver and fired again and again at the rest of the insiders, who were charging the guards' position.

The machine-gunner dropped first one and then another, his misses going through the wire fence and into the mob.

Then the gate swung open and the mad mob surged in. They washed through the gate and across the lawn like the inexorable inward rush of a tidal flow. In they went, in and past the guards. In and past—and over—the guards and when they had passed they left them lying there.

O'Boise groaned once, lifted a feeble, fist, then fell back on his face.

The mob surged up to the building and broke in. They found Lucille Roman at the telephone with Doctor Phelps beside her.

Lucille saw them and dropped the phone. Phelps turned and held up his hands.

"We're not—" he started to say. They grabbed him, overpowered him, hurled him to the floor. More of them went for Lucille Roman. She fled through the door at the back of the office, slammed it and shoved a desk against it. She went through that office and up the fire-stairwell to the roof with the mob howling after her.

At the top Lucille toppled a metal cabinet full of fire-fighting equipment down the stairs. It carried the foremost of them back. Those behind the leaders hurled casualties

and cabinet alike over the center wall of the box-shaped staircase and continued on to the top.

PANTING with fear and excitement, Lucille Roman raced across the roof and leaped into the spacelock of the ship parked there. She struggled with the heavy door, hoping to move the servo-motor faster. The door closed slowly, ponderously, but not fast enough.

Hands appeared, and Lucille hit at them with her heels. They dropped and more came in to take their place. The door finally closed with a sickening crunch leaving the ends of several fingers on the floor inside.

Lucille retched and was sick there in the spacelock. She trembled in her aluminum spacecraft, frantic with fear and completely unnerved. Then she went up to the viewport. She heard the spatter of bullets against the hull. Some of them came through and ricocheted inside like angry hornets. Revolvers could not penetrate the skin of the ship but the heavier bullets from the rifles could—and did.

From the viewport she saw them haul Doctor Phelps out of the laboratory. He was still protesting weakly that the Roman Jet was not solar power.

They hung him from a limb of the tree in the front yard of the Roman Laboratories. Thus Doctor Phelps died believing that his jet did not tap the sun. It was unjust and anger came to Lucille Roman. She fired up the driving gear and the spacecraft rose from the roof.

The men on the roof died like flies under the backslash of that solar jet. Then Lucille Roman dropped the spacecraft into the yard and eight long lancets of sheer energy rayed down to sear the ground beneath the ship. She swept the ship in a spiraling circle and danced it up and down.

The eight jets left a swathe of black and flaming death however briefly they touched.

Sickened at what she saw, Lucille lifted the ship again and went up and up until the cabin whistled with the air screaming through the bullet holes in the hull. She was without plan, without hope.

She knew she must think this out. So, to give herself breathing time, she headed the ship towards the Rockies and landed it in a canyon where no man lived. There she could exist for a time while she planned her next moves.

"The yelling's died," said Jeff Benson in a strained dry voice. "The last I heard was Phelps crying that his jet did not tap the sun."

"How about Roman?"

"She left when they grabbed him, I gather. Hurlled the phone at them and scrambled." Jeff hung his phone up with a grimace.

"Must have been quite a scrap."

Jeff nodded. "I hope she got away."

Jerry Woods agreed. "But there's more to this news report."

"Isn't the damage done already?"

"There were some diagrams with the article; they came over the wirephoto. Maybe you can do something with them."

"They're none too clear."

"But they're good?"

"I don't know, Jerry. Maybe."

Woods scratched his head. "Does that jet tap the sun?"

"I wouldn't know from here."

"But if it did, could it have caused a nova?"

Jeff thought for a moment and then shook his head. "I doubt it," he said. "It's so confoundedly small compared to the sun. But I wouldn't know."

JERRY WOODS smiled confidently. "I've got to be going," he said. "I'll call you as soon as we learn whether Lucille got away from that mob. We'll know before anybody else. And as for the Jet, let me know as soon as you learn something?"

"What makes you think I'll learn anything from these drawings?"

Jerry Woods looked at Jeff and smiled. "You will," he said. "You will."

Jerry Woods was wrong on one count. It was Charles Horne and not he who brought the news of Lucille Roman's escape to Jeff Benson. Horne came late that night and handed Jeff Benson a newspaper which screamed in black headlines:

LUCILLE ROMAN WANTED FOR STARTING SOLAR MENACE

It went on to state that her act of using the Roman Jet had been responsible for the solar nova, according to prominent speakers, and that such an act had been declared one against the public weal, the national and international security and demanded that she surrender herself. A ten-thousand-dollar reward was offered.

"So she got away," said Jeff.

"Yes, dammit. Say, how did you know?"

"Jerry Woods told me about the first account and I knew that a mob would form and so—"

"Good thinking," interrupted Horne, not waiting for the details of the fight as Jeff had heard it through the telephone. "Too bad they didn't take her apart."

"I hardly agree with that."

"Huh?"

"I'd hate to think of Lucille Roman getting the treatment that wild mob was handing out."

"She deserved it. Every bit."

"No one deserves that."

"She did."

"Now look," said Jeff angrily, "no man deserves mob rule. No man, no matter how bad."

"Some people get away with so much murder for so long a time that the only way anyone can see justice done is to get a mob together and do it themselves."

"If competent authorities cannot see enough in the acts of anyone to call him criminal, certainly those without authority and possessed of less judgment in the matter can not so decree just because they think so."

"Lucille Roman started that nova—for which we will all fry. She ought to fry first."

"In the first place, a long time ago there was a rigid document written that positively declared against any kind of retroactive punishment," said Jeff pointedly. "If a man builds an obelisk on Tuesday when such is legal and laws are passed against obelisks on Friday, no one can condemn him and toss him into the Bastille."

"Even so, she started this and she should be punished."

Jeff shook his head. "I'm not too certain yet," he said. "But I have some plans and some notes and a few high-flung ideas about the Roman Jet. Horne, I'm almost convinced that the Roman Jet was an effect of the nova rather than the cause."

"You're working on it?"

"Remember, Horne—some time ago I stated that we could learn a lot about gravity if we could modulate it. Well, Doctor Phelps

was trying to develop a neutrino detector, I'm told, which led to the discovery of the Jet.

"I'm not entirely satisfied as to the necessity for the neutrino but what Phelps was looking for was the source of whatever-it-is that causes the flaw in the conservation of energy."

"So?"

"So, because Sol was already unstable, Phelps located a hitherto undiscovered effect. This he refined and improved until he developed the Roman Jet. He might never have discovered it had it not been for Sol's instability."

"A lot of premises there, Jeff."

Jeff nodded. "I stand on solid ground than Phelps. I have some plans and perhaps a better idea of what goes into this thing than he did. I'll be working with this Jet within the week."

"What do you hope to do but make it quicker?"

"Shucks, Horne, I'm convinced that the Roman Jet is the effect and the nova the cause. You can't tell me that a little jet like that could cause stellar trouble."

Horne shrugged. He pointed to the large star-map on the wall of the laboratory and said dramatically, "Perhaps the novas we see out in the sky from year to year are caused by strong-minded scientists who plunge ahead and develop their own ideas of the Roman Jet."

"Maybe, Horne. But I'll know in not too long a time. I'm not too certain right now that the Roman Jet does have anything to do with Sol. If I'm postulating like mad, certainly you are doing the same."

"Well, anyway, Roman needed to be clipped."

"Frankly, I'm sorry for Lucille Roman. At least I have my work, though it never be finished. I can keep busy and do less thinking."

"I can't. There isn't enough high finance nowadays to buy matches to burn the useless stocks I own. But this argument is getting us nowhere."

"I guess not," smiled Jeff. He turned to his bench and picked up a length of dural tubing. "Hold this for me, will you?"

"Sure thing," said Horne.

It was almost dawn by the time Horne left and Jeff Benson was well on the way towards building his first copy of the Roman Jet.

CHAPTER XII

Window Into Sub-Space

AS CHARLES HORNE left, he was thinking furiously. With billions of other earthbound people Horne did not want to die in even the finest of cosmic combustions. To die with pomp and ceremony and a monument that would attract the attention of every sentient being in the galaxy and other galaxies for thousands of millions of years was small compensation for the fact that he could not die very quietly of very old age.

Life was the survival of the fittest and man was certainly fit. Weakling that he was, man was master of his earthly environment because he had a brain. From the forests and the swamps he rose, gaining mastery over the material things in his environment where other animals—most of them stronger or more prolific than he—could not.

Man faced fire and stood his ground where other animals fled in terror or died because they did not recognize the grim destroyer. And eventually Man took fire into his cave and made it work for him.

Something could be done—something must be done. This much Horne knew, for with human egocentricity he believed himself to be the highest form of life, to be destined someday to rule not only Terra but the planets of Sol and eventually the Universe.

Man, physical weakling, was master of all: Strip a man of clothing, shelter, tools and means of communication. Drop him in a strange jungle, teeming with feral beast and poisonous snake, with plants and berries that cause cramp or death, and does he, like a lower animal, perish?

Perhaps. For there is that chance. But let him live an hour and he is armed with a club. Let him live a day and his club has a sharpened stone laced to its end, he has snares set to trap food; and a shelter.

Give him a week and he has the hide of one of the predators to clothe his naked hairless body and the flesh of the deadly animal to eat. And at the end of that week the animals of the jungle give him a wide berth, for man is a dangerous character.

Man, master of his earthly environment, became so because his earthly environment

threatened his life at every turn of the trail that leads upward from the slime and primordial ooze to the tall shining cities.

Now that man could change the face of the earth at his bidding the threat came from outside. Man must meet that threat, somehow, and overcome it.

Horne looked at the dawning day and shook his head.

One of the tenets of man's ability to control was his sensible readiness to flee when real danger threatened. It is not always necessary to stand and fight—it is even less necessary to stand and fight a losing battle. Sol was a threat that meant definitely a losing battle.

Therefore the thing to do was—by some means—to flee. To leave Sol before the nova and let the sun cast its awesome flare of bursting energy against a family of unpeopled planets. Second to that was the escape of enough people to make a new start.

Enough? That meant two at least.

Perhaps, if the nova had happened at an earlier day, the hope of escape would not have flared in every breast. But people knew of the Roman Spacecraft, and there was a faint flame of optimism in every mind, whether its owner had any chance of seeing the remarkable spaceship or not. Horne's conclusion was not unique. It echoed and re-echoed in the hearts of billions of people.

Only those initiated in the terrific extent of the interstellar reaches were without hope.

Yet Horne was not ignorant of the facts. He knew that the rocket seemed to have unlimited power. He had seen it take off on its maiden flight and, instead of hesitating and staggering, poised in that fearful moment when success or failure hung in the delicate balance of a fuel supply or a tank of oxygen—like the earlier White Sands experiment—the Roman Jet had taken the craft aloft with the effortless power of a diesel-electric locomotive drawing a single private car.

It had gone up swiftly and, as far as the eye could reach through deep-colored glasses, the jets had cut their glow in sharp relief even against a cloudless afternoon sky.

Sol, through the same glasses, was a dull red-purple disc. The jets had been blinding. Then, as they became less searing to the eye, Horne had taken the glasses off—swiftly, lest he lose the soaring trails.

He had cursed when they stuck to his ears because that took time and the rocket was rising swiftly. He had put his head down to

disentangle the bows from behind his ears and he felt that the rocket would be gone when he again looked up.

BUT in the sky, so high that the eight searing jets seemed to be but one tiny blinding spot, flew the rocket, its velocity still increasing in prodigious ratio.

Horne believed that the Roman Jet tapped Sol's internal nuclear power. If he were right, then that same power could be used in simple acceleration, hour after hour after hour, until the velocity of the spacecraft reached an appreciable portion of the velocity of light. And Alpha was only about four light years away. Eight years of soaring through interstellar space would not kill any man if he were determined to live!

All Horne needed now was to get his hands on Lucille Roman's spacecraft and then engage Jeff Benson to show him how it could be done.

Supplies? Horne had that problem figured out. The big problem was getting the spacecraft from a woman who hated his insides.

But Lucille Roman was keeping very well hidden. Wanted for tampering with the sun, clamored for by outraged people as a murderess for causing the deaths of the men in the mob which had ruined her laboratory and executed her chief scientist, Lucille Roman was not likely to appear in any place where she could be contacted.

Nor was she likely to be at any of her other plants, nor at her country homes, for when the mob killed Doctor Phelps and ruined the Roman Laboratory, other mobs had broken into her other plants and laid waste to them. Her apartment was a chaotic mess and her country homes had all been burned to the ground while the mob stood by to keep the flames from setting fire to the forests around them.

But if Jeff Benson said he had good reason to think the Roman Jet was not responsible for the nova, Jeff Benson was probably right. Jeff was one of those rare people who are often maddening because, 'It might possibly be,' meant it had at least a fifty-fifty chance, and, 'fifty-fifty' meant almost a dead certainty.

So the thing to do was to watch Jeff and wait until the scientist proved his point. Then to nudge the authorities into visiting Jeff, who would make them listen before they took him away for tinkering with the sun.

Jeff could prove his point, once he himself was convinced. That would free Lucille Roman of the initial charge and she could return to civilization.

Horne shrugged. He could get the spacecraft if it were impounded in Fort Knox. If it were left or kept in any place of less importance it would be that much easier.

So Horne was a frequent visitor to Jeff's laboratory during the next few weeks. He saw the development of the first jet grow from a tiny thing made of odd parts and baling wire to a mighty instrument which occupied Jeff Benson's attention so deeply that the man often forgot Horne was present.

Daily letters went back and forth between Jeff and Professor Lasson and between them they accomplished much. Lasson kept his eye on Sol and on the galaxy while Jeff worked out an angle here and unraveled a knot there and forthwith either wrote to Lasson or called him on the telephone to tell him what to seek for next. Then one day Jeff Benson went around nodding to himself. This happened to be one of the days upon which Horne had come to call and watch.

That night Horne wrote a careful letter to Washington and Jeff Benson had more visitors a few days later.

They came in, five of them, with sour looks on grim faces. There were a uniformed policeman, two younger men with the cold, clear, intelligent look of the government operative and two elderly gentlemen who, for all their obvious age, had bright eyes and very firm tread.

"Mister Benson?"

"Yes."

"Captain Hansen of the Chicago Police. I am Fred Cole and this is Louis Freeland of the F. B. I. This is Doctor Logan of the Federal Technical Department and the Undersecretary of State, Mister Scarland."

"I'm honored."

"You're close to arrest, Mister Benson."

"I am?"

"We're told you are experimenting with solar power."

"But I—"

Doctor Logan peered over Jeff's shoulder and nodded. "You are."

"I am," admitted Jeff. "Please come in."

THEY came in. They would have come in anyway. Fred Cole said, "You are aware that this is against the law?"

"I am. But it may be the means to our salvation."

"It was the means of our downfall."

"That is not true."

"Have you proof?"

Jeff smiled sourly. "Have you any proof that it is or was?"

"The statement of a few physicists."

"A statement is no proof. May I show you something?"

Jeff showed them the small jet, covered by a tall cylinder of black glass. Inside the jet was searing upward in a minute lancet of energy.

"I have proof," said Jeff. "Now, gentlemen—"

"I warn you," said Captain Hansen, "that anything you say will be used against you."

Jeff fixed Hansen with a cold stare. "I'm a bit appalled," he said sarcastically. "I'm completely baffled by an attitude that insists that no research be done."

"We have reason to believe that this thing may hasten the blow-up."

"Well, in answer to Hansen's statement, it is of little importance to me. Since I've been caught with the Solar Jet in my possession and have admitted it, nothing that I say can have any further bearing on the charge. Furthermore, if I'm taken to jail or even executed, what have I lost but a few days of life?"

"It strikes me that a people threatened with extinction should foster any sort of research rather than nurture their short remaining period of life. This is the time to take chances, gentlemen. That is why I took this one. Now, may I continue?"

Doctor Logan cleared his throat. "Mister Benson, the only reason you are not being taken to jail right now is because many men hold you in high regard. Yet you have broken a law—"

"Law!" jeered Benson. "What good are laws when the sun is blowing up?"

Scarland nodded quietly. "Let him continue."

Jeff nodded his thanks to the Undersecretary of State.

"Now," he said, "this jet you see comes from the most minute of orifices. Yet it is three feet long and a full eighth of an inch in diameter at its widest point. The spacial orifice from which it comes is less than three one-thousandths of an inch in diameter. This is the prototype of Doctor Phelps' model.

"With a job similar to this Phelps developed the jet that drives the Roman Spacecraft. However, Miss Roman is the type of person who sees in science only the chance to advance herself. She could not be bothered to investigate anything but that which showed commercial promise. Therefore Doctor Phelps died screaming that his jet did not tap the sun."

"Does it?"

Jeff nodded. "The jet consists of high-energy protons, radiocarbon, radionitrogen and radiooxygen, alpha, beta, and gamma. The proportions are exactly that predicted in a conglomerate mass undergoing the thermonuclear reaction called the 'Solar Phoenix' by Hans Bethe, its discoverer.

"I believe that Phelps scanned it for the standard solar composition—Russell's Mixture—and found the main components missing. But the standard composition is merely a by-product and not the main energetic reaction. If this thing taps the sun's energy you would not expect a lot of ashes.

"Now, gentlemen, turn this way."

They turned at his request and looked down the throat of a long latticework tube. It was eight feet in diameter and fully thirty feet long, somewhat resembling the raw framework of a dirigible.

"Phelps never made one this size," smiled Jeff serenely.

There was a mad scramble to get out of the line of fire from that mighty solar jet. "Have no fear," said Jeff. "This is not dangerous. Not unless I make it so."

"Get away from that switch!" stormed Doctor Logan.

Jeff laughed. "This jet, put into full operation, would produce a searing pillar of flame three feet in diameter and about a half mile long. A flame at nearly ten million degrees centigrade."

"Lord! What a weapon."

"Weapon, my foot!" grunted Jeff. "Were I to turn this on, not only everything in the path of the flame would go up almost instantly in sheer nothing, but none of us could live within a thousand yards of it.

"The end-result would be a radioactive path for miles along the axis of the flame and the byproducts would be devastating to the earth for miles around. The very air would burn and explode into its component nuclear particles."

"Then what is it?"

"It is a window into subspace!"

"A what?" exploded Doctor Logan.

"A window into subspace. Look!"

JEFF thrust the switch home. Down the tube by half its length a shimmering curtain appeared for a bare instant—to fade into a veritable well of blackness. Pinpoints of light dotted the background. They looked like stars.

Jeff nodded. "They do look like stars," he said in echo of their thoughts. "This is proof that my theory does hold true. The flaw in the conservation of energy is true! Every pinpoint of light out there is the focal point of a star, the mass-energy resulting from the losses in the star being hurled through the veil that separates us from that universe to pile up there until subspace is strained by forces it was never created to take."

"But what does it mean?"

"Natural laws mean nothing in another universe—which this is. We now know what makes a nova."

"Go on."

"Like the lifting of a stone, you store potential energy in it which is returned when it is dropped back to earth. When, in this universe, energy is converted from one medium to another, part of that energy is thrust into this other universe which I call subspace.

"The energy required to lift the stone is not all used to lift the stone. Some of it enters this space, forced there by the effort. When the stone drops and hits the earth the energy returned to the coordinate system is not fully used. Some of it is forced into subspace.

"There is pressure against this forcing of energy and this pressure builds up until subspace is too weak to contain it. Then this storehouse of energy bursts through and the star explodes."

"And a supernova?" prompted Doctor Logan.

"We are all familiar with the fact that a supernova is supposed to occur when the dying sun gets cold enough to collapse according to Chandrasekhar's theory. But when the mass starts to collapse towards zero volume, which it will do if the mass is only a half million times the mass of Terra, the collapse forces raw matter into this subspace.

"Ton after ton of raw matter, millions of tons of raw matter composed of mere nuclei

crammed together in a dissolute state, are forced into this universe and instantly become that mass-equivalent of raw energy."

"Logical. Logical. But have you proof?"

"As I said, most of the laws of celestial mechanics in this other universe do not hold according to our theories. Look—I take this miniature jet and walk to the far end of the tube."

The black tunnel glowed with intolerable light that blinded them all. The light, ponderable and deadly, lashed against an invisible plane that barred the tube where the shimmering curtain had been when Jeff turned the equipment on. It was a sight to dizzy the mind. Fifteen feet down the lattice-work of steel and glass was a circle of blinding energy. Nothing could be seen through it. Outside of the tube was Jeff's laboratory. There was no intolerable light flashing back towards the end where Jeff held the jet. His face was not even illuminated.

"But what is this thing?"

"This thing is a modification of the Jet," explained Jeff. "Phelps never reached this point. The jet is controllable in intensity by simple means. What you look at, gentlemen, is the controlling surface that separates or bars the energy from coming in a single devastating burst."

"But what is that awful light?"

"You are looking through a window into sub-space." Jeff smiled. He returned to face them and as he turned the corner at the far end of the tube the light died. It was just as though Jeff had been carrying the light in his hands. Now that he was no longer at the far end of the hollow tunnel the light was no longer visible. But it did not die quickly, like a lantern carried out of the line of sight around a corner or behind an eclipsing mass. It died slowly—fading until gone.

"That is raw energy," explained Jeff. "Energy in the essential state. Either gamma heterodyned by my machine here or energy particles bombarding the material that separates the universe we know from this universe you now look into. In either case," said Jeff to the Undersecretary of State, who might not be able to follow the higher scientific discussion, "the energy is rendered visible by the device here."

"But it followed you."

Jeff nodded. "That energy is alien to that universe. If you can liken the situation to the inflation of a balloon you might say that the energy is driven into that alien space.

It will always try to return, to get out again, as the gas in a balloon does."

Doctor Logan shook his head dubiously. "You speak of energy being driven in. That too takes energy."

"Of course. And like the energy required to establish a magnetic field, which is returned when the field is permitted to collapse, this energy is returned when the lost energy comes back to our universe.

"In fact," said Jeff seriously, "it is this portion of the energy that causes the inter-spacial strain that eventually ruptures and results in a nova. It is sort of like a back E.M.F."

"Then the fact that you were carrying an orifice for the energy to return brought that collection of energy particles and raw energy to the vicinity of the opening?"

"Yes."

"But what do you hope to do with it?"

Jeff shrugged. "Out there are no planets that I know of," he said in a low voice. "Yet, from what I've seen, there is no limiting velocity such as we have here in this universe. If we can discover a means of entering and traversing that sub-space we can migrate."

The Undersecretary of State looked out through the tube once more. He peered at one of the distant smudges of light and shook his head.

"Go ahead and experiment," he said. "I'll incarcerate no man who can bring his own sunshine into jail with him."

CHAPTER XIII

The Howling Mob

IN a remote section of the Rocky Mountains Lucille Roman was tasting the first bitter elements of defeat in her hitherto victorious life. Her ship was unspaceworthy, for Lucille Roman lacked the skill and equipment necessary to weld the bullet holes in its hull.

Even had the ship been spaceworthy, she knew of no place to go.

Through all of her life she had been a winner. This had been often sheer luck, though more frequently it was the result of her native shrewd ability to manipulate and coerce people through her beauty and the power of

her wealth. She had often been close to defeat, but its proximity had merely served to steel her will and force her to fight vigorously enough to win.

Now she was hunted and hated by every man.

She did not know of more recent developments because she had long since forsaken the radio, thanks to its constant dirge of impending disaster.

For all of her ability to handle and control people, none would listen to her and she had lost the power to coerce. Instead of fawning upon her riches or acknowledging her managerial ability, people would now attack her viciously for the disaster they believed her to be responsible for.

In fact, Lucille was not much of a scientist. She knew little of it and admitted it. She had always been able to buy the best in brains. She preferred this to cramming her head with unnecessary facts and theories. Better that brains be used for what they were best fitted.

Let the thinker think and the doer do. He who could buy brains could buy the brains of those who could not or preferred not to use them to amass wealth. In that way, science was paid for and the financier gained his end as well.

But here she was, ignorant of the facts and about ready to accept the responsibility for having started Sol on its way towards nova. If prominent men said so, who was Lucille Roman to argue the matter with them?

So while radio, video and newspaper were explaining Jeff Benson's theory of nova, Lucille Roman sat in a remote and lonely spot and mentally chewed her fingernails—and ran inexorably out of food and water.

She opened her last can of paté de fois gras and laughed a little at the irony of Lucille Roman eating out of a can instead of dining luxuriously from Royal Crown Derby china with candlelight and sterling silver and a butler to serve.

She drained the last water from the tank and drank it though she would have preferred a bath. Then, facing starvation which, Lucille Roman took the lesser evil and decided to go to where food and water might be procured.

She lifted the spacecraft and headed south towards the small industrial town which owed its being to the large dam that furnished irrigation for the district and power for three states. . . .

Big Ed was first in line when the newspapers arrived from the big city. The spot broadcasts were sketchy and for full coverage of the facts he preferred the papers. So when the papers arrived Big Ed and most of the people of the town were waiting.

As is usually the case, the out-of-town edition was tabloid in size and tabloid in editorial policy. The rewrite men had fastened upon the meaty part of the news and they gave it full treatment. The portion clearing Lucille Roman of charges regarding the instability of Sol was secondary to the latest facts regarding solar blow-up.

A picture newspaper, the tabloid might have emblazoned Lucille Roman being escorted from jail because Lucille Roman made excellent picture material. But Lucille Roman was not to be found, let alone escorted from durance vile—so no timely picture was available.

Instead there were pictures of Jeff Benson and his equipment, a full page of shots showing the progress of sun spots and some prints of solar prominences exhumed from the newspaper's morgue and used because they were exciting when properly recapitoned.

To give them due credit the rewrite men did a good job of presenting Jeff Benson's theories to the public. That they did not do the job properly is no fault of theirs. Had they been capable of understanding the theory in toto they would have been scientists rather than news men.

SO the salient point in the news article said, "Energy converted or loosed or changed from potential to kinetic energy or from kinetic to potential energy is not completely transferred. Some small percentage of that energy is forced into subspace, where it is stored like the air blown into a balloon. "When the amount of this energy reaches the breaking point subspace is ruptured like the bursting of a toy balloon that is blown up too high. When subspace is ruptured the stored energy is released to come back to this universe. This is the cause of a nova."

Such was the meat of the theory. But what the newsmen failed to convey properly was the ridiculous disproportion between the energy converted in the core of the sun and the energy converted in the most massive of man-made power plants.

So Big Ed turned to his neighbor and mumbled, "Energy, huh?"

His neighbor nodded glumly. "Let's stop it!" he cried.

Thirty seconds later they were armed and heading for the big dam and its hydro-electric plant. They forgot that they would convert as much energy destroying it as it was converting now. And they were ignorant of the fact that the hydro-electric plant could have run from then until eternity without matching the solar output for a single second.

* * * * *

Lucille Roman hung poised over the dam, watching. The men who tended it stood in the vast concrete runway atop the structure and waved at her. None of them drew a gun nor did they seem in the least bit angry. Their gestures were friendly signals of greeting without expression of anger.

It might be a trap but Lucille had to have aid or die and dying was inevitable anyway. So Lucille Roman, with little to lose, dropped her spacecraft onto a concrete slab at one end of the big dam and waited. The men scurried across the runway and came near the base of the ship.

Gingerly, Lucille opened the door and peered out.

"Come on out!" called the foremost.

Lucille stod in the doorway, quivering with fear, driven by necessity.

"I'm Tom Lichty. I'm foreman here. Anything we can do for you?"

"I need food and water. But—?"

"We just heard the news. Lucky, Miss Roman."

Lucille blinked. *Lucky?* She dropped to the concrete. "What is it?" she asked eagerly.

"What's the matter? No radio in that thing?"

Lucille nodded. "There is but it said nothing but how much they offered for my head. I turned it off."

"Oh. Then you don't know the news. A guy by the name of Jeff Benson just convinced the State Department that your jet did not cause the nova. You're no longer a criminal."

Lucille leaned back against her ship and took a deep breath. Relief from strain was instantaneous and reaction terrific. Her flight had been her first experience of being the quarry for the professional hunters of the known world. It had been nerve-wracking.

Lucille Roman had never run afoul of the law before and the experience of terrible fear and absolute helplessness, of knowing neither where to go nor to whom to turn to was the more bitter by contrast.

And it was Benson again! Lucille shook her head slowly. She was forced to admit that the young scientist cared little for the inuendoes of life and the plying of pawn and financial rook against an adversary.

She knew he was honest and truthful—that if Jeff Benson believed the Roman Jet was not responsible for the nova, the fact that he had every reason to dislike the owner of it would not stop him from releasing her from the responsibility. Another type of man would have been slyly happy to gloss over the truth for the inward satisfaction of knowing that she was in trouble.

But that did not help her to understand Jeff. The fact that she realized his desire to be honest did not help her to understand why. He might have been able to gain, otherwise, though she could not see why at this point. What made him tick?

Lucille could not know, having been brought up in a life where honesty was best when tempered with a bit of good sense, where being legally right was more important to success than being ethically right.

NOT that Lucille Roman would stoop to foreclosing on the homestead and throwing the poor unlucky indigent out onto the street when the loan came due. But she considered clipping another financier in a clear game of big money and stock-manipulation as the fairest sort of game. That way it was more of a sport, even though economic empires were at stake and no holds were barred.

"So I'm free?" she breathed.

Lichty nodded.

"Can I buy water and food?"

Lichty laughed. "Here's a nice lake behind the dam. I doubt that you'll lower the level of it by filling your water tanks. We've got a company store here. We'll sell you some canned grub—enough to get you to the nearest storehouse for a real fill-up. You can lower a hose?"

"There's a watercock but I've no hose."

Lichty gave an order to his men and they went into the blockhouse near the ship. Lichty climbed into the spacelock, inspected the watercock and nodded. He went with his men into the blockhouse and, as they came

out with a case of canned food, Lichty followed with a length of hydraulic hose.

It fitted, and in a minute or so, water was being pumped into the storage tanks from the lake behind the dam.

They all were busy and so they did not hear the first rumblings of the oncoming horde. When Big Ed led his crew of angry townspeople over the crest of the nearby hill Lucille was standing in the spacelock and Lichty and his crew were resting while Lichty wrote a brief bill of sale on a sheet of notebook paper.

Big Ed's crowd roared.

Lucille screamed.

Lichty looked around and shouted, "Hey! Stop!"

One of the uniformed guards went down, overwhelmed by the crowd because he chose to fend them off instead of counter-attacking instantly. Lichty ran towards them, shouting. The crew behind him spread out cautiously.

But Lucille had seen a mob before. She snapped the switch that closed the lock and by the time Big Ed came to the concrete slab the spacelock was closed.

"There's Roman!" came a cry and once again the spacecraft was pelted by stones and bullets.

She lifted the ship above them and poised indecisively. Lichty and his crew went down and were carried to the back of the howling mob and tied so that they could not interfere.

Big Ed and his helpers broke into the blockhouse and emerged rolling a large red steel barrel before them.

Lucille shook her head. Dynamite or nitro, she supposed. She understood that a barrel of explosive would make no more than a tiny dent in the massive concrete dam. If it did do real damage there would be great loss of life in the artificial valley as well as disaster in the many cities that depended upon the hydro-electric plant for light and power.

She dropped her spacecraft lower and put a glistening, eye-searing curtain of pure power between Big Ed and the dam.

One man ran forward and fell sprawling before he came within twenty feet of the eight massed jets.

Then, for the first time in days confident of herself, Lucille Roman lifted the ship and jockeyed it towards the foremost of the mob. They broke and scattered before those searing jets.

They broke and ran for cover and fell as they ran, seared with the torrent of heat that spilled from the jets that roasted the air near them, and so heated the concrete that it was powdery when it had cooled again.

Big Ed fell back and tilted the barrel. It rolled forward under the ship's wavering course and exploded with a terrible roar. Lucille's ship was hurled upward jerkily, to catch itself and remain poised ten feet higher than before.

But steel and concrete flew from the top of the slab and shards of debris rained down in the crowd.

Lucille aimed the tail of her ship at them once more and they broke and raced for shelter. They left Lichty and his crew tied to the steel railings at the far edge of the vast concrete enclosure at one side of the dam.

Knowing that the mob would not return as long as the ship remained in the vicinity, Lucille dropped to the enclosure and opened the spacelock as quickly as she could. She untied them and then, with them, raced back to the spacelock.

"Wait," said Lichty.

"For what?" she asked breathlessly.

Lichty smiled sourly. "We're not going anywhere."

"But they'll come back."

LICHTY shook his head. "Nope," he said. "Mobs aren't like that. They have little determination. Remember, you're not too far from the state where they used to send just one Ranger to quell one riot. They're broken now and pretty soon good sense and shame will come and they'll be sorry for having made idiots of themselves."

"But what are you going to do?"

"We've got jobs to do even though it may not be long. We'll stay."

"But—"

"We'll find Big Ed. We can explain to him and let him take care of the rest. Now—"

Lichty was interrupted by a faint cry at the edge of the clearing. He turned quizzically, then went toward the far gate. Slowly, overcautiously perhaps, Lucille Roman followed Lichty and his crew, wondering what kind of man could walk into such danger without a qualm.

The cry was augmented by two fainter cries. She came up to Lichty, who was bending down over someone on the ground. Two men stood by, a child in each man's arms.

The woman on the ground looked up weakly. "*You!*" she breathed in a voice that held as much hatred as her pain-filled body would permit her. "You did this."

Lucille shook her head. "No," she said. "You did this."

"*No!*" cried Lucille.

The woman obviously did not hear. "You did this," she said again, more faintly this time.

Lichty stood up and shook his head. "Hit with a shard of the nitro barrel," he said.

"You did this," breathed the hurt woman. Her voice was a dry cackle and she tried to raise herself, to raise a hand, to point an accusing finger.

Lucille shook her head again. How could she tell this woman that she was not the cause? How could she explain to a woman grievously hurt that she too was but an innocent bystander to a cosmic catastrophe so large that the antics of man and his highest achievements were but a mote of dust by comparison.

"Who is she?" asked Lucille, at a loss for words but feeling the necessity of saying something.

Lichty shrugged. "I don't know," he said.

"But we must do something."

Lichty shook his head. "Someone's wife," he said in a soft voice. "Curious—perhaps seeking a thrill. She came to watch and remained to die."

"*Die!*" screamed the woman. A burst of energy roused her and she sat up by sheer effort. She leaned back against one of Lichty's men and looked into Lucille's eyes.

"You did this!" she cried. "You did—" She never finished.

The last ebbing force of her life was spent in anger and hatred. She died hating Lucille Roman and her face was twisted in helpless rage when Lichty's man put her torn body back on the concrete and covered it with his jacket. A rip in the jacket, torn by one of the mob, came over her hand and the hand thrust itself through and writhed faintly, opening and closing.

Lucille covered her eyes and turned away.

A childish wail caught her ear and she dropped her hands to look. Children, two of them, one in each of two men's arms, were trying to get free and run to their mother.

Dourly, for tenderness did not come easily to the hydro-electric crew, Lichty led the way from the gate back to the spacecraft.

He ignored the childish shrieks as his men tried to soothe the two children.

"What'll we do with them?" asked Lichty.

"I'll take them," said Lucille.

"Why? What can you do?"

Lucille shrugged. Her mouth was dry.

"I did it," she said.

"Don't be—"

"I'll help them," she said. "Who are they?"

"They were Jimmy Norberg's kids."

"Were?"

"Norberg was unhappy. When the nova was announced he decided that he had worked hard and long enough. He drew his dough from the bank and caroused until it was gone. A day after that he shot himself."

"Leaving her alone," said Lucille in a hard voice. She looked at Lichty and then at the twins. A boy and a girl, about four years old. A boy and a girl with a normal life expectancy of another sixty years.

A boy and a girl who might be the new Adam and Eve on some distant planet. A pair who would be in the prime of their lives by the time the awesome crossing was completed and who could be trained not to suffer the terrors of year-long spaceflight in a tiny metal ship. A pair trained to carry on the civilization started here near Sol.

"I'll take them," she said firmly. "Maybe, instead of having in my hands the cause of Sol's death, I control the future of mankind!"

CHAPTER XIV

The Feminine Touch

JEFF BENSON'S eyes widened a bit when Lucille Roman carried two children into his apartment and placed them gently on his broad bed.

"They're dead tired," she explained. She dropped into the easy chair beside the bed and put her head back and looked at the ceiling.

"You're tired, too," he said quietly.

"Not so terribly," she started. She sat up but Jeff put his hand on her forehead and shoved her back gently.

"What's the tale?" he asked.

"I seem to owe you a lot," she said.

"Nothing," he told her.

"I'm free. Isn't that something?"

"Only a matter of fact. You did nothing."

"I used the jet."

"So? That did nothing."

"Maybe it started the whole thing."

Jeff shook his head. He explained what he knew and took her then to his laboratory where he showed her the tube connecting the universe with subspace.

"This is a well-controlled orifice," he said with a smile. "This is no mere rupture nor even a clean puncture. It's more of a well or valve that can be used at will.

"No, Lucille, the nova was the means of discovery of the jet and the jet is not the cause of the nova. Which brings us to you. Just what have you in mind for the kids? And what are you going to do with them?"

Lucille looked up at him hopefully. Her face was wan, pale, devoid of the usual makeup, but her eyes were bright. "This is not for me," she said softly. "It's for them. You told me that we could not live out the journey to another star."

"We couldn't."

"But *they* could!" said Lucille proudly.

Jeff shook his head and smiled tolerantly. He put a gentle hand on hers and said softly, "They have the life expectancy," he said. "But—"

"So we can take them and take care of them until they are able to handle themselves. Then, when we die, they can go on."

Jeff shook his head again. "No go," he said. "There is the matter of supplies. Even granting some unknown means of sending them out alone, there wouldn't be enough." He thought for a moment.

"And even if we had clockwork to feed them regularly and machines to take care of their every physical need they would eventually end up by just going on and on and on through space until they died.

"For you see, Lucille, the ship would be their life to them and they might find a planet terrifying and hostile compared to the closed-in comfort of the spacecraft. They could never survive alone."

"There must still be some way," she said.

Jeff looked into the mouth of his tube. "Maybe there is," he said softly. "But I've yet to find it."

Lucille looked up at him again. "For them, Jeff?" she pleaded. "Can I help?"

"You?"

Jeff was interrupted by a muted roar from the back of the building. It was a strange roar to him but Lucille stiffened at the sound and put her hands to her throat.

"The ship!" she cried in a choked voice.

"The what?"

"My ship. That roar was the jets!"

Jeff led the way out through the back door. The air was warm, acrid, still skirling crazily. High in the sky was a tiny circle of too-brilliant dots. The diameter of the circle dwindled as they watched.

"My ship," moaned Lucille, pointing up. She turned to Jeff, her face filled with pain and misery. "Can I do nothing right? Must everything be wrong?"

SHE swayed and Jeff caught her. She sobbed against his shoulder for a moment and then straightened a bit. "Now," she said brokenly, "I have nothing left."

Jeff smiled tolerantly, sympathetically. "You can help me," he told her. He never realized that he was piling the proverbial coals of fire upon the head of one who had treated him so shabbily in the past.

But Lucille Roman did. She choked, swallowed and remembered that she had never offered anything in her life without anticipating some reward. The days of weariness and strain and fear mingled with her emotion, and once more she swayed towards Jeff. She caught her gently.

"Jeff!" she said in a thick, dry voice.

"Tell me tomorrow," he said softly. He scooped her up and carried her inside.

Jeff went down to his laboratory to work and he carried with him the picture of her wan face, her eyes closed in sleep. Lucille slept with one arm around each of the twins in Jeff's large bed.

* * * * *

Charles Horne exulted in the performance of the spaceship for hours after lifting it from behind Jeff's laboratory. He put it through its paces high in the stratosphere, paying no immediate attention to the air that screamed out of the punctures in his hull.

Then, realizing that they must be fixed, Horne took his stolen ship north into Minnesota, where he had a summer cottage beside a lake. From a nearby railroad siding and freight yard Horne stole an acetylene welding outfit and spent a day or so experi-

menting with the outfit until he had mastered the rudiments of aluminum welding.

He sealed up most of the holes he could see, took the ship high in the air until it had driven quite a bit of air from the inside. Then he dropped it into the lake and went around on the inside, marking trickles of water driven into the ship by the lowered air pressure. By the afternoon of the fourth day he was quite adept with the welding outfit and he spent most of the evening rewelding some of his earlier efforts.

On the morning of the fifth day Horne was ready to try the first phase of his plan. He took the spacecraft out over the North Atlantic and, armed with a table of commodity sailings, dates and hours and ships and tonnages, Horne located a ship of about five thousand tons that was loaded with grain.

Caring nothing for the superstructure, Horne balanced the ship on its tail until the searing jets scorched the deck paint, curled the steel masts and sent the radio antenna and guy wires flying off in molten droplets. He seared the bridge to a smoldering ruin and the woodwork on the ship's upper structure blackened and flared away almost instantly.

The men on the deck died instantly and more men, running up to see what was going on, were met with a jet of atomic flame that killed them in their tracks. For an hour he played around the ship, bathing it with the fierce atomic radiation from his jets until he was certain that any man below deck must be dead.

Then Horne dropped the spacecraft on top of the ruined ship, nestling it in the hollow of the blackened superstructure. He spent hours fastening the spacecraft to the vessel with cables and chain from the ship's stores.

With a prayer of hope Horne set the power high and watched.

Spacecraft and surface ship moved forward, the sea-going ship nosing down because the thrust was high above the water. Horne increased the power and the ships moved more swiftly. Horne put power on the lower set of jets and the noses of the ships went up slightly.

He increased his power more and the surface vessel moved through the water faster than it had ever been intended to. It lifted, then skimmed, then touched only crests. Finally Horne turned the nose of his spacecraft up into the sky.

Still dripping water, the seagoing ship left the surface of the earth and rose high in the sky.

Gaining speed, Horne headed for space.

Free of Terra a few hours later, Horne consulted his sky maps. He located Procyon easily and headed towards the star with as high an acceleration as the Roman Spacecraft could develop.

Terra was lost in the sky behind by the time Horne cut the sea-going vessel loose. Its velocity was far above the escape velocity for both Sol and Terra. It would, hour after hour, day after day, perhaps year after year, plow through the silent black sky towards Procyon, its cargo preserved by the airlessness of space. When they picked it up again, be it days or years away, the grain would be in good condition.

No hull could hold the food and supplies needed for a trip across the void to another star.

But many hulls, laden with food and water and air—meat and vegetables and starches—tobacco and liquor—clothing and games and books and tools and medicines—hull after hull wrested from the ocean of earth and hurled into the sky—would do the trick. Some would be lost but most could be located by radar and ultimately taken along.

Not that Horne hoped to get any ships off early enough to have them picked up near the end of the long trek. But once they were removed, one by one, from the grasp of Ter-ran gravity he planned to chain them together in deep space. Hauling them along would be duck pie.

True, the total mass might be staggering in quantity and the resulting acceleration reduced to a mere crawl but a few moments with pencil and paper showed him that an acceleration one one-hundredth that of Ter-ran gravity could result in amazing velocities when continued over a period of time.

Let men laugh at the impossibility of crossing space to the stars!

Horne glowed inwardly as he saw the first of his supply train vanish into the sky. He swapped ends with the spacecraft and started to decelerate in order to return to earth. It took a rare combination of brains and ruthlessness to survive, and man—in the person of Charles Horne—was fit.

* * * * *

It was a mild winter. The initial chill of

autumn faded into what should have been cold weather but the increasing activity of Sol kept the temperature well above freezing even though the calendar read December. The southern hemisphere reported a vicious summer and, as winter faded and the early months of spring came, the thermometer took an uprise never before reported.

Sol had an angry look. Intolerable to the eye unless viewed through special glasses or glass covered with soot, Sol bore down hotly in an angry sky. Sol could be viewed directly through thick glass or by projecting his image on a wall or sheet of white paper through a pinhole or a long-focus lens.

Then the myriad sunspots could be seen, and their opposite spots of searing brightness could be viewed in boiling motion somewhat like bright metal breaking through the slag in the melting pot of a foundry.

The Aurora played nightly and ruined most radio transmission, completely disrupted any attempts at video and often tied up the land wires for hour upon hour. Magnetic devices acted strangely and ships at sea wandered with aimless compasses on cloudy days and stormy nights. Only under clear skies could they hold course.

People worked doggedly and only enough to keep themselves alive. Gone was ambition—planning for the future.

Late in March Lucille Roman awoke from a fitful slumber. It was unbearably hot, and lightning flickered along the horizon constantly to the muttering of distant thunder.

Lucille was drenched in perspiration and she wanted a cigarette. She rose quietly, without waking the twins, went into the bathroom and showered. She emerged from the shower and looked around the living room for a smoke.

Jeff was not asleep on the studio couch—therefore he must be working and would have cigarettes.

She went downstairs.

JEFF stood before the great tunnel into subspace, watching the performance of a small betatron that hurled its cone of hard gamma into the mouth of the tunnel. He was engrossed and did not hear Lucille enter. She understood his concentration and found a cigarette from the package on the desk behind him. She lit it and sat down on the desk quietly.

She watched him for fully a half hour. Jeff stood immobile most of the time, mov-

ing only when something required adjustment or needed checking. He copied few notes but consulted the back pages of his notebook regularly.

Lucille guessed correctly that Jeff was re-checking some important point of his endless experimentation.

Somewhere out through that tunnel Jeff hoped to find a future for the human race.

Jeff finished and snapped off the equipment.

"Luck, Jeff?" she asked.

He turned. She saw from the cut of his shoulders and the haggard look on his face that all the luck he had had was bad.

"Well?" she prompted.

"It's no use," he said.

"What happened?"

Jeff looked once more into the tunnel, inoperative now. He shook his head. "That is an utterly alien universe out there," he told her. "It is impenetrative."

"But—I don't understand."

He smiled grimly. "When matter is hurled through that veil it becomes radiant energy. Radiant energy hurled into the sub-space, as I was just hurling it, emerges on the other side as the mass-equivalent of matter minus whatever percentage is lost in the conversion.

"It represents the back pressure that eventually ruptures the separation and causes stars to go nova. We might easily penetrate subspace with the right kind of equipment. But when we emerged on the other side we would be reduced to radiant energy."

Jeff dropped into the easy chair beside the desk. "It's no good," he said. "We're licked!"

Jeff's face fell and he stared at the floor stolidly. His eyes were hollow and his face was gaunt. Sheer hopelessness lowered his vitality even more. For minutes he sat, enveloped in a mental fog, and the only sounds in the big building were the sounds of his breathing and the periodic puffing of Lucille as she smoked her cigarette.

Jeff became more deeply immersed in thought but it was all circle-thinking—for the sum and substance of it was to lead him back along the same lines he had started out on. He sat half-hypnotized and half-asleep but unable to relax because of the strain.

Lucille snuffed out the cigarette and watched him with a puzzled frown.

Before her economic empire began to crumble Lucille had been too busy to try

to understand Jeff. What little thought she gave him was unfavorable because she believed him to be in league with her financial enemy Charles Horne. She knew differently now but her new knowledge merely made Jeff less understandable. When her holdings were reduced to nothing Lucille had thought she might be able to understand him. He was still an enigma.

She had been trained to handle and to control, to add wealth and material belongings. She mourned their loss and at one time she believed that Jeff's lack of sympathy for her loss of material belongings was due to the fact that, never having had much wealth, he had lost little and therefore did not feel the loss.

She now knew that whether or not material wealth was available to the mentally brisk and the financially ruthless Jeff cared not.

But he worked with great machines that she knew as little about as Jeff knew about the corporation machinery. Lucille had thought the calculations of finance were complex but Jeff juggled mathematical symbols that dealt in sheer abstracts and were as far ahead of Lucille's grasp of math as her manipulations were above the simpler forms of grade-school arithmetic.

Jeff just did not give a hang about finance—and Lucille was now depending upon him for her life. The financial wizard had to do the depending.

LUCILLE shook her head slowly. She compared him with herself and those she knew and found little basis for comparison. With complete and final obliteration facing her she had been unable to think clearly. Niggling fear chipped away at her constantly. Never was she unaware of it, even in the most compelling concentrations, when other more imminent things demanded her attention.

But Jeff worked on, often lost in thought to the exclusion of everything else.

She half-understood how a man might think and work toward escape from an almost-certain death. She had heard that definition of a rational man—the man with five minutes to live who took four of them to think of a plan and one minute to execute it. But she and most of the people she knew were so paralyzed with fear that clear thinking was impossible.

Yet Jeff worked on and on and now that

he realized failure he was still sitting there, thinking.

"Jeff," she cried, "what kind of man are you?"

Jeff jumped. "What?" he asked dully.

Lucille flustered. "I was wondering about you."

"Me?" he asked with a crooked smile. "I'm a rank failure as of this moment."

"But—"

"This is finis," he told her. "The end. We can't go through subspace and that is the final answer." He leaned back and looked up at the ceiling. "Poor kids," he said in a whisper.

Jeff's eyes filled and he turned his head aside and rubbed his eyes with the back of his hand. He stood up. "Pfu!" he said in a voice of complete dejection.

"Oh Jeff!" cried Lucille. She reached for him, caught him by the shoulders and drew him to her. He half-sat on the desk beside her. Lucille cradled his head in her arms and pressed his face to her breast. She swayed back and forth, rocking him gently and murmuring wordless sounds in a soft low voice.

Jeff gave a shuddering sob, they relaxed, and Lucille felt for the first time in many months the upsurge of emotion that came with the knowledge of having accomplished something. Unable to truly appreciate Jeff's work and its failure, she exulted in the ability to give him some measure of comfort.

Then Jeff stirred and straightened. "Why do we go on trying?" he asked.

Lucille put her hand against his cheek. "There's always hope," she said quietly.

He shook his head.

"What else?" she asked him.

He jerked his head back over his shoulder at the huge latticework that generated the window into subspace. "Might as well open that all the way," he said. "It would be so quick that the nervous system would have no time to register pain or fear or anything. Instantaneous release from this inevitable looking forward to terror and—"

"Jeff! *No!*"

"Oh, I won't," he said in a dejected tone. "But there's darned little to live for." Then he took a deep breath, shook his head as if to shake dejection from his mind and stood up straight.

"Back to work," he said in a voice of forced brightness "That's the answer, even if the nova catches us still fingering dials and watching meters."

"What next?" asked Lucille. Unable to suggest she asked questions because she hoped to prod his mind into some channel safer than the sordid contemplation of failure.

"Take another tack, I guess," he said. He turned towards the equipment but Lucille caught his hand.

"No you don't," she said softly. "No more work this night."

His protests were mild as she led him from the room.

CHAPTER XV

Away From Earth

CHARLES HORNE sat in the control room of his stolen spacecraft and added up his take. So many hundred tons of this, so many millions of gallons of that, so many billion cubic feet of the other. He had a large volume in front of him; a strange volume to be found in such a place.

It was a great mail-order house catalogue—a curious volume for Horne but eminently practical. For within the covers of the large mail-order catalog were listed the physical needs of mankind.

Horne knew and appreciated the fact that he was soon to be leaving Terra forever. Any item he forgot up to the time of his departure would be forever lost, never to be added to his collection unless it were some item he could fashion himself, either aboard the spacecraft or on that distant planet at a distant date.

Knowing that he had no perfect memory, Horne had spent hours poring through the catalogue and listing things he found necessary or desirable—things that he realized he might have overlooked.

Horne had had many the hour to sit and think. Piloting a spacecraft is not like driving a car nor even like piloting a superliner of the airways. A car requires constant supervision at the wheel. A superliner can run on the autopilot for hours with only an occasional readjustment by the pilot. A spacecraft, on the other hand, requires little or no supervision for days on end because of the medium through which it travels.

The Roman Spacecraft had been fitted with the finest in automatic machinery. It was therefore necessary to drive the ship manual-

ly only at takeoff, during such maneuvers as were necessary once the ship arrived at its destination, and in landing.

To take a trip of fifty million miles, for instance, one takes off manually and sets the ship on course at a constant acceleration. One then retires until half the distance is covered, at which time the pilot turns the ship end for end and applies the same power.

This results in deceleration, and at the end of the same period of time, the fifty million miles have been crossed and the ship is then at zero velocity relative to its starting point. This is theoretical of course but the difference is so small that a couple of hours of effort at the control board brings one to the desired point.

So, in the intervals between his seagoing piracies and the hurling of the stolen ships along their orbit, Horne had plenty of time to think and plan. Then, when he left each stolen ship to return to earth, he had more time for pondering.

He had planned well, had Charles Horne—very well. He only lacked the mapping of certain intricate details which could be supplied by Jeff Benson, who was quite adept at such calculations. Those few calculations, a few snivets of equipment supplied by Benson, and one other detail.

One more factor.

It was a poor master who had no servants—a poor emperor who had no subjects—a poor man who had no mate.

There would be small point in heading for Procyon alone. There was no future in it, either for Horne or the human race. Not that the welfare of the human race concerned Horne but the end-result would be one and the same.

There were many women Horne could take along. A single announcement of his plan would have given him the chance to make a selection from virtually all the women of the planet. He could pick and choose. He could take a harem if he wanted to.

As usual Horne wanted the unattainable. Like any other man who could select his mate with a casual wave of his hand Horne wanted the one woman that he had never been able to tame in less trying times.

Lucille Roman had spirit—she had beauty and she had ability. All admirable qualities for a wife and mother—but Horne was not viewing Lucille Roman as anything but a factor to be conquered, a will to be bent to his own. He wanted to hear this woman,

who had always acted his superior, acknowledge the fact that he was the superior creature.

Horne could have for the asking women willing to offer him honor, love and affection, freely and without conquest.

Horne preferred the conquest.

He wanted also the mighty jet that Benson had been using as a window into subspace. With millions of tons of stolen shipping passing through space on the way outward at varying velocities, Horne wanted the huge jet to drive them once they were collected and tied together.

THE eight jets on the spacecraft were able to achieve escape velocity with an eleven-thousand-ton load.

His millions of tons of stolen goods were all beyond the velocity of escape from the solar system so that, if he tied them all together and used the spacecraft jets, he could still accelerate.

But the amount of acceleration in free space is a function of the force applied versus the mass to which it is applied. A heavy stone falls at the same rate of speed as a light stone on the surface of the earth because the attraction is proportional to the mass. As the mass increases, requiring more force to move it, so increases the force of attraction accordingly.

But in free space, with an increasing mass but with a constant force from his jets, every increase in mass would result in a proportional decrease in acceleration.

The mighty jet in Jeff Benson's laboratory rendered puny the total force of Roman's eight lesser jets. With Benson's jet driving the countless tons of stolen shipping, the resulting acceleration would rise to a practical level.

Benson would supply that, plus the calculations necessary for the trip to Procyon.

And, thought Horne with a sly grin, he would collect Benson, the jet and Lucille Roman in one fell swoop. Once he was on the way with all the necessary calculations made and the equipment working, Jeff Benson could be disposed of. Then, with no possible interference from man or beast, Charles Horne could take over the job of breaking Lucille Roman's will.

She would use a woman's weapons on him, to bilk him of his aluminum interest! Horne would retaliate by using a man's weapons and strength to conquer her!

Horne had plotted well. He had made a few errors, but his batting average was high.

The fact of the matter was that he had made only one major mistake and that had not resulted in disaster. It had only delayed his plans a bit and another bit of plotting had rectified the error.

So Charles Horne landed in the vacant lot behind Jeff Benson's laboratory. He was filled with confidence that he could cope with Benson, could talk the man into anything.

He opened the door boldly and walked in with a confident smile.

"Howdedo, folks," he greeted them.

"Horne!"

"I'll be—!"

"None other," chuckled Horne.

"Where've you been?" demanded Jeff.

"Making plans," said Horne. "Now I've come for you."

"You've what?" said Jeff.

"Come for you."

Lucille looked around the laboratory and picked up a large half-round file. A few short weeks before she would have reacted like any other person not too familiar with tools. She would have reached for a hammer or some other blunt weapon. But she had watched Jeff at work. A hammer might be an obvious bludgeon but a fourteen inch half-round bastard file is a very nasty weapon.

"Why?" she asked with a definite snap.

Horne faced her. "I've come to apologize to you too," he said smoothly. "You wouldn't have lent me your rocket—"

"How right you are," snapped Lucille.

"But it was necessary that I have it. You'd not have trusted me even though I'd come to you in good faith."

"Impossible."

"Huh?"

"It's entirely impossible that you could offer even a poor substitute for good faith."

"This may convince you," smiled Horne. "Yes?"

Horne faced Jeff. "Give a dog a bad name," he said with a smile, "and it's a bad dog forever after. I've a bad name. Therefore the only way I could prove myself was to do what had to be done by force and then come back to show you that I mean well after all."

Lucille hefted the file. "What's on your nasty little mind?" she asked him pointedly.

"We're on our way to Procyon."

Lucille laughed scathingly.

"Impossible," said Jeff.

"You see?" said Horne with a lift of his eyebrows. "Even had I come to you with my plan you'd not have taken it seriously."

"Come to the point," said Lucille.

"We're going to cross interstellar space," said Horne.

"But that is impractical."

"Not at all," said Horne. "What I have in mind will work. I've supplies on the way. What I need now to drive them is your big superjet, Benson."

"But it is not a jet," objected Jeff. "I've been using it to investigate subspace."

HORNE smiled. "Isn't it the same kind of general layout as a jet?"

"It started off as one but—the trouble is that it's too big . . ." Jeff's voice trailed off as he became engrossed in thought.

"Look," said Horne, "for months I've been lifting ships laden with the necessities of life out of the ocean and towing them out into space. I've sent them along a course at varied velocities so that they will all converge—more or less—a few billion miles beyond Pluto in a couple of weeks!"

". . . might work . . ." muttered Jeff, still deep in thought.

Lucille stamped her foot. "Jeff! Don't trust him!"

"I dislike violence," said Horne apologetically. "But I've been forced to it. Had there been another way I'd have taken it. At any rate, with the millions of tons of supplies I have out in space waiting for use we can make it even though it takes longer than anticipated."

". . . the big jet might do the trick," mumbled Jeff. He went to the big latticework tube and turned it on. While it was warming up Jeff went to the instrument cabinet and took out a couple of pieces of observing equipment. He peered into the eyepiece of the the first and made some scrawling calculations on a pad of paper.

"It's there, all right. . ." Again his voice trailed off as he began to juggle an equation.

Lucille looked at him and frowned.

Horne continued, "We can tow the big jet out into space, collect the assortment of seagoing ships when they converge, chase the few that have wandered off because of my inability to handle space navigation—astrogation, isn't it?—and then we can tie 'em all together and drive 'em with your big jet."

". . . an idea that hadn't occurred to

me . . ." mumbled Jeff, using his slide rule for a moment.

"Jeff. Don't believe Horne!"

"This is no time for petty dislikes," said Horne to Lucille.

"Isn't it?"

"No."

"Seems to me that if all of us are to be canned up in a single shell of aluminum for half of our lives we should be able to pick congenial company."

"We are all partners in this," said Horne quietly. "I'm in it because I have the plans and have executed my part. Jeff is in it because his technical ability was and is needed to get us on the way. Similarly, you have a large part in this enterprise because you manufactured the first rocket capable of performing such a feat."

". . . needs no reworking at all," said Jeff finally.

Lucille looked at Jeff once more. Again she shook her head. Horne was completely selfish and absolutely ruthless. He had the ability to talk a victim into bankruptcy and leave him firmly convinced that Horne was still a good friend. He was a first-class confidence man with about the same level of ethics and morals.

She was in a spot. Knowing Horne as she did, Lucille felt no compunction about clipping him over the head with the file she held in her small right hand and leaving him abandoned on a doomed earth while she and Jeff took for a new future. Obviously Horne had no intention of following through with such a Noel Cowardish plan as having the three of them crossing the void to set up a new civilization on a distant planet.

It was, and she faced it squarely, a matter of whether she could murder Horne before Horne could murder Jeff.

But she could not call upon Jeff. He stood there lost in thought, twiddling his slide rule and making hentracks on a sheet of paper. It was time to forget the math he knew and apply the knowledge of human nature that was hers by heritage and experience.

YET, if she tried to convince Jeff of Horne's duplicity, he would probably take off on a long discussion of how the trip could be made. It would be her show to keep Horne from killing Jeff and to see that Jeff, not Horne, was the final male survivor of that interstellar trip.

For if she were to face a new future with either of them it would be Jeff Benson rather than Charles Horne.

Horne said, "At one gravity constant acceleration it will take two hundred and sixty-odd days to reach a velocity of three-quarters the speed of light. We have power enough, perhaps, to go higher but that will have to be computed by Benson.

"There are planets around Procyon. We must trust Moranther's Hypothesis that most stars have planets and that most planetary families will run the same gamut of characteristics as the planets of Sol."

Jeff looked up, still deep in thought. "It will do the job," he said, absently. "The big jet will do it as it is now."

Horne blinked. "No changes necessary?" he asked pointedly.

"None," said Jeff. "I am certain that the velocity of the wide-open jet will be high enough to hurl the solar-combustion products far and fast enough to be relatively safe."

He turned to the work-table and picked up a tiny model of the Roman Jet which he had been using in his investigations. He snapped the switch on the driving equipment and looked down into the open cylinder briefly.

"It's certain," he said. "And to think that I hadn't thought of it before!"

"Too late," grunted Horne.

"Huh?"

"All I wanted to hear from you was that the big Jet would do the trick," said Horne. "That's all!"

Horne slipped his hand into his side jacket pocket and it came out holding a flat, blue automatic. His left hand hit the slide, cocking it.

Lucille screamed and leaped forward, raising the file. Horne turned and snarled. The gun came halfway up but Horne had no desire to harm Lucille. A dead or crippled mate was not Horne's idea of good company for a number of years in space.

Lucille's file came around in a short vicious arc. Horne threw a punch with his left. He caught her across the face with a wicked backhand slap that turned her head and threw her off balance. Horne slid aside and let the wild swing of the file go past. Then he moved in again, catching Lucille with his shoulder and hurling her aside.

She bounced from his shoulder like a sack of meal and fell sprawling on the floor.

Horne laughed shortly as his automatic

came up to dead point in his right hand.

There was a flat bursting bark followed by a shrill screech. The room flared with an intolerable brightness as the miniature jet in Jeff Benson's hands flashed a nine-foot lance of sheer energy that drilled a one-inch hole in Horne's chest.

Horne stopped moving. He was dead from the cone of ultra-hard gamma radiation that came from the jet before the material energy could cross the gap that separated him from Benson.

He fell, unseen.

"Jeff! My eyes!"

"They'll be all right."

"But Horne—"

Jeff snorted. "You don't need eyes," he said. "Can't you smell?"

CHAPTER XVI

No Such Comet

"**B**UT I thought you trusted him."

"Why should I?"

"You sounded as though you did."

"I might have, excepting for a couple of things that did not add up."

"For instance?"

Jeff smiled. "His first mistake was in acting the part of the spokesman for a group of scientists who claimed that the Roman Jet was responsible for the nova. He forgot that I know a few scientists—enough of them so that I smelled a rat. When Jerry Woods came to me with that yarn I began to make inquires because I had evidence they were wrong. The answer pointed to Horne."

"Why did he do that?"

Jeff shrugged. "I think that he hoped to get his hands on the rocket after the riot at your place. Then, after you escaped, Horne tipped the authorities off that I was working with the stuff."

"Again—why?"

Jeff groped for cigarettes and, as the match burned, breathed a sigh of deep relief.

"I can see the flame," he said. "Another half hour or so and we can get to work. Horne wanted to get his hands on the rocket. He knew that until you felt free to return to civilization you'd hide out somewhere. He knew that I could tell the truth and convince the authorities of the facts. Doctor Logan

had the F.B.I. track down the source of that tip. They found the trail that led to Horne."

"But why didn't they do something?"

Jeff grinned, "you can't slap a man in the calaboose for telling the truth. I *was* monkeying with solar power."

"But you sounded convinced that Horne—"

"Did I? I'm sorry. I was busy thinking. Horne gave me a grand idea and I'm afraid I paid very little attention to his talk."

"But you were prepared with the little jet," said Lucille. She blinked and peered at him with unfocused eyes. "Move," she said. "All I can see is a couple of yards of bright streak and a haze of background color."

Jeff moved.

"Thanks. I'm clearing up too."

Jeff nodded. "Horne was too glib. He forgot that nature is inclined to be a nasty thing at times. You see, Lucille, nature might well permit a couple of women to share a man but the reverse is not true.

"All too often I've seen the firmest of boyhood chums become the nastiest of adult enemies because they both happened to want the same woman. If Horne had been honest in his proposition he would have provided a gal for me—or maybe himself."

Lucille looked down at the floor and screamed. "Oh!" she said. "To think that the first thing I have to see when I can see is Horne!"

"We can blame him for a lot of trouble and a very timely bit of help. Can you see?"

"A bit—well enough to navigate."

"Come on then. We've got work to do."

"What'll I do?"

Jeff smiled. "Pack. We'll waste no time."

While she was gone Jeff went to work on the equipment that furnished the force-fields for the big jet. He made cables to replace the impromptu connections that ran from one thing to another. He fastened some loose breadboardstacked circuits onto a metal panel and tested the circuit.

He packed the various cabinets and cases, stacked some of them for easy handling and bound them together with steel bands. When Lucille returned with a handbag, leading the twins, Jeff was waiting.

"You're very necessary," he grinned at her. "I don't know how to handle the rocket."

"Thanks. But Horne did it."

"Horne took time to find out. He had to.

I've a chauffeur and I'll be a very busy man." He looked down at Janey and Jimmy. "Bundle them into the ship," he said.

"Naturally. We can't leave them here."

Jeff patted Jimmy on the top of the head. "Come on, snooks," he told the child. "We're going on a little jaunt."

"To see mommy?"

"We're going to see a new star," said Lucille.

Jeff shook his head. "A new sun," he said.

Lucille stuck her tongue out at him. "Go on," she said. "Be technical."

JEFF stood in the open spacelock and called directions through the telephone as Lucille lifted the big rocket gently and cautiously on its jets. She went up and over and made a soft landing on the roof of Jeff's laboratory. The backslash burned the tar and gravel of the roof and sent up a smoking stench that blinded and choked.

Jeff tied a wet handkerchief over his face and dropped to the smouldering roof. He took a pickaxe and drove a number of holes through the surface, peering from time to time through one of the holes to be sure that the ring of holes encircled the position of the big jet and its associated equipment.

Then he dropped a number of cables from the spacecraft, the same cables used by Horne to pirate his supply of ships.

Jeff then went below and climbed into the trusses that held up the roof and cinched the cables to the roof.

Then Lucille lifted the spacecraft and the roof came off with a rending crash. Dust and debris fell into the laboratory. A beam fell to short the electrical wiring and there was an electrical flash and a sputtering arc until the fuse blew.

They dropped into the vacant lot while Jeff unleashed the cables and then once more they rose above the laboratory and dropped down through the hole in the roof until the sloping sides of the ship filled it.

There the ship hung, its bulk suspended a few feet above the monster jet. Again Jeff went into the laboratory and slung the big jet from the cables, fastening it tight against the side of the ship, pointed down.

The driving equipment was hauled into the spacelock with the small crane once used to trundle automobile engines back and forth when Jeff Benson's laboratory had been a mammoth garage. Then Jeff took a last look at the place, picked up an item or two and

entered the lock, closing it behind him.

"Up!" he said, dramatically.

The jets flared and their backslash hit the concrete floor and spread. The ends of the lances of raw energy licked at table and chair briefly before the big ship went up with its load.

By the time they were a half mile high Jeff Benson's laboratory was a roaring holocaust.

* * * * *

Jeff chucked Janey under the chin. "We're off," he told the child. "Let's go open a can of beans and make ourselves at home."

"Eat?" That was Jimmy, anticipating his most favorite pastime.

"Uh-huh," chuckled Jeff. "Eat. This is going to be a bit cramped but we had no one to leave you with."

Lucille started. "Jeff?"

"Huh?"

"But Jeff, we couldn't leave them here while we go to Procyon."

Jeff looked at her wide-eyed. "We're not going to Procyon," he said.

"Not—going—?"

"Shucks," he said, snapping his fingers in exasperation, "I must have forgotten to explain what I was thinking about when you were all stewed up over Horne. That was a bright idea."

"Do go on," replied Lucille in a pettish tone. "If we aren't going to Procyon where are we going?"

"Just out there," chuckled Jeff.

"But you said something about another sun."

"So I did."

"But—"

"So we're going to make it," said Jeff grandly.

LUCILLE sat back and scowled at Jeff. Jeff nodded thoughtfully. "It's been right in front of my nose ever since Lasson and I and Jerry Woods talked over the nova theory months ago. Right here," he said, passing a hand in front of his face. "And I'm so blind that I can't see it."

"Remember the theory? Subspace is warped because of the excesses of energy hurled into it by the solar nuclear reaction. A nova takes place when subspace is ruptured, just as a balloon will rupture when you blow it too full.

The returning energy, coming in all at once, mingles with the solar energy and the

resulting increase in temperature and pressure raises the nuclear activity to explosion levels. It's something like oxidation in chemistry.

A log of wood will oxidize slowly at room temperature. It takes years. In a fireplace, at or near the kindling temperature, the log burns swiftly. Toss the log into a vat of molten steel and it goes *puff!*"

"Get to the point."

"It's a long tale and we have a long way to go."

"But my patience isn't that long and you know it."

"Okay. What do they do to keep boilers from blowing up?"

"Put a safety valve on them."

"Correct."

"And the big jet is our safety valve?"

Jeff nodded. "We can drain the excess energy out at some spot in space where the returning energy will not interfere with Sol. Nor," he added with a half-smile, "Sol's planets."

* * * * *

"We're here," said Jeff, peering at the radar screen.

"Here?" asked Lucille.

"Horne's pirate hoard is right handy."

"Jeff, you bother me," said Lucille in an exasperated voice. "Two weeks ago you tell me we're not going to Procyon. Obviously we don't need a few millions of tons of groceries if we don't try to cross interstellar space.

"Now, after manipulating the ship around to come to a stop out here in space, you look for the stuff. Just what are we going to do—and how am I ever going to begin to understand how you think?"

"Study practical physics," he grinned.

"Have you any idea of where that jet will go if we turn it on with all the energy of a sun behind it?"

"Off in a heck of a rush," said Lucille. "But is that bad?"

"It would be. In subspace there are islands of energy clustered around the back-pressure of every sun. Once this jet gets closer to another sun than our own the energy from that other sun will be coming through. I want this little safety valve to remain as Sol's own. We need the grand mass of that junk to hold the jet down."

"Okay. But it'll still move."

"Right, Miss Galileo. It will still move. But with enough mass I can make it circle by setting the angle of the jet. Then it'll stay in the near neighborhood."

It took several days to collect the ships. Horne had done a good job of sending the later ships faster than the earlier ones and along the same course towards Procyon. Their own mass, inconsiderable as celestial masses go, had been of only minute benefit in mutual attraction to keep them together.

But it had helped and once the grinding, bumping group of ships had been trussed together by cable and chain, with the spacecraft acting as tender, space-tug and donkey-engine, Jeff was ready.

By remote control he opened the jet.

It flashed once and then a cylindrical tongue of blazing energy started to extend from the maw of the great jet. It moved with apparent slowness out from the mass of chained ships, from where Jeff and Lucille watched—but they knew that the jet was punching out at speed very close to the velocity of light. For minutes it jetted out, ever extending, always in a straight line.

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Then it curved as the moving mass turned and the searing tongue of flame became sickle-shaped as it cut a swathe through space. The distant end of the tongue dispersed and spread in a cooling cloud of gas that ran down through the spectrum and vanished.

The spearhead came around in a vast arc, resembling a comet.

BUT no such comet was ever seen before. It seared the eyeballs as it curved its way across the sky. It seemed to move ponderously but it was only vast distance that made the illusion of slowness.

The head of the arc made its first complete circle and cut back through its own trail.

Light burst from the hot center of the trail and the trail bulged. Then, from within it confines, emerged vast licking, darting lances of sheer energy. Like a fast-growing cauliflower of blinding brightness, space ruptured where the jet had crossed its own trail and the pent-up energy of Sol came roaring through the breach.

.. "Get!" yelled Jeff.

"What is it?" cried Lucille.

"Just get—and hope we can outrun that explosion."

The rocket turned and the jets flared into the back sky.

"But what is it?"

"I think the thing turned into its own trail, burned the barriers down and opened the whole aperture—sort of like having the stopcock blow out of a high pressure tank."

"But what will happen?"

"I was kidding about making another sun. But time will tell. Maybe in a few years that thing will have expanded to a size large enough to make a Sol a double star."

"But the nova?"

"It's finished. Kaput. We can go home now and settle down." Jeff looked thoughtful. "You know," he said after a moment. "I wonder whether all of the double stars in the universe were created by sentient beings

who have discovered the secret of subspace."

"That's not too important," said Lucille.

"This thing is bigger than that."

"What is?"

"Why, don't you realize? You've averted a solar nova and saved the Earth."

"Oh, yes. Glad to do it," chuckled Jeff.

"Now we can go back home and return to our daily lives without worrying about having the sun blow up in our faces."

"That is a fine idea. It's been a long time. And the poor people who threw everything overboard because there was no future?"

"You, for instance. Going to carve yourself another financial empire?"

Lucille shook her head.

"I've proved I can do that," she said quietly. "I've a more interesting problem at the moment."

"What?"

"Why, I've got to see whether running a family is more or less difficult than running a corporation."

"Family," chuckled Jeff, looking at the twins. "We've got a couple of kids to take care of, haven't we?"

Lucille leaned against him softly. "Make an honest woman of me, Jeff," she said dreamily. "I think we'll be starting our family with three."

Jeff looked out of the windowport at the exploding sphere of glinting light and the racing rod of energy, then out of the other port at Sol. Somehow Sol seemed less angry already although it was impossible to tell from this distance or at this short interval. At any rate, there would be no nova.

Then he looked down at Lucille. She snuggled down cozily, happy and content with the gnawing fear gone.

The sun's trouble was over but Jeff wondered just how long Lucille could remain content. He shrugged. If he could manipulate the solar system he ought to be able to manage a woman.

It would be interesting to find out just how wrong he was.