MARCH 1936

ASTOUNDING STORIES

20¢

ENTROPY

by

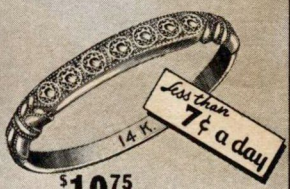
NAT SCHACHNER

I mean it! for only $1.00 DOWN

I'll send you any of these PERSONALLY SELECTED Sensational VALUES

ONLY $21.95 **$2.10 a month**

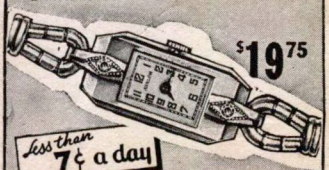
KD-1 . . . Smart, brand new creation in 14K Solid White Gold or Yellow Gold. Square prong engagement ring at an amazingly low price! Set with a specially selected dazzling, genuine blue-white diamond. (Specify White or Yellow Gold.) *Only* $2.10 *a month*



Only $19.75 **$1.87 a Month**

7 GENUINE DIAMONDS

KD-5 . . . Featuring 7 expertly matched, fiery, genuine diamonds in a wedding ring of stunning beauty. Elegantly hand engraved, 14K Solid White Gold or Yellow Gold—specify your choice. A very special JUBILEE VALUE at $19.75. *Only* $1.87 *a month.*



$19.75

SET WITH 2 GENUINE DIAMONDS

Only $1.87 a month

KD-12 . . . One of the greatest wrist watch values of our entire career! Elegantly streamlined, ladies' Baguette wrist watch set with 2 fiery, genuine Diamonds; exquisite white case; guaranteed dependable movement. Smart, new tubular link bracelet to match. *Only* $1.87 *a mo.*

A FEW CENTS A DAY Pays Balance

Here are SEVEN sensational feature values personally selected for their exquisite styling, their amazing value and nationwide popularity. They are offered to you on ROYAL'S most liberal credit terms . . . ROYAL'S challenge to cash or credit jewelers anywhere!

Examine these beautiful rings and fine standard watches now! Where else but at ROYAL could you hope to find such Style—Quality—Value? No wonder that ROYAL is *"America's Largest Mail Order Credit Jeweler!"* And

YOU DON'T NEED CASH TAKE 10 MONTHS TO PAY

It's true! All I ask you to send is $1.00 deposit. Tell me which article you wish and in strict confidence mention a few facts about yourself. Age, occupation, etc. No direct inquiries will be made—your dealings will be treated as a STRICTLY CONFIDENTIAL matter. If you've had credit accounts I'd appreciate your mentioning them BUT it's not essential at all. Your order will be given my prompt attention and shipped FULLY PREPAID—**No C. O. D. to pay.**

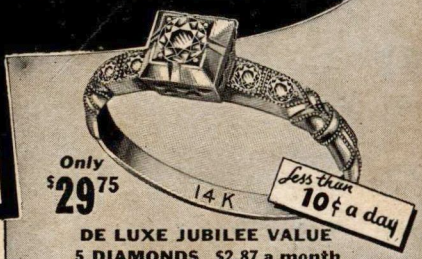
TEN DAYS TRIAL CONVINCE YOURSELF

If you can surpass these sensational Values anywhere, return your selection and WE WILL PROMPTLY REFUND YOUR ENTIRE DEPOSIT. If fully satisfied after trial period, pay only a few cents a day in 10 EASY MONTHLY PAYMENTS. You can't beat that!

WRITTEN GUARANTEE WITH EVERY ARTICLE

Every ring, every watch is sold with Royal's written guarantee, backed by our 41 year reputation for fair and square dealings. Take advantage of these amazing values now. Send your order TODAY!

Sales Promotion Mgr. Al Green

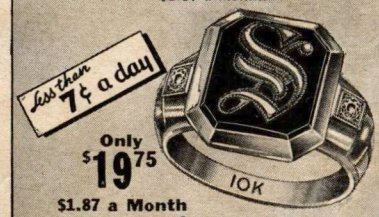


Only $29.75

DE LUXE JUBILEE VALUE

5 DIAMONDS $2.87 a month

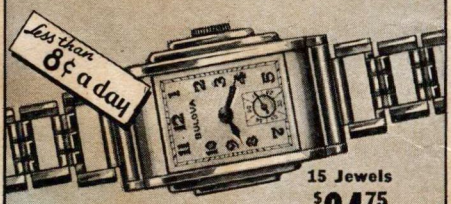
KD-3 . . . A most beautiful and popular, square prong engagement ring of 14K Solid White Gold set with a certified genuine blue-white center diamond of unusual brilliance and 2 matched fiery diamonds on each side. An extraordinary JUBILEE VALUE at only **$29.75.** $2.87 *a month.*



Only $19.75 **$1.87 a Month**

2 GENUINE DIAMONDS

KD-7 . . . Gentlemen's distinctive initial ring of 10K Solid Yellow Gold set with 2 fiery genuine diamonds on the sides and a solid white gold raised initial on genuine onyx. Specify initial desired. *Only* $1.87 *a month.*



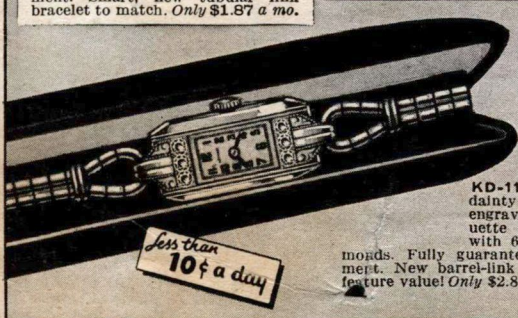
15 Jewels

The* BULOVA *Senator

$24.75

$2.38 a Month

KD-10 . . . The aristocrat of Bulova gent's wrist watches at Bulova's lowest price. Distinctively designed Bulova quality white chromium finished case. 15 Jewel B-U-L-O-V-A movement. Doubly guaranteed to give a lifetime of dependable service. Link bracelet to match. $2.38 *a month.*



$29.75

***6 Diamond* BAGUETTE WRIST WATCH**

Only $2.88 a month

KD-11 . . . The last word in dainty elegance! Exquisitely engraved, slenderized Baguette Wrist Watch adorned with 6 brilliant genuine diamonds. Fully guaranteed dependable movement. New barrel-link bracelet to match. A feature value! *Only* $2.88 *a month.*

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Featuring hundreds of money saving specials in certified first quality genuine diamonds, standard watches, fine modern jewelry and silverware offered on ROYAL'S liberal TEN PAYMENT PLAN. Adults: Send for your copy today.

America's Largest Mail Order Credit Jewelers

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VOLUME XVII
Number 1

ASTOUNDING STORIES

MARCH
1936

A STREET & SMITH PUBLICATION

Table of Contents

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I'LL SEND MY FIRST LESSON FREE

It shows how EASY *it is to learn at home to fill a*

GOOD JOB IN RADIO

J. E. SMITH, President, National Radio Institute. The man who has directed the Home-Study Training of more men for the Radio industry than any other man in America.

Clip the coupon and mail it. I will prove to you that I can train you at home in your spare time to be a RADIO EXPERT. I will send you my first lesson FREE. Examine it, read it, see how clear and easy it is to understand. Then you will know why many men with less than a grammar school education and no technical experience have become Radio Experts and are earning more money than ever before as a result of my training.

MANY RADIO EXPERTS MAKE $30, $50, $75 A WEEK

In about 15 years, the Radio Industry has grown to a billion dollar industry. Over 300,000 jobs have been created by this growth, and thousands more will be created by its continued development. Many men and young men with the right training—the kind of training I give you in the N. R. I. Course—have stepped into Radio and quickly increased their earnings.

GET READY NOW FOR JOBS LIKE THESE

Broadcasting stations use engineers, operators, station managers and pay up to $5,000 a year. Manufacturers continually employ testers, inspectors, foremen, engineers, servicemen, buyers, for jobs paying up to $6,000 a year. Radio operators on ships enjoy life, see the world, with board and lodging free, and get good pay besides. Dealers and jobbers employ servicemen, salesmen, buyers, managers, and pay up to $75 a week. My book tells you about these and many other interesting opportunities to make more money in Radio.

MANY MAKE $5, $10, $15 A WEEK EXTRA IN SPARE TIME WHILE LEARNING

The day you enroll I start sending you Extra Money Job Sheets which quickly show you how to do Radio repair jobs common in most every neighborhood. Throughout your training, I send you information for servicing popular makes of sets! I give you plans and ideas that have made good spare time money for hundreds of fellows. My Training is famous as "the Course that pays for itself."

TELEVISION, SHORT WAVE, LOUD SPEAKER SYSTEMS INCLUDED

There's opportunity for you in Radio. Its future is certain. Short wave, loud speaker systems, police Radio, automobile Radio, aviation Radio—in every branch, developments and improvements are taking place. Here is a real future for men who really know Radio—men with N. R. I. training. Act now to get the training that opens the road to good pay and success.

YOU GET A MONEY BACK AGREEMENT

I am so sure that N. R. I. can train you satisfactorily that I will agree in writing to refund every penny of your tuition if you are not satisfied with my Lesson and Instruction Service upon graduation.

FREE 64-PAGE BOOK OF FACTS

Mail the coupon now. In addition to the sample lesson, I send my book, "Rich Rewards in Radio." It tells you about the opportunities in Radio, tells you about my Course, what others who have taken it are doing and earning. This offer is free to any ambitious fellow over 15 years old. Find out what Radio offers you without slightest obligation. ACT NOW! Mail coupon in an envelope, or paste on a 1c post card.

J. E. SMITH, President
National Radio Institute, Dept. 6BD,
Washington, D. C.

The Tested Way to BETTER PAY

Here's Proof

$1,000 A YEAR WHILE LEARNING

"During the course of my training, my spare time earnings from sales and service netted me an average of $1,000 to $1,500 yearly. For about two years, while other work was practically out, I cashed in nicely on Radio."

JAMES R. RITZ,
3525 Chapline St.,
Wheeling, W. Va.

$5,000 ON REPAIR WORK ALONE

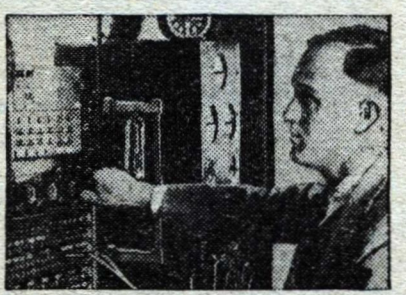
"I am doing around a $5,000.00 business in repair work alone, not counting the new Philco Radio sales."

C. D. THOMPSON,
R. F. D. 2,
Troy, Alabama.

DOES POLICE RADIO WORK

"I am doing the work on the Radio cars of the Police Department of West Seneca township. This is not a full-time job, but averages about $25 a week. Besides this I am working as assistant manager in a local Radio store and average $20 a week on this job. I say, 'take the N.R.I. Course—it is the best.'"

J. M. TICKNOR,
11 Edson Street,
Buffalo, N. Y.



You Get PRACTICAL EXPERIENCE with Radio Equipment I GIVE YOU

I'll show you how to use my special Radio Equipment for conducting experiments and building circuits which illustrate important principles used in such well-known sets as Westinghouse, General Electric, Philco, R. C. A. Victor, Atwater-Kent and others. You work out with your own hands many of the things you read in my lesson books. This 50-50 method of training makes learning at home easy, interesting, fascinating, intensely practical. You learn how sets work, why they work, how to make them work when they are out of order. Training like this shows up in your pay envelope—when you graduate you have had training and experience—you're not simply looking for a job where you can get experience.

I have helped hundreds of men make more money

MAIL THIS NOW!

J. E. SMITH, President
National Radio Institute, Dept. 6BD,
Washington, D. C.

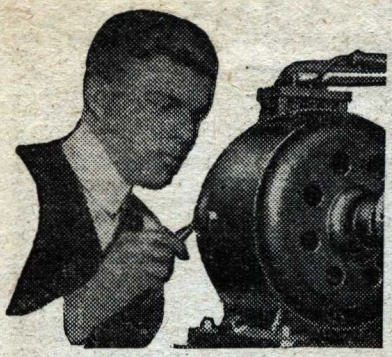
I want to take advantage of your offer. Without obligating me, send me your Free Sample Lesson and your book, "Rich Rewards in Radio."

(Please Write Plainly)

NAME..... AGE.....

ADDRESS.....

CITY..... STATE..... "R"



AMAZING EASY WAY TO LIFE-SUCCESS in ELECTRICITY

LEARN THE GREATEST INDUSTRY OF THE AGE—TRAIN NOW FOR A BIG-PAY JOB

I'll Finance Your Training!

Are you dissatisfied with your job? Are you out of a job because you lack **specialized training** for a **live** industry? Is your future uncertain? Then let me show you an amazing, easy way to get into Electricity, where TRAINED MEN are needed . . . Where hundreds of Coyne Graduates are drawing Good Pay every week. Coyne has been training ambitious fellows for the Electrical Industry since 1899 . . . **at Coyne you do not need previous experience or a lot of book learning.**

Many Make $30, $40, $50 and Up, Every Week

Here is YOUR life opportunity. Every day brings news of new developments in this fascinating, big-pay field, with more jobs and a greater future for the trained man than ever before. If you are ambitious to get ahead, I want to help you. MAIL THE COUPON BELOW and **I'll tell you about my finance plan, which has enabled thousands to get Coyne Training with very little money.** Get training **first,** then take **18 months** to complete small monthly tuition payments starting FIVE MONTHS after you begin your training, or 2 months after your required training period is over.

H. C. Lewis

Learn By Doing In 90 Days

The great Coyne Shops are famous the world over for their unusual **Learn-by-Doing** method of practical, individual instruction. There is no book study, no reciting—you learn quickly and thoroughly by doing actual jobs under the personal guidance of trained instructors, on a great outlay of machinery and equipment assembled strictly for training purposes. That is why, in 12 short weeks, we are able to take fellows **without previous experience or a lot of book learning,** and train them for jobs leading to good pay.

MANY EARN WHILE LEARNING

If you need part-time work to help pay living expenses while at school, tell us your problems and we may be able to help you as we have hundreds of other students. Then, after you graduate, our Free Employment Department will give you life-time employment service. Every Coyne graduate also receives a Life Scholarship, with free technical and business service and privilege of review at any time without additional tuition charge.

LEARN ELECTRICITY

Prepare for jobs like these:
DIESEL OPERATOR
ARMATURE EXPERT
SUBSTATION OPERATOR
AUTO ELECTRICIAN
INVENTOR
MAINTENANCE ENGINEER
SERVICE STATION OWNER

and many other money-making opportunities in the Electrical field. Learn by actual work on real dynamos, engines, power plants, autos, switchboards — everything from door bells to full-sized power and lighting plants, in full operation every day.

DIESEL ENGINES **Electric Refrigeration . . . Air Conditioning**

Trained men are needed in these rapidly expanding fields—the fastest growing industries in America today. Right now I'm including instruction in **Diesel Engines,** Electric Refrigeration and Air Conditioning **at no extra cost.**

HOME OF COYNE SCHOOL

This is our fireproof modern home wherein is installed thousands of dollars worth of Electrical equipment. Every comfort and convenience has been arranged to make you happy and contented during your training.

H. C. LEWIS, PRESIDENT — FOUNDED 1899

COYNE ELECTRICAL SCHOOL

500 S. Paulina St., Dept. 26-45, Chicago, Ill.

JOBS · PAY · FUTURE

"I owe my electrical success to your 12-week shop course," says R. B. Umbarger of Tennessee. "Two weeks after leaving school I took a wiring job," reports E. O. Berndt of Illinois, "and the profits from this one job alone more than paid for the entire course." A. C. Hoehnle of Ohio says "Received several raises in pay, due to the training I received at Coyne." And I could quote from hundreds of similar letters from successful Coyne-trained men. **What they have done, you should be able to do!**

GET THE FACTS... NOW

Coyne is your one great chance to get into this big-pay field. This school is 37 years old . . . Coyne training is tested . . . endorsed by many large concerns. And it costs you nothing to find out about this amazingly easy, practical way to life success. Simply mail the coupon below and I'll send you the big, free Coyne book, with photographs, facts, jobs, salaries, opportunities. There's no obligation, so act at once.

Send TODAY for this FREE BOOK!

H. C. LEWIS, President
Coyne Electrical School, Dept. 26-45
500 S. Paulina St., Chicago, Ill.

Without obligating me, send full details of your **"Pay-Tuition-After-Graduation"** Plan and Big Free Illustrated Catalog.

Name.....*Age*.....

Address.....

City.....*State*.....

The Story of 2 MEN who NEEDED CASH

DO YOU need money to pay the rent—to meet nagging bills—or to clothe and feed the family? Are you hard up for ready cash and obliged to deny yourself many comforts or even necessities? Are you working for such small wages that you can't make ends meet? Then you will be interested in the experiences of these two men.

THIS MAN DOUBTED:

He said: "Yes, I am broke. I am really terribly hard up. I haven't a cent of extra money for anything. I wish I knew where to get some. I haven't a bit of faith in anything. I am a failure and my luck is terrible."

THIS MAN ACTED:

He said: "Yes, I need money. I am tired of penny pinching. Your generous offer sounds good to me. It costs nothing to investigate—I have everything to gain. I am going to send my name and find out just what you have to offer me."

RUN A LOCAL COFFEE AGENCY

Wonderful Opportunity to make $60.00 in a week

I'll help you start at once and back you up to the limit. Here's a bona fide cash-getting idea you may never have heard of before—a unique and utterly different way of getting the cash you need. With my plans I have "saved the day" for hundreds who were at their wits' end. Not just another clock punching job . . . no back-breaking labor. Even spare time nets up to $5.00 in a day . . . full time up to $60.00 in a week. Good opportunities open. You don't require any previous experience and you don't risk any of your own money. Think of being prosperous again. Just send me your name for free facts.

Have Big Weekly Cash Earnings

If you are tired of slaving for small pay, here's your chance to break away and make big money. You can even start in your spare time—see the business grow—have cash in your pocket—be independent. Think of the joy of being a successful business person in your own locality with big, year 'round earnings of your own. You don't have the usual money risks of a business man. There is no limit to your possibilities. Earnings begin at once, the very first day.

LOOK AT THESE UNUSUAL EARNINGS

I have a flood of glowing letters from prosperous, successful men and women telling of unusual earnings they have made with my plans. L. P. Boyne, La., made $67.20 in a week. Mrs. H. H. Hosick, Nebr., made $41.75 the first week. Steve Witt, Mo., made $21.59 in a day. Albert Becker, Mich., $100.00 in a week. George W. Creed, Ohio, $95.00 in a week. Exceptional earnings like these are positive proof of the amazing earning possibilities of my offer.

STARTED PENNILESS

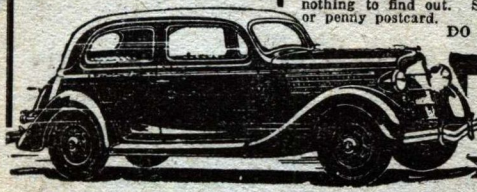
6½ Months Later Was Worth $1,200

"Only six and a half months ago I started with your company without a penny to my name, and today (I just finished my balance) I am worth a little more than $1,200.00. I can hardly believe it myself—such a success in so short a time! But it's the truth. Many a day I made from $15.00 to $20.00 clear profit. Your Happy Hustler, Hans Coordes, Nebr.

SEND NO MONEY—SEND NAME

I send everything you need. You positively don't risk a penny of your money. There is nothing complicated or puzzling about my money-making methods. You will be the judge and decide for yourself if the earning possibilities are satisfactory. Just give me a chance to explain the facts. It costs you nothing to find out. Send name on coupon or penny postcard.

DO IT NOW!



NEW FORDS Given as a Bonus

A FEW WEEKS LATER

Now look at these two men as they meet on the street. One is a success and the other is a failure. One had the courage to try; the other had no faith—he was a doubter—he is still in hard luck. The man in the car is a success because he was willing to listen to reason. He was not afraid to send in his name and get the facts. When he saw my public announcement stating I would give a brand new Ford Tudor Sedan to producers as a bonus in addition to cash earnings, he believed in my sincerity. Why don't you, too investigate?

TEAR OUT—MAIL NOW

Albert Mills, President
1598 Monmouth Ave.
Cincinnati, Ohio

Rush me free facts. Tell me how I can start at once and make up to $60.00 in a week with a permanent Coffee Agency of my own. Also send me your Ford Automobile offer. This will not obligate me.

Name.....

Address.....

.....

(Please Print or Write Plainly)

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DETECTIVES EARN BIG MONEY. Work home or travel. DETECTIVE particulars free. Experience unnecessary. Write, GEORGE WAGONER, 2640-A Broadway, New York.

Patents Secured

PATENTS—Reasonable terms. Book and advice free. L. F. Randolph, Dept. 513, Washington, D. C.

PATENTS SECURED. Two valuable booklets sent free. Write immediately: Victor J. Evans & Co., 811-C, Victor Building, Washington, D. C.

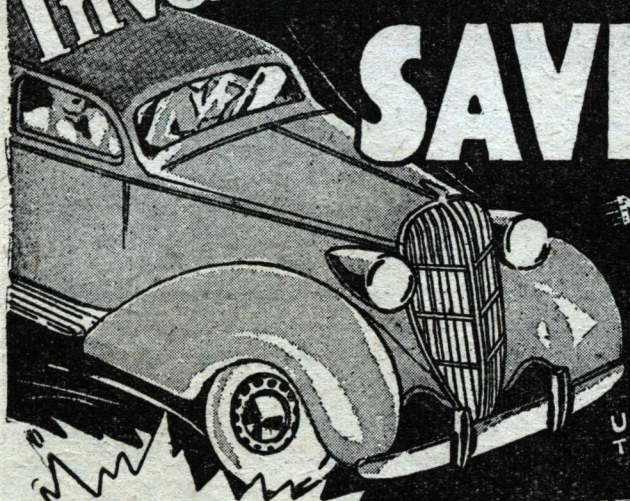
Agents Wanted

AGENTS: Smash go prices. Santos Coffee 12c lb. 4-oz. Vanilla 8½c. Razor Blades 10 for 8½c. 100 sticks Chewing Gum 12c. 150 other bargains. Experience unnecessary. Write Carnation Co., SR, St. Louis, Mo.

Old Money Wanted

OLD MONEY WANTED. Will pay $100.00 for 1894 Dime, S. Mint, $50.00 for 1913 Liberty Head Nickel (not Buffalo). Big premiums paid for all rare coins. Send 4c for Large Coin Folder. May mean much profit to you. B. Max Mehl, 440 Mehl Bldg., Fort Worth, Texas.

New Invention! WITH SUPER CHARGER PRINCIPLE SAVES GAS



MORE SPEED
MORE POWER
NEW MOTOR LIFE
QUICKER STARTING
UP TO 30% GAS SAVINGS

USERS REPORT 3 TO 7 MILES MORE PER GALLON

MOTORIST SAVES $180 A YEAR

"On an International truck on a round trip to Cleveland, 385 miles, it saved 19 gallons of gas."—*James Besley, N. Y.*

"On my V-8 Ford, it works miracles. Its added power, acceleration and top speed has sold me. The results are unbelievable."—*Ralph Fields, Mass.*

"Very glad to say, the Buick showed an increase of 5 miles more per gallon."—*A. V. Grove, Washington.*

"On my Plymouth, I obtained an average of 22 miles per gallon, an increase of 7 miles. This means a saving of $15 a month or $180 a year."—*F. S. Peck, Calif.*

"It saves me one gallon a day. I had to buy 5 gallons each day—now only 4 gallons."—*L. V. Sweet, Pa.*

"My Chevrolet certainly runs smoother, has more power and snap to it since I put the Vacu-Matic on."—*J. H. Nelson, Minn.*

"On my Dodge 8 I am getting 6 more miles per gal., with more power and pick-up, which is all anyone could ask."—*Lee D. Esty, Calif.*

"I have twelve Vacu-matics on cars now, and they all show an increase in mileage. The car owners are very well pleased."—*Fred Taylor, Okla.*

"I averaged 25 miles per gallon on a trip with a model A Ford at 40 miles per hour, where before I only averaged 20. Also better pickup and smoother running.—*Wm. Lyons, Calif.*

"I have been placing Vacu-matics on expert mechanics' cars. All are well pleased."—*J. W. Donahue, W. Va.*

VACU-MATIC

the Carburetor Control that "BREATHES"

PATENT PENDING

AT LAST! Automotive engineers have smashed down the barriers to perfected combustion! The new VACU-MATIC solves the secret of greater power! With almost magical action, this amazing invention instantly puts new life and pep in any motor. It adds mileage to every gallon of gasoline . . . produces split-second pick-up, sensitive accelerator response, quicker starting, greater speed and smoother running.

Automatic — Nothing Like It!

The self-starter—four wheel brakes—knee action—stream-lining . . . and now VACU-MATIC! The sensational money-saving invention! With it, engineers have achieved a practical means of balancing air and gasoline automatically for all speeds.

Vacu-matic is *entirely different!* It operates on the super charger principle by automatically adding a charge of extra oxygen, drawn free from the outer air, into the heart of the gas mixture. It is entirely AUTOMATIC and allows the motor to "breathe" at the correct time, opening and closing automatically as required. No idling troubles—no carburetor adjustments necessary. It is so simple it will amaze you—so practical it will save you many dollars on gas costs.

Guaranteed Gas Savings

VACU-MATIC proves itself on every car. It is guaranteed to give worthwhile gas savings, quicker pick-up, and more power or it costs you nothing. You can instantly tell the difference in added power and motor performance — you quickly notice the cash savings on gasoline.

Fits All Cars

VACU-MATIC is constructed of six parts, assembled and fused into one unit, correctly adjusted and *sealed at the factory*. Nothing to regulate. Any motorist can attach VACU-MATIC in ten minutes. Once in, its only reminder is the surge of instant power and speed it gives to the motor and the savings it affords your pocketbook.

Free Details

You owe it to yourself to know all about this remarkable discovery. Mail the coupon below. Start saving gas with VACU-MATIC and enjoy a new driving thrill! There's no obligation—so get the facts now! Write today!

Agents and Salesmen

VACU-MATIC offers a splendid opportunity for unusual sales and profits. Every car, truck, tractor and motorcycle owner a prospect. Valuable territories now being assigned. Check and mail coupon.

The VACU-MATIC Co. **Wauwatosa, Wis.**

—FREE OFFER COUPON—

THE VACU-MATIC COMPANY
7617-153 W. State St., Wauwatosa, Wis.

Gentlemen: Please send me full particulars concerning the Vacu-matic and details of your Free Offer. This of course does not obligate me in any way.

Name .....

Address .....

City ..... State .....

☐ Check here if interested in selling proposition.

Kidney Acidity Curbed Quickly This Easy Way

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Cleans Out Acids and Poisons—Purifies Blood—Brings New Energy in 48 Hours

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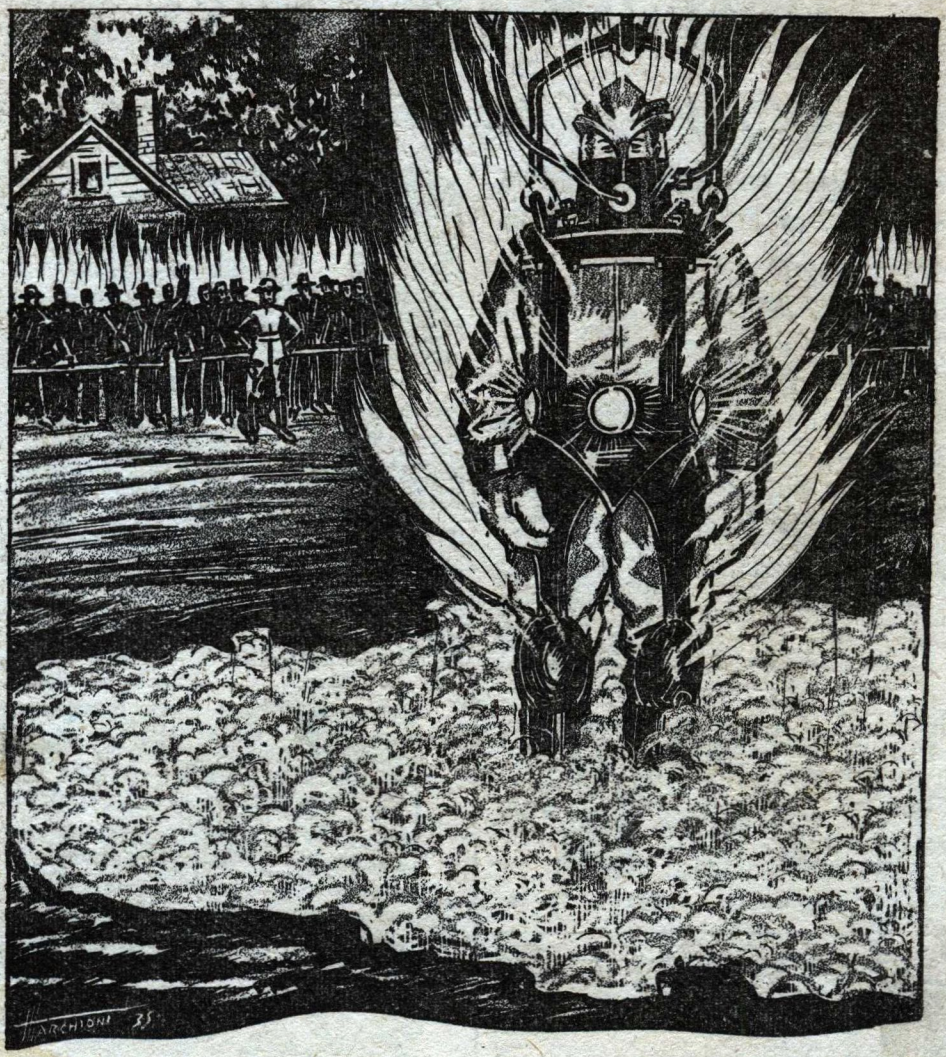


THOMAS TRAVEN saw the cold night sky beyond the window burst into blue and orange flame. The tables in the laboratory were violently shaken, a framed lithograph of Michael Faraday crashed to the floor, and the electricity ceased to function, leaving him in nearly total darkness.

He stood by the window staring in awe and amazement at the celestial fanfare. Streamers of livid light spiraled from the housetops, telegraph poles and the outflung arms of elms and cedars and cut through the great, jagged firebursts that blotted out the Constellation Cassiopeia, the polestar, and the bright, full moon.

Young Traven was unafraid. If this was the end, he was ready, eager even. It simply didn't matter. Nothing mattered any more. If the heavens burst into fire, if the solar disk cooled or be-

BLOT

A novelette of cosmic force

by Frank Belknap Long, Jr.

The girl watched him closely—fearfully as he disappeared into the roaring, bubbling surface——

came a Nova, and the fever called living ceased to rack and torment him he would pass without fear into the darkness.

It was the little cinder sun, of course. The astronomers had predicted its advent, had charted its undeviating and ominous approach to the solar system across black gulfs of intragalactic space. It was still many billions of miles from the solar hub, still far out in space, but it was approaching Pluto's orbit at a fearful speed and two eminent British astrophysicists had predicted that its inert mass would tug at the solar prominences within the lifetimes of living men.

It was a rash prophecy and an appalled world had rejected it with vigor. It had turned to the more comfortable predictions of the learned societies and academies of science which were in nearly universal accord.

It was the consensus of learned opinion that there would be no dire solar disturbances within the lifetimes of living men's grandchildren, and perhaps for hundreds of years. So emphatic were these assurances that the man in the street accepted them as historical absolutes.

The Wellsian dream of men like gods who would inhabit the planet for millions of years and grow continuously in wisdom and strength was demolished forever, but men went about their accustomed tasks with hardly a thought for the frightful solar upheavals which would eventually blast and wither the heirs of the ages and every animal and vegetable form on Earth's crust.

Like gnats spinning and gyrating in warm sunlight they labored and played and danced unheeding. Some day the waves of the friendly, warm glow would shorten, suddenly and terribly perhaps, and then—"Cornelia's dust would mix with Magdalene, and Gotama with Nero would grow green." But, meanwhile, the fact that calm and not apprehension pervaded the world while the little cinder sun was roaring through black space gulfs toward the solar orb exploded all human pretensions to concern for the future welfare of the race.

The little cinder sun was far out in space. Here on Earth were moonlight and roses, soft cheeks and tingling song. It was the height of folly to project one's thoughts far ahead into a hideous future, to even consider the dismal otherwhere, while life was so rich and sweet and warm. The miracle of love alone was a sufficient recompense.

The miracle of love! Thomas Traven stared at the flaming sky, stared at the glowing ribbons of white fire that streamed outward from the crooked chimney pots on the roofs of the old houses opposite the East Lake Institute and smiled grimly and bitterly. His face was pinched, bloodless.

ROMANCE had flamed for him and then—had died. He had killed it, wilfully and ruthlessly. He had not told her why. A mile from the institute, where young Traven did experimental work in molecular physics, Vera Branch was perhaps now watching the strange and ominous illumination from a cottage window, wondering if the end had come, sharing his wonder and amazement, but not his eagerness. She would not welcome death. She was not tired of the grim ordeal of living, not racked with pain. She would even forget him in time. The immense hurt would heal, and she would forget him completely.

It was amusing that the two British astrophysicists had been right after all—especially amusing to a young chap with radium in his bones, who had been given two months by the best doctors, and promised more pain than he could gamely bear—grimly and tragically amusing, perhaps, but certainly on the ironic side of the ledger. It was nothing to weep over, at any rate.

Turning from the window he walked across the dark room, wrenched open a sliding door and emerged into a long dark corridor. He advanced swiftly along the passageway, stopping once to listen as a slight tremor seemed to shake the building. Thirty feet from the door of his private laboratory he halted again, pressed a button in the wall and another panel slid open.

Dr. Worden's laboratory was illumined by an immense blue bulb of high voltage which jutted from a wall socket near the window. Traven repressed an exclamation of amazement when his eyes rested upon it.

"Hello there," said Worden. "Lights went off for a minute, but I was scraping down a collodion cylinder and went right on working in the dark. What do you suppose happened?"

Traven looked at the large, friendly face of the elderly physicist and at the

littered, zinc-topped table over which he was leaning. Here was a great wonder. This man, in his Archimedean detachment, was actually unaware that blinding flames were sweeping Earth's skies, that the solar disk was responding in unmistakable fashion to the gravity tug of a burned-out star, far out in space.

There was some slight excuse for him perhaps. The light failure had been momentary, and there were drawn shades on all the laboratory windows. But hadn't he even noticed the Earth tremors, hadn't he sensed a kind of tension in the air? Traven's face alone would have startled an ordinary man, with its curious look of mingled awe and grim acceptance.

Traven smiled crookedly, spoke calmly enough. "I'm afraid it's the end, doctor," he said. "We all thought Stillman and Weed were alarmists, but it looks now as though they were right. We may as well put away our little toys. Put them away, doctor. Go to the window and look out."

Dr. Worden was a man of swift intuition. Despite his detachment, he sensed the imminence of some frightful catastrophe. His face went white.

"Stillman and Weed! You mean, the tug has come? The first tug? Are you sure, Tom?"

"Pull up the shade and see for yourself," said Traven. "The sky is an immense pinwheel of pulsing light. All the trees in the street outside, all the houses are bathed in radiance."

II.

BEYOND the window the cold night sky shone frostily above the immense trees which lined the opposite block. Etched in sharp silhouette against the far-flung constellations the chimney pots of the red-brick Georgian houses stood forth innocent of change. No lights spiraled skyward from the uneven roof tops, and the telegraph poles loomed black and stark under a full, bright moon. Cassiopeia and Polaris had returned to their wonted positions in the heavens, and under Cancer and the Virgin the long length of Hydra sprawled at glittering ease.

Worden stood for an instant staring skyward. Beneath his thin alpaca coat the muscles of his broad back seemed to twitch a little. Then he swore lustily, and turned from the window. There was an angry light in his eyes when he approached the table. Without uttering a word he picked up the collodion cylinder and began calmly to examine it. A slow angry flush crept up his cheeks to his temples.

Traven stared. "You're taking it pretty calmly," he said.

Worden remained silent. Traven frowned and crossed to the window. He was also a man of swift intuition. When he saw that the heavens were bright and still again a great wonder and shame engulfed him. Old Worden would never forgive him for this. Kindly and tolerant beyond the average, the old man was yet a stickler for dignity. He would hold Traven guilty of deliberate leg-pulling, a more deadly affront than a slap in the face delivered in the heat of anger.

Traven approached the table and laid his hand on the other's shoulder. "A moment ago the sky was in flames," he said. "I saw it, sir. I thought, of course, that it meant——"

"Go away, leave me," said Worden. His voice was thick.

"But I really saw it, doctor. It was an infernal spectacle, a holocaust. I thought that fire was about to envelop the Earth, that we would all perish. Weed predicted that we could not survive the first definite tug."

"You saw nothing," rasped Worden. "You lied to me, you young——"

The sudden buzzing of a telephone on a table in one corner of the labora-

tory arrested the flow of the physicist's invective. With an angry jerk he freed his shoulder from Traven's clasp, and strode across the room.

Snatching the receiver from the hook, he pressed it against his ear. "Hello, hello," he rasped. "What is that? I can't hear you."

Traven could almost hear the excited gentleman at the other end of the wire from where he was standing. He thought he caught the words "fire," "fall," and "danger." In sudden apprehension he moved to Worden's side, cursing the latter's deafness, and the angry mood which heightened it.

"Perhaps you'd better let me take it," said Traven.

The elderly physicist scowled faintly, shook his head. Curiously enough, the anger seemed to be leaving his features.

"Here in town, you say? Good heavens! You mean to say you think . . . Then Stillman's theory. . . . Yes, yes, I understand. You want our advice. Of course, we'll come, bring instruments. . . . A kind of bombardment, you say? . . . Particles from a bolide would do that, would cut a swath in the Earth. The bubbling and roaring is puzzling, of course, but perhaps it will subside. . . . Frightening? Yes, I know, but look here, Will, it can't be anything serious or it would—spread. We'll be right over, Will."

Worden replaced the receiver and turned a white face toward his associate.

"That's Will Frome," he said. "He doesn't believe it's the end. There has been a tug, but the seismograph in his office recorded only a mild shock of intensity five on the Rossi-Forrel scale. That proves there wasn't much of an Earth tremor.

"He thinks it's a Stillman drag—the first of the infinitely tenuous pulls at the highest of the solar prominences. You're familiar with Stillman's theories, of course. He predicted that the first violent wrench would occur in perhaps twenty-five years, but that there would be faint intimations before that."

"I know," said Traven. "He predicted minute disturbances at spaced intervals of a few weeks or months—little tuggings at the solar incandescence when the great inert mass of the cinder sun reached a certain point in the sky. Weed thought the first drag would be cataclysmic. Frome thinks Stillman was right, eh?"

Worden nodded. "Yes. Frome's used all means at his disposal for checking up. Hasn't had more than a few minutes, but he thinks the disturbance is over. That isn't what frightened him. Something fell from the sky."

"Where?" asked Traven.

"In a vacant lot on Grove Street, about two blocks from the observatory. The villagers are going mad. They think it's the end of the world. It seems there's a great circular pit in the center of the lot, and its in horrible commotion, bubbling, roaring—like a little volcano, apparently.

"Frome went out and looked at it, then phoned me. You heard how excited he was? It takes a lot to excite Frome. He seems to think it's some dangerous kind of energy that has been spattered on the Earth as a sequel to the disturbance you just witnessed. He wants us to go over and look at it."

TRAVEN nodded grimly. The East Lake Institute of Physics, and the East Lake Astronomical Observatory were jointly endowed by the Dunscombe millions and were supposed to function in perfect harmony. Actually, however, the staffs of the two institutions were at swords points most of the time. The twin buildings, which stood at opposite ends of the little village of East Lake, were often referred to as "Dunscombe's Folly."

Dunscombe was an elderly philanthropist of renown, and his benefactions

had been peculiarly liberal. He had dreamed of white citadels of science scattered across the American continent —of institutes with huge endowments primarily devoted to fostering a spirit of independent, noncommercial research. To Dunscombe pure science was a holy flame, and the genius of youth its elected guardian. In East Lake he had erected two imposing structures to house his dreams.

Traven was one of Dunscombe's beneficiaries. He shared with eighty-two other brilliant and uniquely gifted young men the privileges of the Dunscombian dream: a good income, self-respect and intellectual integrity, for the hitherto disinherited pioneers and prophets of pure science, in white citadels where life would be infinitely rich and rewarding; a laboratory and a playground combined. But most of the eighty-two were disloyal. They engaged in bickerings, and paraded shallow egoisms. The high, exalted vision of Horace Dunscombe was betrayed at every turn.

Traven, however, was loyal. Fearlessly probing into the mysteries of invisible light and molecular flow, he had exposed himself too recklessly to the luminous and actinic Becquerel rays of the deadly core of pitchblende. Radioactive substances were etching a trail of pain and death throughout his body. But he was still valiantly loyal to Dunscombe's vision. Though the infinite wonders of space and time had ceased to fill him with joy and reverent awe, though the heavens were darkened and life seemed horribly futile and empty, he still clung to his faith in the redemptive powers of science.

Perhaps in less than a century, if Weed and Stillman were right, the Earth would be a blackened globe spinning through uncharted space, and the great Sun a Nova without satellites, but man's brief day in the wide millennium of Earth time would remain somehow glorious in the cosmic mind—somehow eternal. Through science he had raised himself from a shaggy ape to a godlike being in the light of heaven. The scientific dream was the great, eternal dream—and without that there was nothing.

Something of this same stubborn loyalty burned in him now as he listened to Worden's explanations. Something unprecedented had occurred in East Lake. The solar disk had again greeted Earth after two billion years. Something alien had been hurled upon the planet's crust. Soon perhaps there would be other appalling changes. But meanwhile the two Dunscombe institutes must carry on.

"What instruments will we need, do you suppose?" Traven asked.

Worden was tugging at the loose flesh of his throat. "We'll go over in my car," he said. "We'll be able to take along a fluorescent screen, a small ionization telescope, a stroboscopic projector, an X-ray diffraction camera, a sheaf of ultra-violet plates, a sheaf of infrared, and the new photo-electric cell-vacuum tube amplifier that Frome sent over yesterday."

Traven nodded. "I'll get them together, and meet you downstairs in ten minutes," he said.

"Better have a couple of lab assistants help you carry the stuff down," said Worden. "That diffraction camera is heavy."

"All right," said Traven. "I'll check everything personally. See you later."

TRAVEN'S ESTIMATE of ten minutes completely covered the time which elapsed between his departure from Worden's laboratory and his appearance in the street below flanked by two heavily burdened youths in rubber lab smocks. Worden's car, an imported limousine upholstered in red leather, purred by the curb. It looked like an enormous hunched beetle with carapaces

slightly upraised and mandibles resting on the earth.

Worden was sitting, grim-lipped, in the driver's seat, with his lean, claw-like hands resting on the wheel. Traven climbed swiftly and silently into the seat beside him, turned about and barked out orders to the smock-clad youths over his shoulder. The paraphernalia was competently deposited in the back of the car. As soon as the youths withdrew Worden stepped on the starter and nosed the car out into the center of the street.

Traven looked upward at the bright, clear skies, as they gathered speed. The old houses and huge trees on the far side of the street faded into an amorphous blur as they sped across a wide intersection and beamed down a macadamized road flanked by vacant lots and an occasional shack of the Hooverville variety. Worden's car could do eighty on a smooth road, almost without vibration. It droned along like some slim, glistening ship of the skies plunging across the ether gulfs with the speed of light.

In the near distance the domed roof of the observatory appeared as a glistening dot under the shimmering constellations. It grew swiftly in dimensions and brightness as they roared along the deserted streets of the built-up north section of the town, sped over two more wide crossings and came to a halt with a grinding of brakes before a scene whose strangeness, weirdness and unearthly beauty etched themselves on Traven's mind in lineaments of flame.

A few feet from the edge of the pavement about fifty men and women were milling about on a level stretch of soil. They were shouting, pointing and gesturing. In daylight, under ordinary conditions, they would have depressed Traven. He hated crowds, and this was a polyglot crowd, a credulous, uneducated throng of men and women who lacked all scientific detachment. Traven recognized several village characters, pool-room loafers, loose-limbed morons from the amusement concession in East Lake Park. Of course, there were intelligent people there, too, school-teachers, professional men and scientists from the observatory, but on the whole the mental level seemed low.

But each man and woman was transfigured as though by an aura from the skies. White flame spiraled from waving arms, danced and glimmered about flowing garments, and snaked along the ground in the wake of scraping shoes. And because these very ordinary people were in the presence of something alien and stupendous their faces were transformed. All the awe and stifled wonder, all the haunting fear of the unknown in the depths of their little minds was reflected on their countenances, giving them an alien dignity. They looked like grim and tragic choristers from some Greek drama, like luminous figures of fate.

Traven threw open the door of the car, and descended to the curb. The elderly man beside him switched off the light on the speedometer dial, and climbed more slowly from the machine. Together the two scientists advanced across the pavement to the edge of the lot, stood for an instant staring incredulously at the milling throng.

III.

IT WAS difficult to penetrate beyond the outer circle of gesticulating forms. Traven was about to resort to strong-arm methods when a little, bald-headed man wearing thick-lensed spectacles and a soiled raincoat shouldered his way between the throng. When he recognized Worden in the moonlight, relief flooded his pinched countenance.

"Well, Frome," said Worden with a twisted smile. "It looks as though astronomy were a popular avocation

after all. Wish I could say the same for physics."

"You can," said Frome. "Stars and atoms and all the important things they took for granted will interest them profoundly from now on. I think the Sun's still sound. There has been a faint drag, perhaps, at the photosphere, but we'll probably muddle along for a few generations before the big pull comes.

"But, of course, we can't be sure. What has happened here is—well, frightening. The Earth has been bombarded. I've just been in long-distance communication with Chicago and New York. The radiant for the Leonid uranolites of November has been abnormally fertile. Débris has fallen over a wide area in the Eastern United States, and there are other roaring blots."

Traven's brow furrowed. "Roaring blots? You mean, there's some meteor débris scattered here that's still incandescent."

Frome shook his head. "Not exactly. At least, I don't think so."

"But can't you see it?" gasped Traven.

"No. Whatever fell embedded itself deep in the earth. So deep that—well, we've been sending plummet lines down for the past fifteen minutes. We've exhausted eight spools, and we haven't touched the uranolite yet. The chasm seems bottomless."

Worden's eyes began to shine. Unlike Traven, he was not impervious to natural marvels or vagrant thunderbolts of the imagination hurtling through the speculative skies of men's minds and becoming suddenly blasting and verifiable on Earth.

"How many feet of cord did you let out?" he asked.

"Over twenty thousand," said Frome. "Twenty thousand feet and no bottom. We can't——"

"But that's utterly incredible," injected Traven. "Even if the aërolite were at white heat when it struck the soil it would have been slowed and stopped by rock strata deep down. No meteor pit on Earth is as deep as a shallow mine."

Frome shrugged. White flame spiraled from his narrow shoulders, bathed his lean little frame in spectra radiance.

"Theories are cute but thin at a time like this, Mr. Traven," he said. "Suppose you see for yourself."

He turned and advanced upon the outer fringe of spectators. Traven and Worden followed him, marveling at the ease with which he cleared a way for his diminutive person between the onlookers.

In the pale moonlight they saw it—the bubbling, seething circular pit in Earth's soil. It was perhaps forty feet in diameter, with jagged edges bathed in white flame. All about it the luminous figures of the villagers surged. It seemed to exert a kind of unholy fascination for the wonderstruck men and women of East Lake.

KNEELING a few feet from the ragged rim, Basil Milton, a youthful astrophysicist from the observatory, was manipulating an enormous spool of plummet cord set in a massive metal base. The cord roared into the abyss below, yard after yard in swift unfurlment.

Frome's eyes were shining as he gripped Worden's arm, and drew him to within three feet of the luminous rim of that strange, incredible hole in the ground. The muscles of his face were twitching a little.

"It seems to be a deep-blue, the color of the night sky in the center, shading off to a blue-gray at the edges. I believe the flickering luminescence is an auxiliary phenomenon, perhaps electrical in origin. It was more pronounced at first, and appears to be subsiding."

Traven was staring at the swiftly unwinding cord in incredulous awe. "It's

unbelievable," he gasped. "If the aërolite exerted a pressure of hundreds of thousands of tons, if it tore through the Earth in a state of seething incandescence it would still be slowed, stopped. How many feet have you measured out, Basil?"

The youth beside the spool looked up, smiled grimly. "About seven miles of it," he said.

Worden was staring at the pulsing and boiling chasm of deep-blue air. At least, it seemed like air in turbulent motion—a mass of gaseous turbulence.

"Is it hot?" he asked.

Frome shook his head. "No. We put our hands into it. We were not burned. In fact, the sensation was one of slight cold."

"A valiant guy," thought Traven. Aloud he said: "If the aërolite has penetrated below the Earth's stony crust to the plastic isostatic level you won't touch it with fifty spools. But the isostatic level of magma stones is seventy-five miles down at least. It's inconceivable that the meteor has descended more than a fifth of that distance. Look here, suppose I try to detect it with the amplifying electric eye. Even if it's floating in stones fifteen or twenty miles down we can perhaps get an image of it with the eye."

"Good," said Frome. "We secured some amazing results with the eye last week. It will record the flare of a match fifty miles away without telescopic magnification. It also measures the faint glow of the farthest island universes, with magnification, of course. It measures faint luminescence beyond the range of photographic plates. I hated to let it go, hated to let you boys have it. But thank heavens, you've brought it back."

"We've brought other useful instruments that we didn't borrow from the observatory," said Traven. "I'm going to find out what the aërolite or whatever it was that fell did to the air in that—bubbling blot, I think you called it. I'm going to get photographs of the atomic structure of that big bubble."

Frome looked incredulous. "You mean you can photograph atoms *in situ*."

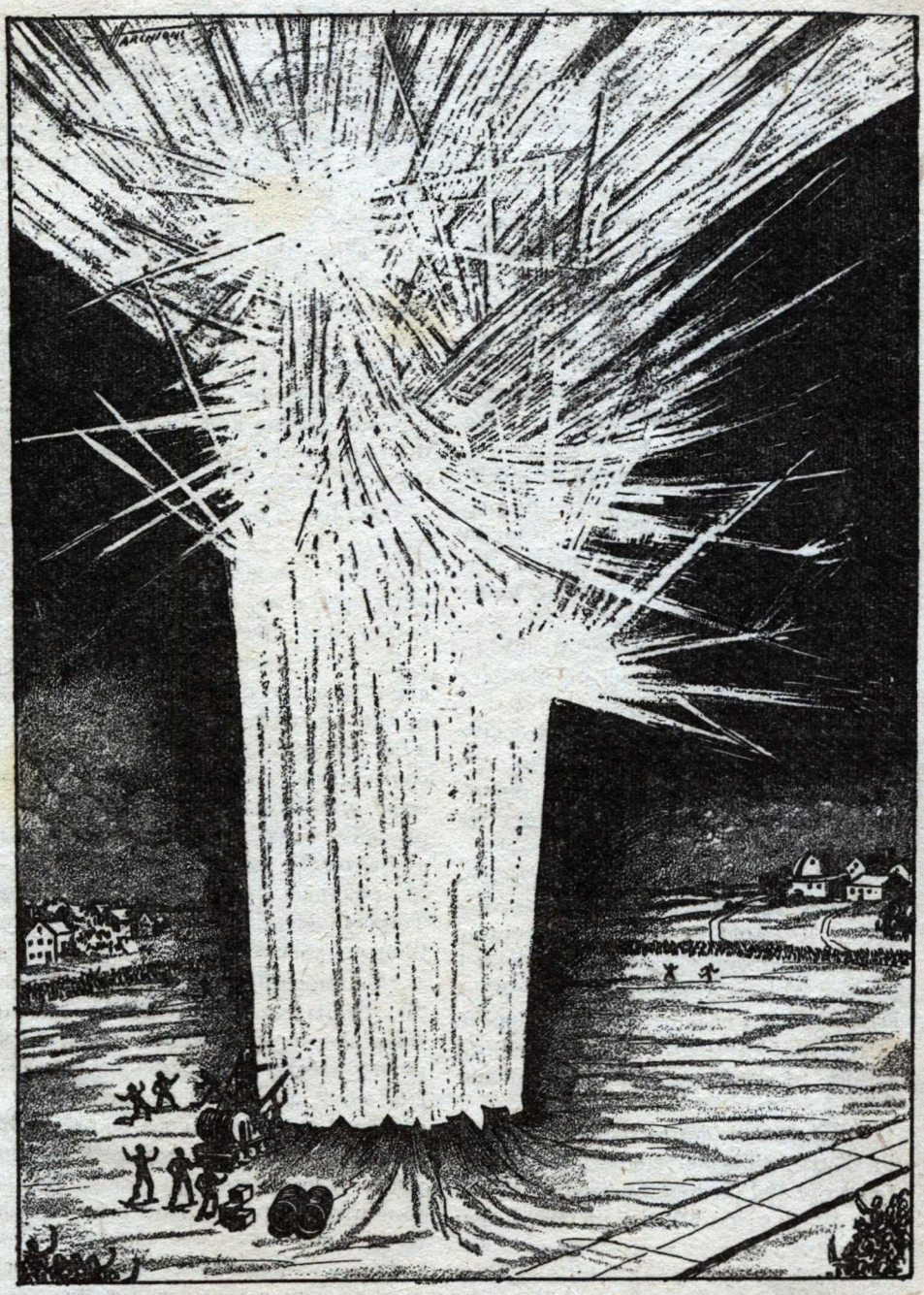
"Yes. By diffraction," said Traven. He heard Worden grunt. Worden didn't approve of boasting. Worden knew that Traven was a wizard with molecules, but a boast that missed fire was bad for the institute. But Traven simply didn't care any longer about little matters of prestige and decorum. He was proud with an honest pride, and too sincere in his grim, hopeless fashion to conceal his immediate thoughts and impulses.

Frome had left Worden's side and was bending above the plummet apparatus when the young man turned and elbowed his way with vigor, through the crowd. The weaving and spiraling lights were less conspicuous now, and a few of the villagers, doubtless less potent conductors of electricity than their fellows, stood out in stark, black relief against the luminous outer fringe of the throng. Traven was crossing the narrow stretch of pavement between the edge of the lot and Worden's car when he saw her.

SHE WAS standing alone on the curbing a few feet from the tail lamps of the imported limousine, staring across the pavement at the glowing villagers. A faint luminescence hovered about her slim body, haloed her auburn hair. She wore a white swagger coat that gave her a ghostly aspect as she stood very still and straight. The lovely oval of her face was shadowed by lines of sleeplessness and despair.

Her eyes glowed brightly when she saw that he was also alone. She ran toward him, fastened her arms about him, and kissed him on the lips.

"I thought I would find you here," she murmured. "What has happened? Was there a meteor shower, an explo-



A burst of sky flame—then, suddenly, it seemed to diminish, cave in upon itself——

sion in the sky? I saw the lights, but no one seems to know what caused them. Some one telephoned father from the observatory that something had fallen here. A bolide, he said. What is that?"

Traven turned pale. The woman who was trembling in his clasp was like a fragile vessel of flame and bright glory.

"Hold me," she murmured suddenly. "And listen, my darling. They told me about—the radium. Father and Dr. Frome told me. Did you think that mattered? Hold me, kiss me. We are together again. If this is really the end we shall be together always. Like Dante's lovers—remember?"

Traven said: "A bolide is an incandescent aërolite, Vera. Apparently one fell here and opened a deep chasm in the Earth. Frome thinks the cinder star exerted a faint tug, nothing to be alarmed about."

Vera Branch pressed her mouth to his. "I will never let you go, my darling. We will live again."

Traven clasped her wrists and gently untangled her arms. "I've a job to do," he said. "I must take some photographs of the meteor pit. I can't let Frome and the others down."

She looked at him, wondering. His lips twitched, torment looked out of his eyes. It would be folly and madness to let her know that she had lighted a great flame in his heart that withered the dross in him. He must appear casual, unconcerned. Youth owed no loyalty to death, and he was already dead.

She followed him to the car, watched in silence while he removed the amplifying eye and diffraction camera. When he turned toward her with the heavy apparatus her eyes were shining.

"I will go now, Tom," she said. "If I stay, you will go on pretending, and my presence will make you so nervous that the tests will be ruined. But tomorrow—I shall see you again. And the day after, and for as long as we both shall live."

She turned abruptly then, and walked with steady steps away from him until her slim, white form was lost in the shadows that clustered thickly about a row of gigantic elm trees at the end of the block.

Traven set his lips grimly, advanced with slow, almost staggering steps to the edge of the throng of onlookers. When he made his presence known they cleared a passage for him, staring with excited eyes at the cumbersome apparatus which he was carrying. Frome was still fussing and fuming about over the plummet spool when he approached the edge of the pit.

The phosphorescence had nearly vanished now. The tall form of old Worden seemed brighter than those of the other spectators, as though his dynamic energy had drawn a surfeit of flame.

Traven worked swiftly, setting up the amplifying eye on a tripod at the edge of the pit, and the camera a few feet away on a shorter tripod of curious construction. Frome arose from the spool and crossed to where the young physicist was standing. Incredulity and a certain admiration looked out of his pale-blue eyes. "Take your time, Tommy," he said. "We don't want anything to go wrong."

"Nothing will," said Traven, nodding. "In about ten minutes I'll have something for you, I think. But simply photographing that bubbling mass *in situ* won't give us what we want completely. I'll have to do some mathematical calculating, construct a template. I'll explain all that in the lab to-morrow, when I show you the pictures."

He set to work then, in grim earnest. Dronings, whirrings, faint, almost indistinguishable sounds mingled with the roaring from the pit as the huge amplifying eye functioned, and the

camera clicked and began to turn about on its curious tripod.

Traven shut it off, then on, then off again, moved it nearer to the pit, regulated the electric eye, mopped the sweat from his brow and coughed hollowly. Worden watched with grim features and shining eyes. Frome watched as dim lights flared, as the luminescence, as though in response to the complex of energies released beside the pit, flickered up again, ascended in banners, wrapped some of the awed watchers completely about.

In about ten minutes, as Traven had predicted, the eye ceased to function. Meanwhile, Traven had dropped to his knees near the edge of the pit and was laboring with tiny filings of steel, arranging them in triangular and criss-cross formation on the hard soil. Just before the camera ceased to function he had constructed a template which he slid before the lens of the camera. The template began furiously to rotate while the camera clicked and turned.

"X-ray diffraction," murmured Traven. "I'm sure we've got something. Sure."

IV.

THE NEXT MORNING a group of grim-faced physicists and astrophysicists stood before a screen in young Traven's laboratory, staring in silent awe at the image of an atom, or what looked like an atom magnified a billion times.

Traven stood a few feet from the base of the projection screen. His face was pinched and weary from his labors of the night before; his hand which manipulated a five-foot pointer shook a little as he spoke in a voice which hardly rose above a whisper.

"This photograph, gentlemen," he said, "was obtained by X-ray diffraction—by employing a speedily revolving template whose shape was carefully determined by mathematical calculation. The template was photographed in juxtaposition with X rays scattered by helium, argon and several other gases.

"If you looked at an atom under an X-ray microscope, an atom magnified a billion times, you would see an image in many respects similar to this. I have photographed an atom in the only way an atom can be photographed. Such photographs are perhaps not completely dependable, but they are certainly the opposite of misleading as far as major features are concerned.

"This is the strangest atom that I have ever seen. You will notice the complete absence of a nucleus. It seems to be composed entirely of negative electrons. In normal atoms the outer group of electrons called the L Group is clearly distinguishable from the positively charged nucleus which science, for want of a better name, now calls a proton. A proton is a kind of hole of positive energy in the center of an atom.

"In this atom the positive charge seems to have been annihilated by a negative electron and escaped as electromagnetic energy. You will notice the almost identical shading of the entire atom. There are no concentric rings. This, in other words, is an atom in a state of disintegration which still maintains its essential integrity, which has not flown apart.

"All of you gentlemen, I suppose, are familiar with the theories of P. A. M. Dirac, the young British physicist. Dirac holds that there is no such thing as a completely empty vacuum, that a perfect vacuum is simply a region of space where all that exists is composed of negatively charged electrons. He holds that matter as we know it is simply a hole or vent in this sea of negative energy. In other words, only negative energy is real, basic.

"The material universe is simply a kind of hole or vent in the vast ocean

of negative energy composing ultimate reality. When the positive charge is blown from an atom, when the proton is annihilated, the atom becomes real, basic. Theoretically, it should burst asunder, but under certain special conditions it may maintain its integrity as an atom. This last, though, is my theory, not Dirac's.

"We seem to have here the shell or husk of an atom, the maintenance of a kind of atomic pattern after the positive energy substance has been blasted out of existence. And this shell may represent basic reality, the substance from which the universe of stars was built up over milleniums of time.

"Millikan believes that atoms are building up somewhere in space. Is it not conceivable that there are, somewhere in space, universes of these negative units of matter which only await a positive charge, the injection of a single proton? But that does not really concern us here. What we are concerned with is an utterly abnormal condition of matter or energy, or call it what you will, represented by this atom.

"Where could such negative units originate to-day, within the radius of the solar system? Where could they originate on Earth? What could blast an atom back to its original negative state, to a mass of negative electrons within a hollow shell? No force within our experience, gentlemen. Only terrific heat could do that.

"Heat, gentlemen. Something was hurled to the Earth from the solar disk that was hotter than the Sun's photosphere. The heat at the center of the Earth is as hot as the photosphere, and we may be quite sure that atoms there still retain their positive charge. The surface of the Sun is no hotter than 10,000 degrees Fahrenheit. But at the center of the Sun the temperature may be billions of degrees. We do not know, of course. But certainly matter there must be in a curious state. Jeans says that we can only speculate as to the conditions of matter at the Sun's core.

"Gentlemen, I believe that the cinder sun exerted a freakish kind of pull or drag. I believe it ripped a comparatively minute mass of internal sun-substance from somewhere near the inconceivably glowing core, and spattered it upon the Earth."

THERE WAS a muffled exclamation from Frome. He was standing in a remote corner of the laboratory, beside a drawn, black shade. A young man from the observatory who was standing beside him nodded. Worden, who was down in front, nodded too. Disbelief was reflected in several faces, resentment in not a few. Michaels of the laboratory staff, and Winter of the institute looked at one another.

Michaels blurted out: "We should have thought of that. It is certainly possible."

One of the resentful ones said: "You're a physicist, sir. It seems to me you are going beyond your province."

Traven frowned slightly. "Perhaps," he said. "But it is really the only possible explanation. Stillman believed that later on, when the drags became persistent and cataclysmic, glowing matter would be ripped from the interior of the Sun. The first drag was simply a freak phenomenon. I believe the substance was spattered widely before it hit the Earth. That would account for the twenty roaring blots in the United States and the eight in Europe.

"The glowing matter was hurled across space before it could cool perceptibly. It would take many years, and more than the cold night of space to reduce the heat at the Sun's core even a mere million degrees. Take a little of it and send it to Betelgeuse at the speed of light, and it would arrive hot.

"It tore through the Earth annihilating matter wherever it spattered, or rather, knocking the protons from atoms, leaving a kind of seething vacuum, a yawning void in the Earth of negative universe substance.

"The small camera attached to the photoelectric eye contained six plates. Each plate came out of the developing tank the color of ink—no image, nothing. We do not know how far down the glowing matter went. But the failure of the eye to function indicates that the roaring blot is a true vacuum. Matter as we know it has simply been annihilated for hundreds, perhaps thousands of miles—perhaps to the Earth's core.

"But it is a curious vacuum, a vacuum that seems to seethe and boil, indicating a kinship to matter in its normal state. It does not harm our bodies. Dr. Frome put his hand in it. It feels slightly cold."

TRAVEN'S EYES suddenly began to shine. It was curious. He had been speaking evenly and smoothly, with nervousness in his manner but not in his voice. Suddenly his voice grew tremulous.

"Gentlemen," he said. "I have a favor to ask of you. Possibly I have been of some slight value to the institute during the past eight years. I have tried to work without preconceptions, sincerely, honestly, as Dunscombe would have wished. Now I'm finished. I think you know that, all of you. The doctors have given me two months. They are kindly men and—optimistic. I am quite sure that I shall not last two months. But no matter.

"I should prefer to pass out in harness. I should also like to repay Dunscombe a little more fully for his generosity. I could render a final service to the institute and the observatory by descending into the blot. We do not know what conditions are far down within the Earth. I could descend through the roaring blot to any level, and——"

"Why, you are mad, sir," exclaimed Frome. "The temperature increases ten degrees with each six hundred feet of descent. You'd be roasted to a crisp. The pressure near the center of the Earth is fifty million miles or more to the square inch, and the heat exceeds that of the solar photosphere, as you've just said yourself. It would be suicidal to attempt such a thing!"

"I shall be secure from the heat and pressure without the vacuum," said Traven. "I can take instruments with me, and perhaps project them beyond the vacuum, testing and observing conditions on the four major layers of the crust as I descend."

There was an excited hum of comment and speculation amongst the little group of scientists. Most of them seemed to approve of the amazing proposal, but a few expressed doubt, a few envious disapproval, and even resentment, and old Worden himself, although he approved, voiced his doubts with vigor.

"It will be a frightful risk, Tom," he said. "We don't know what the vacuum will do to a human body, really. Even if you wear some kind of protective suit equipped with oxygen tank the negative molecules, if they are actually in the state you describe, may penetrate and destroy you. Obviously, this isn't an ordinary vacuum, as we understand the term. Pressure, heat may penetrate at the lower levels. Frome withdrew his hand quickly, remember. It is inconceivable that you could descend, without hazard, to the center of the Earth."

"I should like to try," said Traven, simply. "Have I your permission, gentlemen? Will you let me descend as a representative of the institute, and put the institute's resources at my disposal?

I should like to use one of the stratosphere suits in the observatory's supply lockers—also numerous instruments. Without your backing my hands will be tied."

There was further comment, excited contention amongst the divergent groups. Finally, however, in diminished intensity, it subsided to a low hum, as Michaels assumed sudden, full responsibility for every one in the room.

"As a director of the Dunscombe Institutes," he said, "I am privileged to cast eight votes for or against any decision involving research appropriations. Dr. Frome and Dr. Worden have eight votes apiece. They have authorized me to cast sixteen votes for the proposal of our valiant young friend here. I cast my eight, and I also cast the votes of every man in this room into the same affirmative basket."

He smiled. "Any objections, gentlemen?"

There was complete silence in Traven's laboratory. Traven smiled a little, too, and a faint trace of moisture crept into the corners of his eyes.

V.

THE NEWSPAPERS carried no mention of the vote-casting or of Traven's negative atom the following morning. The twenty roaring blots in the United States roared loudly in headlines from New York to Melbourne, and a frightened and chastened world accepted the hideous reality of an instable Earth.

Stillman was honored by the Royal Society, and Weed was besieged by crowds of excited and frightened people when he left his home in Maiden Lane for consultation with his anxious colleagues at Oxford. Even statesmen and politicians were shaken along with the world's marts.

Stocks tail-spinned into a region of panics, and the war makers turned their thoughts from shining armor and drawn swords to scientific realities for the first time in the history of our race. Even in the sun-scorched Ethiopian deserts where for two decades irate Africans had waged unceasing gorilla warfare on irate Europeans there was a sudden cessation of hostilities and under the torrid African sun nearly naked black men lipped a scientific jargon, and gazed in fright and terror at the solar disk.

But the great sun shone brightly in the sky. Stillman was vindicated, and save for the roaring blots in the Earth's crust there was no change in the world men knew. Even the disturbances of wind and wave that ordinarily accompanied sun spots failed to materialize, and Earth's oceans were calm with an unwonted calmness, and the breezes that fanned the mountains and valleys and plains carried still the pleasant odors of the soil and of growing things, and over all Earth the birds sang still.

Only men's minds were darkened and fear-shadowed—men's minds and men's activities which were conditioned by the morbid functioning of nerves and abnormally stimulated brain cells. In East Lake the tension was greater than elsewhere. Despite pledges of secrecy and a thousand precautions emanating from the institute's staff the townsfolk knew that Traven was about to descend into the Earth.

Cordons of police had been thrown across both ends of the block where the great chasm of negative matter roared and pulsed and billowed. A hundred feet from the lot, in both directions, men and women fought fiercely to break through the legal barrier, struggled to catch a glimpse of the grim, solemn little group about the blot.

The group was a small one. Frome was there and Worden, and five young men from the observatory who were

worthy and whose hearts were warm with friendship. There were also several other men from the observatory, two lab assistants, a young physician, Vera Branch's sister, who resembled Vera in many respects, and Vera's father, an elderly man with a worn, kindly face and graying temples.

Vera Branch stood very quietly a few feet from the roaring, pulsing blot. In daylight the bubbling surface was of a pale, opalescent sheen, grayish fading into blue. Vera's face was ashen, her eyes deep-shadowed. As Frome placed the stratosphere helmet over Traven's head, turned the screws at its base, and adjusted the double staples on the young scientist's shoulder which would guide and regulate the flow of wire from a fifty mile coil she dug her nails into the palms of her hands, and looked swiftly away.

Through the quartz window of his helmet Traven watched her. He watched her steadily, desperately, in a kind of trance, as though he sought to draw all of her sweetness and grace and loveliness into his mind and hold her forever in memory.

As soon as the helmet had been fastened into place Frome tapped lightly on the circular window of quartz above Traven's white, drawn countenance. The tapping signified that everything was in readiness. Traven raised his arm, and turning toward the grim little group made a wavering gesture of farewell. He had already embraced Vera; and he could not steel himself to endure the bittersweet agony of another leave-taking.

Turning swiftly, he walked to the edge of the pit, and stooped. When Vera saw that he was about to go she ran to him with a despairing cry. But when she reached the region of pulsing light he had disappeared and the wire was unwinding slowly from an enormous massive spool which revolved in a base of tempered steel near the center of the lot.

Behind the revolving spool two unmoving spools, equally enormous, glistened brightly in the early morning sunlight. When these were exhausted, there would be others. Traven would be accompanied by a metallic life line far down under the Earth's crust, even to the seven hundred mile layer of oxides and heavy sulphides.

Vera began to sob quietly. Her fragile body was racked by grief and despair as she stood by the edge of the blot staring at the bubbling vacuum. Like an ocean cable roaring from massive spools in the hold of a cable-laying ship the glistening strands descended. The spools were the institute's final, parting gift to Thomas Traven, its generous tribute to his valor.

FROME watched the great spool turn. He was grim-visaged, and his mouth was set in anxious lines. Worden was standing with Vera's father and sister, several feet from the rim of the blot. Suddenly he straightened, crossed quickly to Vera's side and laid his hand on her shoulder. "He will return to us," he said. "I am sure of it."

His words were more prophetic than he dreamed. Yet the return of Thomas Traven was not accomplished through his own willing or the conscious cooperation of the institute's staff. The great upsurge of alien and incomprehensible forces came suddenly and terribly, without warning or heralding signs.

From the roaring, bubbling blot an immense column of blue fire shot suddenly skyward. High into the air the great flames roared, and soared, in a spreading, blinding shaft. Exclamations of terror and startled wonder burst from the little group. The entire surface of the blot was obliterated by the flaming column and for an instant,

as the watchers stared skyward, white flame seemed to roar down to meet the stupendous upsurge of fire.

A burst of sky flame spread itself across the woolly masses of lenticular, turret and curl clouds which hovered over the shining dome of the observatory, and streaked outward in jagged banners and crescents of livid radiance. The Sun's corona flamed into visibility, and a slight tremor shook the Earth.

The startling and awesome phenomena were of momentary duration. The ascending column of flame seemed suddenly to cave in upon itself, to diminish and thin until it became a single, wavering, threadlike filament of blinding fire.

For an instant the radiance in the sky continued, then it too was dissipated. The Sun's corona faded and the filament from the pit vanished utterly.

High in the air above the awestruck group a grotesquely clad human figure was spinning. Suspended vertically a hundred feet above the heads of the men and women below Thomas Traven was turning swiftly about in the air, revolving in pin-wheel fashion, with spasmodically jerking limbs. For an instant the forces which had lifted him from the pit continued to sustain his moving body. Then, slowly, he descended toward the mound.

His body was still revolving as it came to rest on the narrow stretch of pavement adjoining the lot. His shoes skimmed the curbing, and he turned completely about three or four times slowly as though still in thrall to the mysterious forces which had spun him about in mid-air. Then his legs seemed to turn to water, and he collapsed in a crumpled heap at the edge of the pavement.

Vera ran to him, fell to her knees and tore frantically at the twisted lacings of his stratosphere suit. Frome strode swiftly across the lot, and assisted her. The screws at the base of the helmet resisted the efforts of his fingers and the lacings at the front of the suit were horribly tangled. But they worked feverishly, in an agony of apprehension, and at last succeeded in freeing Traven from his prison of metal and heavy cloth.

Vera moaned with relief when Frome lifted the helmet from Traven's head. His eyes were open and he smiled at them in his familiar, twisted way.

"I'm all right," he said. "I went down about twenty thousand feet, I guess; then something happened. I seemed to rise up, to shoot through the air. It was a strange, ghastly sensation."

Worden was shouting in amazement. His aged voice rose, then broke sharply on a note of turbulent emotion.

"The roaring blot is gone," he cried. "Look there! There is no longer any gap in the soil."

Swiftly the others crowded about the spot where the vent had been. They stared in wild incredulity, pointed and shouted as they pressed forward in the bright sunlight. Above the region of former turbulence there spread the familiar brown soil of Earth. The roaring blot had vanished completely. The Earth was whole again.

LATE THAT AFTERNOON Thomas Traven sat in the reddening sunlight in the sun parlor of Stephen Branch's home, held Vera Branch's slim, warm hand, and spoke to her in a voice that was tremulous with joy and the ecstasy of rebirth.

"The glowing mass of substance evidently mingled with the molten matter at Earth's core and this amalgam generated an electromagnetic field of stupendous potency. We knew that somewhere in the universe atoms were being built up from immense space seas of negative energy, but the actual proc-

esses which contributed to this building up comprised one of the great, baffling mysteries of science. We could only guess, speculate. Now I think we know a little more about it.

"Apparently when an atom is blasted by terrific heat and pressure it does not wholly disintegrate. It retains its essential shell or mold. This shell, composed entirely of negative electrons, is primal reality, the universe stuff itself. Inject protons into it and you get matter, energy, the world substance with which we are familiar. The roaring blot was a region of negative or primal universe stuff, containing atomic shells that would return to their material state as soon as they were recharged or regenerated, as soon as the protons were fired back in.

"Apparently the glowing substance that was spattered on Earth's crust annihilated matter in its downward sweep and later regenerated it by creating a special kind of electromagnetic field at Earth's core. This field evidently built itself slowly up over a period of many hours, and then sent a terrific positive charge sweeping upward, restoring the quintillions of negative atoms in the blot to their original positive state—blasting protons into the atomic shells or husks, in other words. Incidentally, the upward surge was preceded by a faint, premonitory electrical or magnetic phenomenon which was sufficiently powerful to hurl me from the blot.

"The soil, and the rocks under the soil, and all the other mineral and gaseous elements assumed their original garments of matter because, don't you see, each individual atom retained its individuality in the negative state, and when the proton or positive charge was blasted in again it became its old self without modification? Hydrogen shells became hydrogen atoms; argon shells, argon atoms; neon shells, neon atoms and so on."

Vera nodded, pressed her cool cheek to Traven's cheek. "That is not the greatest miracle, dear," she said.

"It is really the greatest miracle," said Traven. "The other is personal and hence ultimately unimportant. Exposure to that strange brief vacuum in matter healed me, blasted the radium blight from my body. For that I am deeply grateful, and my cup of personal happiness is brimming over. But compared to the wonders of space and time our little joys and sorrows are but——"

She stopped his words with a kiss. "Hush," she said. "You will always remain science's fool. Is not the mystery of love as transcendent as that other glory? Hush, my sweet darling."

A Little Green Stone

The story of a trinket that echoed madness on Euthan

by J. Harvey Haggard

IN THE white spray of light a mold-incrusted fist hued with corrosive blue came up to contact the furry blob of the face helmet below the strip of the visor. Behind the transparent visor a pair of gray eyes looked dazed, and fluttered shut. An instant later, a hideous face, wide-mouthed and snarling, leaped upward toward the attacker. Sapphire eyes, in a slanted, pear-shaped head, glowed like gems. Two talonlike hands, covered with short yellow fur, snaked up toward the throat of the man who had struck his fellow.

The recipient of the blow stumbled and fell into the knee-deep fungus growth that covered everything visible in the swath of light, leaving a man and a creature that seemed to be half monster struggling back and forth, sometimes immersed momentarily in the full play of the illumination, sometimes lost in the abysmal blackness that hovered to either side.

The terrestrial combatant rather resembled a gigantic terrestrial bear standing upright, an appearance that was enhanced by the hairy covering of inch-long mold tendrils that had formed on the outer surface of his encompassing chitonium armor. As he struggled with the bestial denizen of another world, he sought to draw the dissembler blast gun from a holster at his waist.

"Blasted universes!" I exclaimed, and my hand, holding the hand beam which emitted the spray of light, shook uncertainly. "What's coming off here?"

Action had developed with a speed that was disconcerting. One moment we had been progressing along into the dark umbra of the Euthanian planet, a party of four, of which three were terrestrial and the other a native, and the next moment, an Earth man was down, with a deadly conflict raging in our midst.

My unoccupied right hand sought instinctively for my own blast dissembler, holstered against the "chit" armor at my thigh, but to discharge a lethal ray would have been rankest folly, since the struggling figures were in such close quarters that my emanation would undoubtedly have done as much harm to the man as to the growling demon that clawed for a vulnerable spot.

The light wavered, cutting through the intense darkness to settle upon one of the strangest scenes ever destined for Earth-born men to witness—the surface terrain one encounters in the long ten-month darkness periods of Euthan, the "trans-Plutonian planet," across which the combatants struggled so ferociously.

Each movement sank them knee-deep into the fragile mold growths that covered the ground level; their savage actions crushed the fragile formations and left twisted pits and furrows in their wake; beyond them, on low ridges, the white-limbed X-ray trees of Euthan thrust quivering branches upward, their leafless projections hanging with pale toady flowers; here in the sunless periods a bizarre plant life, independent of sunlight, waxed fertile.

Nothing on our Earth could have re-

Only an instant passed before the creatures were arcing down, circling our heads, or swooping through the expanse between us.

sembled those two antagonists, one clad in chitonium armor from head to foot that was in turn incased in a thin layer of the quick-settling parasite mold, which is so characteristic of Euthan's long nocturnal period, the other a shaggy half-naked monster that resembled a beast as much as a man. Perhaps the man was the more alien as compared with the environment, since only such a savage creature could have appeared natural with such a background.

THAT TABLEAU is etched in my memory, even now. I was utterly helpless. The best I could do was to play the light of my hand beam upon the belligerents. If the cunning of intellect won out, well and good, but if the beast were to emerge victorious—I had my weapon ready.

Twice they fell, and twice they regained their feet, clinging to each other, striking, tearing. Then a talon came free and raked upward. The face plate of the terrestrial was wrenched up on its hinges. I caught a glimpse of the terrified face, just as long curving fangs, dripping with dark saliva, were bared near the terrestrial's throat for the fatal slash.

At the instant, the man was held powerless by scaly arms. But at that moment, a golden cord swung loose from his throat, and a tiny green stone, hanging pendent, caught the Euthanian's eye.

It was a small stone, something like jade. No larger than a beetle, it was smooth and rounded on all but one end, which was shattered and rough. The yellow eyes caught the glint of color; for an instant its attention was distracted. Then suddenly, the blast dissembler weapon came free. In close quarters, the man clubbed the weapon and struck twice viciously; the dull thudding blows rocked the monster on its heels. Shuddering, it fell, the yellow eyes twitching in a stunned manner.

Jules Cathin braced on his toes. Before his onslaught a terrestrial and a monster, spawned from the evolutive limbo of Euthan, had gone down. He brought up the weapon with a trembling hand, leveled the triangular projector.

"Jules! Jules Cathin!" It was the imploring voice of Eric Stone, who had fallen before the savage encounter. "Jules, my friend—my friend." He had lain motionless for a time, but now he was on one elbow, with the helmet plate up, revealing a terror-stricken face. Deep tragedy was graven in the twist of his tiny lips; the gray eyes opened widely at some unspeakable horror. With a sudden exertion, Eric Stone came to his feet and knocked the weaving muzzle of the weapon aside.

"Don't be a fool, Jules," exclaimed Eric Stone. "Kalutu won't hurt you. Back, Kalutu!" he shouted, as the monster snarled and came to its knees. Obediently, though reluctantly, it cowered away.

"Good Lord, Cathin!" I exclaimed. "Have you lost your senses? I thought we had a perfectly peaceable party, until you cut loose. What's the matter, anyway?" I suddenly realized that my voice was doubly muffled, now that the chit armor was crusted with the blue mold.

HURRIEDLY, I scraped aside the fragile furring of fungus that had gathered on the metal portions of my movable head plate, and slipped it up. Short periods of exposure with an uncovered face on Euthan can do no harm, since the action of the minute fungus spores, carried on the wind, is not immediately injurious. The light-weight chit toggings are worn principally for convenience.

It isn't a pleasant occasion to abruptly realize that one's face has changed outwardly to a hideously writhing mask of spores, and for this reason, a terrestrial cannot endure direct exposure. Luckily, these spores feed on tiny particles blown

in the moisture-laden atmosphere of Euthan, and are not parasites in the true sense of the word.

With the helmet turned up, I saw that Jules had done likewise. He stood, breathing passionately, staring at the man who had intervened into the throes of his killing lust. The cold air bit into my nostrils like gaseous icicles, bringing with it the crawling sensation of blown spores, each so tiny as to escape definite delineation by the eye, although the vista resembled remotely the gentle fall of Earthly snow.

A faint, stagnant scent, as of the fermentation of rotten fruits, swept into realization. Distantly, too, I could hear tiny rustling sounds as of frothy bubbles bursting under the fungus plants, and the aroma of alcohol was evident through the bittersweet wind of nocturnal Euthan.

Jules Cathin was past the prime of life. His face was rugged and ashy; in his eyes gleamed some indefinable spark, some deep purpose. Few people knew of the incentive that had drawn Jules Cathin across the stars to this planet his wandering feet had trod before, as iron filings are drawn to the loadstone. Eric Stone had been his stanchest comrade then.

"I'm your friend, Jules," pleaded Eric Stone, as the rage continued to flare in the other's eyes. "You've got to believe that, and do as I say."

"Stand back!" ordered Jules, his voice harsh with emotion. "I'm going to shoot—that contemptible thing."

His words might have been invisible whip lashes cutting across Eric's cheeks. The smaller man swayed slightly, and his face was drained of color.

"You're not, Jules," he cried tremulously. "Kalutu is a man, not a beast, despite his looks. He is a friend, who respects me—would die for me. He knows loyalty, which apparently you do not. I'm not going to see him shot down in cold blood, merely because he tried to protect me from your locoed attack."

Kalutu, braced on his huge shaggy feet, swayed to and fro, his tiny yellow eyes fixed hatingly upon Jules Cathin. A metal-mesh cloth was wrapped tightly about his torso; the thickly sinewed limbs were left bare, protected from the elements merely by thick tufts of tawny hair. The nostrils in his pear-shaped head were mere slits, dilating rapidly under the force of his turbulent breathing, and the thick lips twitched above long canine teeth.

"Eric, I trusted you," spat Jules Cathin. "We've been pals for a long time. I want you to stand aside. Kalutu is no native of Euthan, and you know it. He's like a wolf, or a tiger! I've seen the natives of Euthan. I lived here, twenty years ago, among their tribes. They're beautiful beings, not like devils."

"You lived here," protested Eric defiantly, "but you are mistaken. Kalutu is a native Euthanian, even though he is malformed and not as comely as the others. If you kill him, you'll live to regret it."

THERE WAS a ring of truth in the words of the small man. Somehow his earnest pleading seemed out of proportion to any devotion he might bear for the unsightly Kalutu, even though the monster had been his only companion at the trading post. Jules Cathin hesitated. Even yet the Euthanian seemed ready to spring upon him at any moment. Then Cathin relented.

"Very well," he said. "If you give me your weapon, Eric, I shall not kill him."

"This is a mystery to me!" I exclaimed. "What's it all about, Jules? Eric Stone is our only guide here in the dark lands."

"We've been without a guide for quite a while, Throkley," Jules retorted grimly, extending a pudgy chit-gloved hand toward faint markings that led

diagonally across our fresh footprints in the fungus underfooting, a faint trail that vanished into the murky dark beyond the light of the hand beams.

"He's been leading us in a circle, despite his lying pledge of friendship. He's never intended to lead us toward the present living site of the nomadic people of Ruthan. He ought to know where they're at right now, being a trader here. All this about the giant bat-moths has been to sidetrack us and divert us from our purpose."

My knees began to feel weak then, and I wanted to sit down somewhere to think it out. We were in a portentous predicament indeed. An ominous foreboding had lurked in the invisible gloom that perpetually blanketed the black plains of the Umbra of Euthan. I had sensed a menacing premonition.

Twenty years before a younger Jules Cathin had been here on Euthan, with a youthful Eric Stone, mingling with the nomadic natives. Now Jules Cathin had come back, serving in the interests of the Earth Trading Co., to establish a relationship between the intellectual beings of two planets. I, too, served the great corporation that was linking the habitable worlds of the solar system with the invisible bonds of commerce.

We had come to the trading base of the Earth Trading Co., located on the equator of Euthan at a point now well within the ten-month night of the small outermost planet. The operating trader, who had lived here more than twenty years, Eric Stone, had been charged to aid us in every possible manner in our efforts to contact the natives. Jules Cathin knew of their nomadic habits from his own previous experiences; without the aid of the trader we might have spent many fruitless months searching for them.

When we had landed from one of the company's space freighters Eric Stone had welcomed us heartily enough, but I felt that he was concealing something from us. He must have been a lonely man, living at the trading post with only the half monster, Kalutu, for companionship. The two were attached by a strange bond of affection. At times Kalutu wandered alone into the desolate wilds of Euthan, but always he had returned to Eric Stone. Theirs was an unusual friendship.

I suspected that this lonely life might have changed the trader. In some way that was hardly perceptible, his viewpoints might have altered. He was glad enough to welcome us to Euthan, but to our surprise, he had been entirely reticent when we mentioned our mission, even reluctant to comply with our wishes.

Finally, fearing to antagonize the superiors of his company, he had admitted that he rarely saw the natives during the long ten-month night periods. At our vigorous demand he had finally agreed to guide daily expeditions out into the Euthanian night, in search of the scattered tribesmen.

EACH DAY we had pushed out eagerly in a new direction, lighting our way with small compact luxobe lanterns and hand beams. On our backs we packed meager rations of concentrate foods. After eight days of perilous travel, beset always with the danger of breaking through a deceptively thin crust into stagnant pot pools of the viscid water that gathers on Euthanian terrain, we had arrived at the base of a cliff where Eric Stone claimed he found old evidences of habitation.

By kicking aside the fungus growths, we found traces of broken utensils, which were made of a transparent material that resembled amber celluloid. The trader informed us that these were devised of a native clay, subjected to special heating treatments. And when we tried to find a fresh trail leading from the former camp, we drew a blank.

Then our guide had suggested that we

explore a near-by range where he avowed were titanic moths of a size and species never heard of on Earth. For lack of a better name he had called them the bat-moths, since they were not related biologically to any of the species found on the terrestrial globe and made their appearance only in the nocturnal periods.

Our curiosity had gained the upper hand; there was always the chance of stumbling upon a nomadic tribe. After a perilous ascent over precipitous ledges and ragged convolutions of razor-sharp rock that was disguised by spore accumulations, we came out upon a broad wind-swept plateau.

As we pushed forward the ground sloped with a gentle descent. Frequently thereafter, we skirted great pools of stagnant water, raggedly covered with floating remnants of blue-mold crust. These were the insidious pot pools, those terrible traps where death lurks for the unwary foot; but the ones we feared were the unseen ponds that might lie beneath each deceptively smooth expanse of the blue fungus aggregations.

Once I saw a turmoil in the sluggish waters, as though a great body had fallen recently, a victim to noisome depths. After what seemed an interminable period of hazardous trekking, Jules Cathin had discovered that we were traveling in circles. The knowledge that we were being purposefully deluded had ignited his temper.

PERHAPS the *parlous pass* in which we found ourselves will be better understood if I stop to explain a few of the characteristics of Euthan. Euthan, the trans-Plutonian planet, is 3,506 miles in diameter, and is circled by one moon. The oceanic and bodily tides aroused by the moon have acted as a gigantic brake, resulting in a rotation that encompasses nearly twenty months.

The daylight period of ten months duration is accompanied by excessive vegetative growth, resulting in a luxuriant jungle bush that mats every available bit of soil. With the coming of the ten-month night, the vegetation perishes almost instantaneously and decomposes rapidly under the action of highly developed parasites that wax fertile in the dark hours.

The poles of Euthan are almost exactly perpendicular to the rays of the sun. Thus there are two seasons, following each other endlessly around Euthan. The vegetation growing in the darker period differs in several particulars from ordinary plant life:

First, it is either parasitic or feeds on tiny particles carried by the wind. Silvery sprays of parasites gather on the blackened stumps of trees that had lived in the daylight, and the result is a weird mimicry of the former plants, which are referred to most often as X-ray trees.

Secondly, normal plant growths function through a system known as photosynthesis, and cannot exist in the absence of the solar rays. The X-ray parasites utilize cosmosynthesis, as do the fungus plants and the blue mold. The cosmic ray, manifested with universal strength in visible light's spectrum or in total darkness, is a vital essential in the lightless world of the Umbra. Among the vicissitudes afforded by these extremities of plant life, animal life must survive as best it may.

A further obstacle is encountered in the magnetic variations of the planetal body. The polar fluctuations are so continuous as to render a compass a useless bit of added weight. The air is so impregnated with flying umbrella spores and particles of decomposing vegetation as to obscure all starlight, hiding the familiar sign posts of the heavens: the constellations.

We were as if at the bottom of some inconceivably Gargantuan pit, or on an ocean floor, thousands of miles across, with no other means of finding our bear-

ings than by placing all trust in our guide. We were at his mercy, as cut away from civilization as though we were on the last planet of the last star in a spiral nebulæ, rather than upon the outer planetoid of the solar system.

Every obstruction was coated thickly with the nocturnal growths of the Umbra; no matter which way we turned we saw hummocks of blue mold and drifts of fungus, interspersed with an occasional wraith that resolved, upon approach, into an X-ray tree. Everything we perceived looked eternally alike.

Is there any wonder despair settled around my heart like a clutching hand of ice? When Eric Stone peered around at the mantling darkness, he must have shuddered at the very thought of relinquishing his weapon.

"You don't know what you're asking," he stated flatly.

Jules Cathin grimaced, leaned over, and jerked the holstered dissembler gun from its snap at our guide's waist. It scattered a spume of fuzz as it arched toward me.

"A nice night we're having," commented Jules sarcastically. "You won't be needing this little toy, Eric, with Kalutu to protect you. Take it, Throkley, and see if it makes little red and green sparks."

"It's over ten miles back to the post," said Eric Stone hollowly, "and that's a vast distance on Euthan."

"We'll not risk your treachery," proclaimed Jules decisively.

I STOOPED OVER and picked up the weapon. At first Jules' meaning was obscure; then I met his commanding glare and was aware of the terror-stricken awe in Eric Stone's gaze. The wind bit into my throat and winged spores tickled my nostrils and the hairs of my face. After a moment's hesitation, I laid the gun down on the crest of a drift of blue mold and drew my own. It seemed hideous to destroy the weapon out here in the primitive waste lands of Euthan, but the situation demanded drastic measures.

A tiny violet striation was marked against the dark, needling from the dissembler blast in my hand. A mushrooming flare of metallic particles licked up vaporously, was gone. The fresh patch of bare rock, pitted in the blue mold, marked where the weapon had been, while a gust of wind was already bringing a steady trickle of fresh spores into the raw gash.

Eric Stone just stood there, his small mouth twisting, but he said nothing.

"You see it," said Jules Cathin. "It's like the nose on your face. We got the guns. You're not going unarmed into the dark, so you can depend on us for protection. We're going to keep the blasters, so you lead us out."

At the time, it seemed the only way. Eric Stone shrugged, said something unintelligible to Kalutu, and together they started along the trail. His tiny mouth was compressed to a mere white gash. For the first time I suspected that some exacting reason other than natural antipathy prompted his reluctance to aid us. He stalked along, following the bestial Euthanian. When he spoke, his voice drifted back to us, vibrant with emotion.

"What makes you terrestrials so unbearably curious, so cruelly dominant?" he demanded bitterly. "Aren't you satisfied with your own worlds? Can't you let other beings alone? The Euthanians are happier left to themselves. They don't want interference. You think you will not hurt them, but you will, Jules Cathin, mark that! I know the Earth Trading Co., and I know why you have come.

"You will mark the first of a tide of incoming adventurers, who will turn the peace and contentment of Euthan to turmoil. Some day, Jules, you'll know that the terrestrials and Euthanians, despite physical resemblances, are farther

apart than the voids through which their worlds hurl."

Jules Cathin laughed unbelievingly and slipped the face plate down into his helmet, shutting off further verbal communication. I followed his lead, for my nostrils were beginning to feel stuffy; the acrid bittersweet aroma of nocturnal winds becomes sour and almost unbearable when inhaled directly. Yet sometimes, when a man speaks, he has a way of conveying the fact that what he says is true.

Eric Stone had spoken like that then. It made me remember the few photographs I had seen of the Euthanians—they were tall well-shaped people, of a light-tan pigmentation. The native tribesmen were quite unlike Kalutu, who must have been of a different race. Or perhaps he was a hereditary throwback, I decided. I have heard of such individuals.

Glaring through the visor, I looked upon a bleak and dismal world. The spores kept catching on the glassite and had to be rubbed off. Our return was made more perilous by the dull lethargy that had crept over our little party.

AT LAST, we were at the cliff marking the ancient site of the Night Nomads, and were venturing beyond, into unfathomable distances, out across Cimmerian dark toward the tiny speck that would be the trading post. The half-naked Kalutu led the way. When wing spores gathered on his body, he shook like a dog, and went on unaffectedly. To all outward appearances his resentment toward Jules Cathin was forgotten.

My feet were like casts of lead, detached from my legs, plodding on and on. The incessant drag of obstructing fungus weighted them down beyond belief. It was a task to draw each foot up from the vegetative mire that clung as though reluctant to let go. Every muscle of my body was sore. My thoughts rioted.

Perhaps I should not have been surprised. Eric Stone had warned us of the giant moths. We were soon to know that he hadn't lied about them, at least. A shadowy object hurtled down without warning, almost directly in front of me. Through the visor goggles I caught a mere glimpse of black, translucent wings, gleaming iridescently, a massive thorax as large as the fuselage of an airplane, with scaly legs hanging pendent. It plummeted straight toward me, deflected to the right, and swept out into the dark again.

The others were shouting something incoherent. Something struck me a resounding blow between the shoulders from behind. The breath was knocked from my lungs; I slumped over to my knees, with the world spinning madly around. Again came the kaleidoscopic outline of an immense winged insect, with serrated wings and long hooked feet, oddly like a monstrous bat, zooming out of the depths of the heavens. Monstrous faceted eyes, over a yard in concave diameter, loomed like twin battering-rams. The bat-moths!

Fighting to gain my balance, I came erect, but the ground surface was strangely unstable. The terrain appeared to roll from under my numbed limbs, and one foot slid deep, encountering no resisting solid. Liquid sloshed up into my visor plate, dimming everything, and a sensation as of cold liquid oxygen raced down my spine. Cold fear paralyzed every nerve. An ominous sound, like the crushing of rotten bark, came rasping out of the eternal night, penetrating even the metal walls of the chitonium armor.

I was stumbling over the very edge of a pot pool. My memories are not cohesive of that moment when unutterable repugnance chilled the blood in my veins and rendered my body an impotent mass of quivering flesh. Vaguely I recall seeing Eric Stone's face, with his mouth opened as though he were shouting hys-

terically. Again an invisible hammer thudded into my back, and I sprawled into the blue mold, extinguishing the hand beam as I fell.

THE dense blackness of Hades swam thickly over me, but I felt no further concussions. I lay in a mass of crushed fungus, though it was entirely evident that solid soil was directly below. My mind, coming out of a dead stop, got off with a start like wildfire, and I rolled frantically sidewise, to avoid any close pursuers. If I had known how close I was to the edge of that swirling pool, I should never have moved an inch. I was propped on my back, both hands braced at my sides, when a tiny spark came out of the black.

I will have difficulty in describing what I saw. A yawning fissure had opened in the ground surface directly before me; thick black liquid seethed turbulently in the opening gap, as though arriving from some subterranean source deep in the bowels of Euthan.

There are some scientists of repute who hold that Euthan is essentially a liquid planet, that the continents float like corks on a denser liquid core. Perhaps it is a false belief. But it seemed so then. Only those who have actually witnessed the breaking of a pot pool on Euthan will understand what my words try to convey so inadequately.

It was as though a liquid wedge drove upward, thrusting the earth aside. Beyond the abyss of dark waters, a mass of matter was retreating slowly. Standing erect before the very edge, was Jules Cathin. He had lighted a small lantern, and stood with its reflected beam swung up into the sky. Shapeless masses fluttered across the upturned glow.

A dark body materialized out of the dark, stumbling across my legs. I jerked up the face plate.

"Eric Stone!"

"Throkley! It's you. Lucky you shut off that light. That fool doesn't know it will draw the moths. Jules. Jules!" He was shouting now. Fear transformed his voice. It sounded almost feminine, so shrill as to be almost incoherent.

"He'll be all right," I ejaculated wildly. "He's downing them with the blaster."

Eric Stone cursed. Jules Cathin stood, feet braced, his dissembler blast swinging in a free hand, while the great bat-moths fluttered down before the disintegrating lash of the atomic emanation. The continuous detonation of the blast dissembler sounded like the dry crackle of lightning.

"There are myriads of them!" gasped the trader. "He must extinguish the light before they overwhelm him. Where is Kalutu? Kalutu!" He whirled with frantic haste, searching the night. "Kalutu! He's gone. Good Lord, Throkley, he's gone."

"You mean he'll go after Jules?"

"Cosmic eternity! It mustn't be. Throkley, we've got to——"

His voice was lost in a crescendo of the wind. Out across raging waters I could see Jules Cathin, standing almost motionless, but all of a sudden his light went out, and a higher note of human desperation wailed across the wings of the wind.

Eric Stone reached wiry hands down, pulled me upright.

"Hurt?"

"Not much. I came near spraining an ankle."

"Then shout for Jules Cathin to go back from the edge. There's no use trying to recall the native. And pray Heaven that he hears!"

WE STOOD there in the dark, with spores scudding past our faces, our lungs bursting with exertion, and each sound from our throats seemed to be sucked up and lost in the wind. Dark and terror conspired to conjure up horrible pictures of Kalutu and Jules Ca-

thin, struggling until life had departed from one of them, out in that howling sea of oblivion.

"I have my hand beam," I announced, during a brief respite while we regained our breath. "It's fastened to my belt. Perhaps we——"

"Not yet, Throkley!" cried the Euthanian trader, seizing my wrist, even as it sought the luxobe attachment. "Those moths have to come toward the light. They *have* to! Light rays direct their movements and compel them to turn toward the source of light automatically."

"Phototropism," I exclaimed. "I hadn't thought of that." I realized now why the insects had attacked me from the sky. Gigantic though these moths were, they were not carnivorous. The muscles of the body are always taut, to maintain normal bodily conditions. If one side of the brain is damaged, the muscles on the opposite side of the body lose their tension, and when an animal in this condition tries to walk, it will move in a circle. When light falls sidewise on an insect, it starts chemical changes in one of the eyes. The photochemical change affects one side of the brain, reducing the tension of the muscles. The moth is not attracted by the flame, but is compelled against its wishes to flutter down into the rays of light.

"Yes," returned Eric Stone. "Forced movements."

"How about two lights then, some distance apart?"

"It will work fairly well. The effect of the two lights will tend to cause the moths to fly between them, since each eye will be equally illumined, and the bodily paralysis will be balanced. Throkley, you were an intimate of Cathin's on Earth. I wonder if you will believe that I am one of his closest friends."

I waited a moment before I spoke.

"Somehow I do," I answered, "though everything is against it. He spoke of you often before we came, but I don't comprehend why you thwart his——"

Eric Stone's hand gripped my arm hard then.

"Then do you know why Cathin came to Euthan?" he asked, and his voice trembled.

"Yes, indirectly. I've always supposed some other reason than that the company wanted information into the habits of the Euthanians prompted him to throw up a comfortable job on Earth. He lived with them once, didn't he? I think there was somebody, a woman of the tribe——"

"There was," admitted Eric Stone. "He must have wished to see her again. He's getting along in years, you know. I knew all about—him and her. Somehow I've aways felt that he'd come back. Each of them had—the little green stone. It was a meteorite at first—or what was left of it. They found it here, and broke it in twain. He went away, but I guessed that he'd return. Listen, Throkley—Kalutu must not be allowed to kill Jules Cathin! Do you understand?"

"Look here, Stone! You don't mean——"

"I don't mean a thing! I only suspect. Kalutu isn't like those others, is he? When he first came, an outcast, a lonely waif of a primitive world, I took him in at the trading post. The other natives will have nothing to do with him. I thought he must have been some sort of an atavistic throwback. He's different from the rest; he's ugly and primitive, but he has one quality no other Euthanian ever had—loyalty. It's a small clue to form any conclusion—but I've seen a lot of the universe, and that's one characteristic that marks only terrestrial blood.

"It may be a foolish whim, but now you see why you must help me keep Kalutu from him."

"I'll do what I can," I promised. His hand gripped mine fiercely.

"After I leave, count to thirty, and then light up," he said tersely, and was gone into the abysmal night. There was no denying his courage. It took all I had to stand there motionless. Like an automaton, I voiced the numbers, pressed the hand beam.

THE TWIN CONES of light bit into the darkness, illuminating a full hundred feet of the blue mold where it skirted the gap of the pot pool. For a moment, I stood blinking. Something stirred along the shore between us, a formless thing that resolved into a shaggy monster. It was Kalutu.

When the beast sighted Eric, it ran toward him, its ungainly form strangely graceful as it sped through the thick fungus. One glance at that tapered head and I decided that Eric Stone was mad. Nothing human could have begot that; besides, the nomadic Euthanians were reputed for their beautiful bodies.

Only an instant passed before a swarm of the bat-moths were arcing down, circling our heads, or swooping through the expanse between us. With two lights to affect their eyes, they did not plummet down toward my hand beam as before, although frequently they collided into X-ray trees or were swept down into the frothing current of the pot pool.

A familiar voice halloed out of the night. "Throkley. That you?"

The tones came from a distance. I could see the shore line at the opposite edge of the pot pool, but now I could discern something that had been hidden from view before. Jules Cathin was standing on a tiny island, a floating bit of matter held in the center of the maelstrom. The upper crust that had fallen away had carried him along with it.

Even as I watched, I saw that it was being slowly submerged. Jules was frightened; there was no denying that. He had ripped his helmet entirely away, and his blond hair stood up in flaring disarray. His hands sagged loosely in the empty air. Heaven knows it was enough to test the sanity of any man.

"Throkley!" he called again. "That you, Stone? And that damned monster, Kalutu! It looks pretty bad, but I can take it standing up. Every one gets his turn, sooner or later. I would have liked to have seen Uera though, before I cashed in." His voice was faint, but the wind carried it along. A lump came in my throat.

"Don't become panicky!" screamed Eric Stone. "Stand as quietly as possible, Jules." He sounded hopeful. I turned in time to see the savage Euthanian moving from the trader's side. He glanced repeatedly back at his master, and each time, Eric Stone pointed across to the sinking crust. The ugly head turned forward; mighty sinews bunched and thrust the malformed body far out into the milling pond. Black waters lashed avidly upward and grasped at this new offering.

I stared till my eyes smarted, watching each vicious current, each violent backlash. Finally, an indistinct patch of motion became apparent, churning against the middle of the current. It seemed impossible that even the leathery muscles of the native could have withstood the churning tow of subterranean tides.

Long minutes passed. Then Kalutu struggled up over the edge of the flotsam, dripping but triumphant. Without warning, he sprang upon Jules Cathin; after a brief struggle, their locked bodies toppled back into the ebon mill race.

Overhead, the opaque heavens were crawling with bat-winged forms, and down below, two chit-armored terrestrials stood as though graven from stone. Behind us, X-ray trees waved lurid branches. The weird fungus of

Euthan formed a fringe for the bluish-green mold of the Umbra.

It was unearthly. Reality centered upon those partially submerged figures, fighting desperately across the furious backlash of the newly formed pot pool. How many times they approached comparative safety and were swept back, I do not know, and much time must have passed before I dragged the limp form of Jules Cathin back upon substantial soil. Water fairly poured from his nostrils as I rendered first aid, but it was apparent that he was very much alive.

WHEN his eyes opened again, his first words were for the denizen of Euthan.

"I owe something to Kalutu," he gasped weakly, but I shook my head. "That ugly devil! He must be human after all."

"No need to worry about that," I said. "He's dead."

Unashamed tears stood in the eyes of Eric Stone as he gazed down on the lifeless form of the Euthanian throwback. He had been kneeling above the recumbent monster, but now he arose, his eyes fixed upon an object in his hand.

"Ready to travel?" he asked.

"I can help Cathin along," I replied. "It's too bad—about the Euthanian."

His gray eyes fixed upon mine.

"Perhaps he should never know."

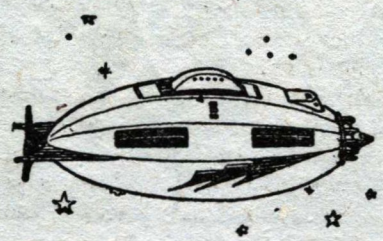
"It was a fine thing to do. I think we'd better get back to the trading post as quickly as possible."

"I found this," said Eric Stone quietly, indicating the tiny object in the palm of his extended chit-gloved hand. "It was tied in the lining of Kalutu's meager clothing. You see what it is? There are only two such.

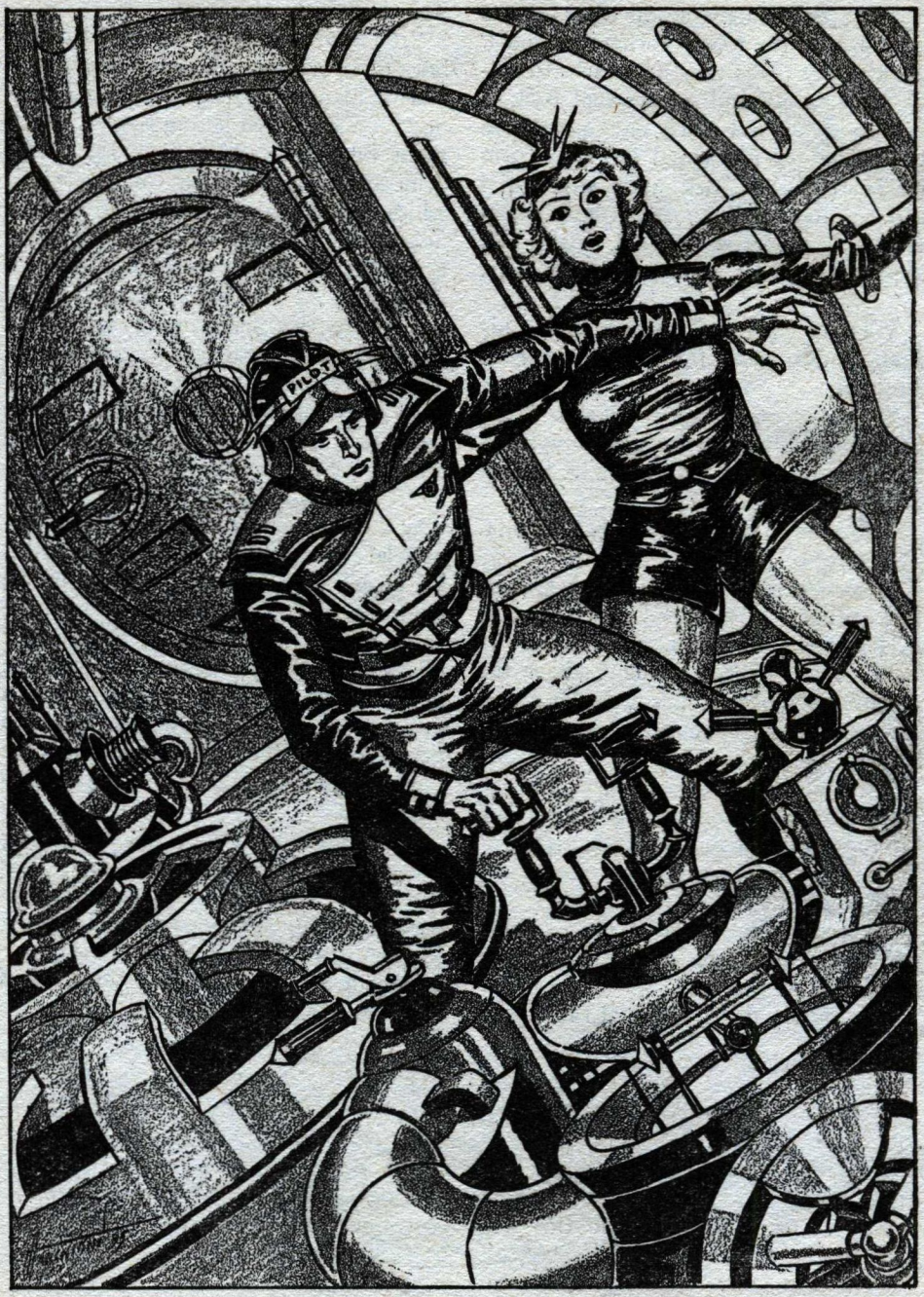
"It's hard to believe, but you know the laws of hybridity. Each species of animal or plant is characterized by a definite number of cell chromosomes, which recur in every cell of the body. Hybridization is the union of organisms which contain an unlike number of chromosomes. When the fertile cells unite, a number of the chromosomes must go unmated. As you know, these chromosomes are the determining factors of physical and mental traits. Thus it results in certain inherent qualities being exterpated through hybridization. Often animals of very differing forms are created by mating unlike species.

"Kalutu is a hybrid. Don't you see that these Euthanians, however like terrestrials in superficial resemblance, must be essentially different? Even if we presume that they originated from the same source of life spores, floating out of the early chaos of space, the evolutive adaptions of two planets must vary to a vast extent. It would be too much to presume that the chromosomes of the terrestrial cell would match the Euthanian cell."

Eric Stone turned on his heel, flung the diminutive pebble from him. The hungry waters of the subterranean oceans of Euthan rippled and shimmered in the hand beam's glow, to become quiescent again as the ebon tides rolled over—the little green stone.



Redemption Cairn



I slapped her hands—hard—pushed her away—grabbed the U-bar.

by Stanley G. Weinbaum

Here is one of the last stories by one of the outstanding writers of science-fiction. Remember him as you read it

HAVE YOU ever been flat broke, hungry as the very devil, and yet so down and out that you didn't even care? Looking back now, after a couple of months, it's hard to put it into words, but I think the low point was the evening old Captain Harris Henshaw dropped into my room—my room, that is, until the twenty-four-hour notice to move or pay up expired.

There I sat, Jack Sands, ex-rocket pilot. Yeah, the same Jack Sands you're thinking of, the one who cracked up the Gunderson Europa expedition trying to land at Young's Field, Long Island, in March, 2110. Just a year and a half ago! It seemed like ten and a half. Five hundred idle days. Eighteen months of having your friends look the other way when you happened to pass on the street, partly because they're ashamed to nod to a pilot that's been tagged yellow, and partly because they feel maybe it's kinder to just let you drop out of sight peacefully.

I didn't even look up when a knock sounded on my door, because I knew it could only be the landlady. "Haven't got it," I growled. "I've got a right to stay out my notice."

"You got a right to make a damn fool of yourself," said Henshaw's voice. "Why don't you tell your friends your address?"

"Harris!" I yelled. It was "Captain" only aboard ship. Then I caught myself. "What's the matter?" I asked, grinning bitterly. "Did you crack up, too? Coming to join me on the dust heap, eh?"

"Coming to offer you a job," he growled.

"Yeah? It must be a swell one, then. Carting sand to fill up the blast pits on a field, huh? And I'm damn near hungry enough to take it—but not quite."

"It's a piloting job," said Henshaw quietly.

"Who wants a pilot that's been smeared with yellow paint? What outfit will trust its ships to a coward? Don't you know that Jack Sands is tagged forever?"

"Shut up, Jack," he said briefly. "I'm offering you the job as pilot under me on Interplanetary's new Europa expedition."

I started to burn up then. You see, it was returning from Jupiter's third moon, Europa, that I'd smashed up the Gunderson outfit, and now I got a wild idea that Henshaw was taunting me about that. "By Heaven!" I screeched. "If you're trying to be funny——"

But he wasn't. I quieted down when I saw he was serious, and he went on slowly, "I want a pilot I can trust, Jack. I don't know anything about your cracking up the *Hera;* I was on the Venus run when it happened. All I know is that I can depend on you."

AFTER A WHILE I began to believe him. When I got over the shock a little, I figured Henshaw was friend enough to be entitled to the facts.

"Listen, Harris," I said. "You're taking me on, reputation and all, and it looks to me as if you deserve an explanation. I haven't been whining about the bump I got, and I'm not now. I cracked up Gunderson and his outfit all right, only"—I hesitated; it's kind of tough to feel that maybe you're

squirming in the pinch—"only my co-pilot, that fellow Kratska, forgot to mention a few things, and mentioned a few others that weren't true. Oh, it was my shift, right enough, but he neglected to tell the investigating committee that I'd stood his shift and my own before it. I'd been on for two long shifts, and this was my short one."

"Two long ones!" echoed Henshaw. "You mean you were on sixteen hours before the landing shift?"

"That's what I mean. I'll tell you just what I told the committee, and maybe you'll believe me. They didn't. But when Kratska showed up to relieve me he was hopped. He had a regular hexylamine jag, and he couldn't have piloted a tricycle. So I did the only possible thing to do; I sent him back to sleep it off, and I reported it to Gunderson, but that still left me the job of getting us down.

"It wouldn't have been so bad if it had happened in space, because there isn't much for a pilot to do out there except follow the course laid out by the captain, and maybe dodge a meteor if the alarm buzzes. But I had sixteen solid hours of teetering down through a gravitational field, and by the time my four-hour spell came around I was bleary."

"I don't wonder," said the captain. "Two long shifts!"

Maybe I'd better explain a rocket's pilot system. On short runs like Venus or Mars, a vessel could carry three pilots, and then it's a simple matter of three eight-hour shifts. But on any longer run, because air and weight and fuel and food are all precious, no rocket ever carries more than two pilots.

So a day's run is divided into four shifts, and each pilot has one long spell of eight hours, then four hours off, then four hours on again for his short shift, and then eight hours to sleep. He eats two of his meals right at the control desk, and the third during his short free period. It's a queer life, and sometimes men have been co-pilots for years without really seeing each other except at the beginning and the end of their run.

I went on with my story, still wondering whether Henshaw would feel as if I were whining. "I was bleary," I repeated, "but Kratska showed up still foggy, and I didn't dare trust a hexylamine dope with the job of landing. Anyway, I'd reported to Gunderson, and that seemed to shift some of the responsibility to him. So I let Kratska sit in the control cabin, and I began to put down."

Telling the story made me mad all over. "Those lousy reporters!" I blazed. "All of them seemed to think landing a rocket is like settling down in bed; you just cushion down on your underblast. Yeah; they don't realize that you have to land blind, because three hundred feet from the ground the blast begins to splash against it.

"You watch the leveling poles at the edge of the field and try to judge your altitude from them, but you don't see the ground; what you see under you are the flames of Hell. And another thing they don't realize: lowering a ship is like bringing down a dinner plate balanced on a fishing rod. If she starts to roll sideways—blooey! The underjets only hold you up when they're pointing down, you know."

HENSHAW let me vent my temper without interruption, and I returned to my story. "Well, I was getting down as well as could be expected. The *Hera* always did have a tendency to roll a little, but she wasn't the worst ship I've put to ground.

"But every time she slid over a little, Kratska let out a yell; he was nervous from his dope jag, and he knew he was due to lose his license, and on top of that he was just plain scared by the

side roll. We got to seventy feet on the leveling poles when she gave a pretty sharp roll, and Kratska went plain daffy."

I hesitated. "I don't know exactly how to tell what happened. It went quick, and I didn't see all of it, of course. But suddenly Kratska, who had been fumbling with the air lock for ten minutes, shrieked something like 'She's going over!' and grabbed the throttle. He shut off the blast before I could lift an eyelash, shut it off and flung himself out. Yeah; he'd opened the air lock.

"Well, we were only seventy feet—less than that—above the field. We dropped like an overripe apple off a tree. I didn't have time even to move before we hit, and when we hit, all the fuel in all the jets must have let go. And for what happened after that you'd better read the newspapers."

"Not me," said Henshaw. "You spill it."

"I can't, not all of it, because I was laid out. But I can guess, all right. It seems that when the jets blew off, Kratska was just picked up in a couple of cubic yards of the soft sand he had landed in, and tossed clear. He had nothing but a broken wrist. And as for me, apparently I was shot out of the control room, and banged up considerably. And as for Gunderson, his professors, and every one else on the *Hera*—well, they were just stains on the pool of molten ferralumin that was left."

"Then how," asked Henshaw, "did they hang it on you?"

I tried to control my voice. "Kratska," I said grimly. "The field was clear for landing; nobody can stand in close with the blast splashing in a six-hundred-foot circle. Of course, they saw some one jump from the nose of the ship after the jets cut off, but how could they tell which of us? And the explosion shuffled the whole field around, and nobody knew which was what."

"Then it should have been his word against yours."

"Yeah; it should have been. But the field knew it was my shift because I'd been talking over the landing beam, and besides, Kratska got to the reporters first. I never even knew of the mess until I woke up at Grand Mercy Hospital thirteen days later. By that time Kratska had talked and I was the goat."

"But the investigating committee?"

I grunted. "Sure, the investigating committee. I'd reported to Gunderson, but he made a swell witness, being just an impurity in a mass of ferralumin alloy. And Kratska had disappeared, anyway."

"Couldn't they find him?"

"Not on what I knew about him. We picked him up at Junopolis on Io, because Briggs was down with white fever. I didn't see him at all except when we were relieving each other, and you know what that's like, seeing somebody in a control cabin with the sun shields up. And on Europa we kept to space routine, so I couldn't even give you a good description of him. He had a beard, but so have ninety per cent of us after a long hop, and he said when we took him on that he'd just come over from the Earth." I paused. "I'll find him some day."

"Hope you do," said Henshaw briskly. "About this present run, now. There'll be you and me, and then there'll be Stefan Coretti, a physical chemist, and an Ivor Gogrol, a biologist. That's the scientific personnel of the expedition."

"Yeah, but who's my co-pilot? That's what interests me."

"Oh, sure," said Henshaw, and coughed. "Your co-pilot. Well, I've been meaning to tell you. It's Claire Avery."

"Claire Avery!"

"That's right," agreed the captain gloomily. "The Golden Flash herself. The only woman pilot to have her name on the Curry cup, winner of this year's Apogee race."

"She's no pilot!" I snapped. "She's a rich publicity hound with brass nerves. I was just curious enough to blow ten bucks rental on a 'scope to watch that race. She was ninth rounding the Moon. Ninth! Do you know how she won? She gunned her rocket under full acceleration practically all the way back, and then fell into a braking orbit.

"Any sophomore in Astronautics II knows that you can't calculate a braking orbit without knowing the density of the stratosphere and ionosphere, and even then it's a gamble. That's what she did—simply gambled, and happened to be lucky. Why do you pick a rich moron with a taste for thrills on a job like this?"

"I didn't pick her, Jack. Interplanetary picked her for publicity purposes. To tell the truth, I think this whole expedition is an attempt to get a little favorable advertising to offset that shady stock investigation this spring. Interplanetary wants to show itself as the noble patron of exploration. So Claire Avery will take off for the television and papers, and you'll be politely ignored."

"And that suits me! I wouldn't even take the job if things were a little different, and——" I broke off suddenly, frozen. "Say," I said weakly, "did you know they'd revoked my license?"

"You don't say," said Henshaw. "And after all the trouble I had talking Interplanetary into permission to take you on, too." Then he grinned. "Here," he said, tossing me an envelope. "See how long it'll take you to lose this one."

But the very sight of the familiar blue paper was enough to make me forget a lot of things—Kratska, Claire Avery, even hunger.

II.

THE TAKE-OFF was worse than I had expected. I had sense enough to wear my pilot's goggles to the field, but of course I was recognized as soon as I joined the group at the rocket. They'd given us the *Minos,* an old ship, but she looked as if she'd handle well.

The newsmen must have had orders to ignore me, but I could hear plenty of comments from the crowd. And to finish things up, there was Claire Avery, a lot prettier than she looked on the television screens, but with the same unmistakable cobalt-blue eyes, and hair closer to the actual shade of metallic gold than any I'd ever seen. The "Golden Flash," the newsmen called her. Blah!

She accepted her introduction to me with the coolest possible nod, as if to say to the scanners and cameras that it wasn't her choice she was teamed with yellow Jack Sands. But for that matter, Coretti's black Latin eyes were not especially cordial either, nor were Gogrol's broad features. I'd met Gogrol somewhere before, but couldn't place him at the moment.

Well, at last the speeches were over, and the photographers and broadcast men let the Golden Flash stop posing, and she and I got into the control cabin for the take-off. I still wore my goggles, and huddled down low besides, because there were a dozen telescopic cameras and scanners recording us from the field's edge. Claire Avery simply ate it up, though, smiling and waving before she cut in the underblast. But finally we were rising over the flame.

She was worse than I'd dreamed. The *Minos* was a sweetly balanced ship, but she rolled it like a baby's cradle. She had the radio on the field broadcast, and I could hear the description of the take-off: "—heavily laden. There—she rolls again. But she's making altitude. The blast has stopped

splashing now, and is coming down in a beautiful fan of fire. A difficult take-off, even for the Golden Flash." A difficult take-off! Bunk!

I was watching the red bubble in the level, but I stole a glance at Claire Avery's face, and it wasn't so cool and stand-offish now. And just then the bubble in the level bobbed way over, and I heard the girl at my side give a frightened little gasp. This wasn't cradle rocking any more; we were in a real roll!

I slapped her hands hard and grabbed the U-bar. I cut the underjets completely off, letting the ship fall free, then shot the full blast through the right laterals. It was damn close, I'm ready to swear, but we leveled, and I snapped on the underblast before we lost a hundred feet of altitude. And there was that inane radio still talking: "They're over! No—they've leveled again, but what a roll! She's a real pilot, this Golden Flash——"

I looked at her; she was pale and shaken, but her eyes were angry. "Golden Flash, eh?" I jeered. "The gold must refer to your money, but what's the flash? It can't have much to do with your ability as a pilot." But at that time I had no idea how pitifully little she really knew about rocketry.

She flared. "Anyway," she hissed, her lips actually quivering with rage, "the gold doesn't refer to color, Mr. Malaria Sands!" She knew that would hurt; the "Malaria" was some bright columnist's idea of a pun on my name. You see, malaria's popularly called Yellow Jack. "Besides," she went on defiantly, "I could have pulled out of that roll myself, and you know it."

"Sure," I said with the meanest possible sarcasm. We had considerable upward velocity now, and plenty of altitude, both of which tend toward safety because they give one more time to pull out of a roll. "You can take over again now. The hard part's over."

She gave me a look from those electric blue eyes, and I began to realize just what sort of trip I was in for. Coretti and Gogrol had indicated their unfriendliness plainly enough, and heaven knows I couldn't mistake the hatred in Claire Avery's eyes, so that left just Captain Henshaw. But the captain of a ship dare not show favoritism, so all in all I saw myself doomed to a lonely trip.

LONELY isn't the word for it. Henshaw was decent enough, but since Claire Avery had started with a long shift and so had the captain, they were having their free spells and meals on the same schedule, along with Gogrol, and that left me with Coretti. He was pretty cool, and I had pride enough left not to make any unwanted advances.

Gogrol was worse; I saw him seldom enough, but he never addressed a word to me except on routine. Yet there was something familiar about him—— As for Claire Avery, I simply wasn't in her scheme of things at all; she even relieved me in silence.

Offhand, I'd have said it was the wildest sort of stupidity to send a girl with four men on a trip like this. Well, I had to hand it to Claire Avery; in *that* way she was a splendid rocketrix. She took the inconveniences of space routine without a murmur, and she was so companionable—that is, with the others—that it was like having a young and unusually entertaining man aboard.

And, after all, Gogrol was twice her age and Henshaw almost three times; Coretti was younger, but I was the only one who was really of her generation. But as I say, she hated me; Coretti seemed to stand best with her.

So the weary weeks of the journey dragged along. The Sun shrunk up to a disk only a fifth the diameter of the terrestrial Sun, but Jupiter grew to an enormous moonlike orb with its bands and spots gloriously tinted. It

was an exquisite sight, and sometimes, since eight hours' sleep is more than I can use, I used to slip into the control room while Claire Avery was on duty, just to watch the giant planet and its moons. The girl and I never said a word to each other.

We weren't to stop at Io, but were landing directly on Europa, our destination, the third moon outward from the vast molten globe of Jupiter. In some ways Europa is the queerest little sphere in the Solar System, and for many years it was believed to be quite uninhabitable. It is, too, as far as seventy per cent of its surface goes, but the remaining area is a wild and weird region.

This is the mountainous hollow in the face toward Jupiter, for Europa, like the Moon, keeps one face always toward its primary. Here in this vast depression, all of the tiny world's scanty atmosphere is collected, gathered like little lakes and puddles into the valleys between mountain ranges that often pierce through the low-lying air into the emptiness of space.

Often enough a single valley forms a microcosm sundered by nothingness from the rest of the planet, generating its own little rainstorms under pygmy cloud banks, inhabited by its indigenous life, untouched by, and unaware, of all else.

In the ephemeris, Europa is dismissed prosaically with a string of figures: diameter, 2099 M.—period, 3 days, 13 hours, 14 seconds—distance from primary, 425,160 M. For an astronomical ephemeris isn't concerned with the thin film of life that occasionally blurs a planet's surface; it has nothing to say of the slow libration of Europa that sends intermittent tides of air washing against the mountain slopes under the tidal drag of Jupiter, nor of the waves that sometimes spill air from valley to valley, and sometimes spill alien life as well.

Least of all is the ephemeris concerned with the queer forms that crawl now and then right up out of the air pools, to lie on the vacuum-bathed peaks exactly as strange fishes flopped their way out of the Earthly seas to bask on the sands at the close of the Devonian age.

OF THE FIVE OF US, I was the only one who had ever visited Europa —or so I thought at the time. Indeed, there were few men in the world who had actually set foot on the inhospitable little planet; Gunderson and his men were dead, save me and perhaps Kratska, and we had been the first organized expedition.

Only a few stray adventurers from Io had preceded us. So it was to me that Captain Henshaw directed his orders when he said, "Take us as close as possible to Gunderson's landing."

It began to be evident that we'd make ground toward the end of Claire's long shift, so I crawled out of the coffinlike niche I called my cabin an hour early, and went up to the control room to guide her down. We were seventy or eighty miles up, but there were no clouds or air distortion here, and the valleys crisscrossed under us like a relief map.

It was infernally hard to pick Gunderson's valley; the burned spot from the blast was long since grown over, and I had only memory to rely on, for, of course, all charts were lost with the *Hera*. But I knew the general region, and it really made less difference than it might have, for practically all the valleys in that vicinity were connected by passes; one could walk between them in breathable air.

After a while I picked one of a series of narrow parallel valleys, one with what I knew was a salt pool in the center—though most of them had that; they'd be desert without it—and pointed it out to Claire. "That one," I said, adding maliciously, "and I'd better warn you

that it's narrow and deep—a ticklish landing place."

She flashed me an unfriendly glance from sapphire eyes, but said nothing. But a voice behind me sounded unexpectedly: "To the left! The one to the left. It—it looks easier."

Gogrol! I was startled for a moment, then turned coldly on him. "Keep out of the control room during landings," I snapped.

He glared, muttered something, and retired. But he left me a trifle worried; not that his valley to the left was any easier to land in—that was pure bunk—but it looked a little familiar! Actually, I wasn't sure but that Gogrol had pointed out Gunderson's valley.

But I stuck to my first guess. The irritation I felt I took out on Claire. "Take it slow!" I said gruffly. "This isn't a landing field. Nobody's put up leveling poles in these valleys. You're going to have to land completely blind from about four hundred feet, because the blast begins to splash sooner in this thin air. You go down by level and guess, and Heaven help us if you roll her! There's no room for rolling between those cliffs."

She bit her lip nervously. The *Minos* was already rolling under the girl's inexpert hand, though that wasn't dangerous while we still had ten or twelve miles of altitude. But the ground was coming up steadily.

I was in a cruel mood. I watched the strain grow in her lovely features, and if I felt any pity, I lost it when I thought of the way she had treated me. So I taunted her.

"This shouldn't be a hard landing for the Golden Flash. Or maybe you'd rather be landing at full speed, so you could fall into a braking ellipse—only that wouldn't work here, because the air doesn't stick up high enough to act as a brake."

And a few minutes later, when her lips were quivering with tension, I said, "It takes more than publicity and gambler's luck to make a pilot, doesn't it?"

She broke. She screamed suddenly, "Oh, take it! Take it, then!" and slammed the U-bar into my hands. Then she huddled back in her corner sobbing, with her golden hair streaming over her face.

I took over; I had no choice. I pulled the *Minos* out of the roll Claire's gesture had put her in, and then started teetering down on the underjets. It was pitifully easy because of Europa's low gravitation and the resulting low falling acceleration; it gave the pilot so much time to compensate for side sway.

I began to realize how miserably little the Golden Flash really knew about rocketry, and, despite myself, I felt a surge of pity for her. But why pity her? Every one knew that Claire Avery was simply a wealthy, thrill-intoxicated daredevil, with more than her share of money, of beauty, of adulation. The despised Jack Sands pitying her? That's a laugh!

The underblast hit and splashed, turning the brown-clad valley into black ashes and flame. I inched down very slowly now, for there was nothing to see below save the fiery sheet of the blast, and I watched the bubble on the level as if my life depended on it—which it did.

I knew the splash began at about four hundred feet in this density of air, but from then on it was guesswork, and a question of settling down so slowly that when we hit we wouldn't damage the underjets. And if I do say it, we grounded so gently that I don't think Claire Avery knew it until I cut off the blast.

She rubbed the tears away with her sleeve and glared blue-eyed defiance at me, but before she could speak, Henshaw opened the door. "Nice landing, Miss Avery," he said.

"Wasn't it?" I echoed with a grin at the girl.

She stood up. She was trembling, and I think that under Earthly gravitation she would have fallen back into the pilot's seat, for I saw her knees shaking below her trim, black shorts.

"I didn't land us," she said grimly. "Mr. Sands put us to ground."

Somehow my pity got the best of me then. "Sure," I said. "It's into my shift. Look." It was; the chonometer showed three minutes in. "Miss Avery had all the hard part——"

But she was gone. And try as I would, I could not bring myself to see her as the hard, brilliant thrill seeker which the papers and broadcasts portrayed her. Instead, she left me with a strange and by no means logical impression of—wistfulness.

III.

LIFE on Europa began uneventfully. Little by little we reduced the atmospheric pressure in the *Minos* to conform to that outside. First Coretti and then Claire Avery had a spell of altitude sickness, but by the end of twenty hours we were all acclimated enough to be comfortable outside.

Henshaw and I were first to venture into the open. I scanned the valley carefully for familiar landmarks, but it was hard to be sure; all these canyonlike ditches were much alike. I knew that a copse of song-bushes had grown high on the cliff when the *Hera* had landed, but our blast had splashed higher, and if the bushes had been there, they were only a patch of ashes now.

At the far end of the valley there should have been a cleft in the hills, a pass leading to the right into the next valley. That wasn't there; all I could distinguish was a narrow ravine cutting the hills to the left.

"I'm afraid I've missed Gunderson's valley," I told Henshaw. "I think it's the next one to our left; it's connected to this one by a pass, if I'm right, and this is one I came in several times to hunt." It recurred to me suddenly that Gogrol had said the left one.

"You say there's a pass?" mused Henshaw. "Then we'll stay here rather than chance another take-off and another landing. We can work in Gunderson's valley through the pass. You're sure it's low enough so we won't have to use oxygen helmets?"

"If it's the right pass, I am. But work at what in Gunderson's valley? I thought this was an exploring expedition."

Henshaw gave me a queer, sharp look, and turned away. Right then I saw Gogrol standing in the port of the *Minos*, and I didn't know whether Henshaw's reticence was due to his presence or mine. I moved a step to follow him, but at that moment the outer door of the air lock opened and Claire Avery came out.

It was the first time I had seen her in a fair light since the take-off at Young's Field, and I had rather forgotten the loveliness of her coloring. Of course, her skin had paled from the weeks in semidarkness, but her cadmium-yellow hair and sapphire-blue eyes were really startling, especially when she moved into the sun shadow of the cliff and stood bathed only in the golden Jupiter light.

Like Henshaw and myself, she had slipped on the all-enveloping ski suit one wore on chilly little Europa. The small world received only a fourth as much heat as steamy Io, and would not have been habitable at all, except for the fact that it kept its face always toward its primary, and therefore received heat intermittently from the Sun, but eternally from Jupiter.

The girl cast an eager look over the valley; I knew this was her first experience on an uninhabited world, and there is always a sense of strangeness

and the fascination of the unknown in one's first step on an alien planet.

She looked at Henshaw, who was methodically examining the scorched soil on which the *Minos* rested, and then her glance crossed mine. There was an electric moment of tension, but then the anger in her blue eyes—if it had been anger—died away, and she strode deliberately to my side.

She faced me squarely. "Jack Sands," she said with an undertone of defiance, "I owe you an apology. Don't think I'm apologizing for my opinion of you, but only for the way I've been acting toward you. In a small company like this there isn't room for enmity, and as far as I'm concerned, your past is yours from now on. What's more, I want to thank you for helping me during the take-off, and"—her defiance was cracking a bit—"d-during the—the landing."

I stared at her. That apology must have cost her an effort, for the Golden Flash was a proud young lady, and I saw her wink back her tears. I choked back the vicious reply I had been about to make, and said only, "O. K. You keep your opinion of me to yourself and I'll do the same with my opinion of you."

She flushed, then smiled. "I guess I'm a rotten pilot," she admitted ruefully. "I hate take-offs and landings. To tell the truth, I'm simply scared green of the *Minos*. Up to the time we left Young's Field, I'd never handled anything larger than my little racing rocket, the *Golden Flash*."

I gasped. That wouldn't have been credible if I hadn't seen with my own eyes how utterly unpracticed she was. "But why?" I asked in perplexity. "If you hate piloting so, why do it? Just for publicity? With your money you don't have to, you know."

"Oh, my money!" she echoed irritably. She stared away over the narrow valley, and started suddenly. "Look!" she cried. "There's something moving on the peaks—like a big ball. And way up where there's no air at all!"

I glanced over. "It's just a bladder bird," I said indifferently. I'd seen plenty of them; they were the commonest mobile form of life on Europa. But of course Claire hadn't, and she was eagerly curious.

I explained. I threw stones into a tinkling grove of song-bushes until I flushed up another, and it went gliding over our heads with its membrane stretched taut.

I told her that the three-foot creature that had sailed like a flying squirrel was the same sort as the giant ball she had glimpsed among the airless peaks, only the one on the peaks had inflated its bladder. The creatures were able to cross from valley to valley by carrying their air with them in their big, balloonlike bladders. And, of course, bladder birds weren't really birds at all; they didn't fly, but glided like the lemurs and flying squirrels of Earth, and naturally, couldn't even do that when they were up on the airless heights.

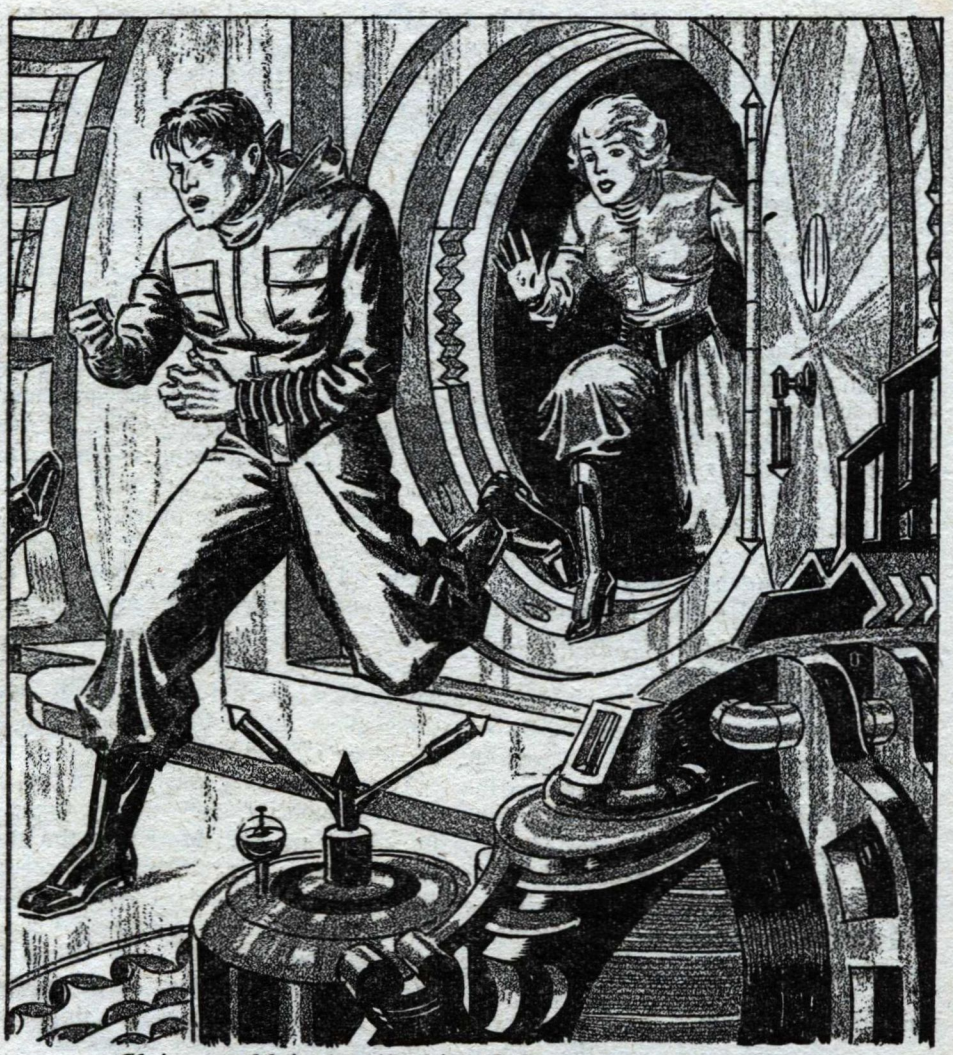
CLAIRE was so eager and interested and wide-eyed that I quite forgot my grudge. I started to show her my knowledge of things Europan; I led her close to the copse of song-bushes so that she could listen to the sweet and plaintive melody of their breathing leaves, and I took her down to the salt pool in the center of the valley to find some of the primitive creatures which Gunderson's men had called "nutsies," because they looked very much like walnuts with the hulls on. But within was a small mouthful of delicious meat, neither animal nor vegetable, which was quite safe to eat raw, since bacterial life did not exist on Europa.

I guess I was pretty exuberant, for

I think he was mad; he was screaming curses. "You can't beat me! You can't!"

after all, this was the first chance at companionship I'd had for many weeks. We wandered down the valley and I talked, talked about anything. I told her of the various forms life assumed on the planets, how on Mars and Titan and Europa sex was unknown, though Venus and Earth and Io all possessed it; and how on Mars and Europa vegetable and animal life had never differentiated, so that even the vastly intelligent beaked Martians had a tinge of vegetable nature, while conversely the song-bushes on the hills of Europa had a vaguely animal content. And meanwhile we wandered aimlessly along until we stood below the narrow pass or ravine that led presumably into Gunderson's valley to our left.

Far up the slope a movement caught my eye. A bladder bird, I thought idly, though it was a low altitude for one to inflate; they usually expanded their bladders just below the point where



Claire couldn't handle him, I knew, unless—— So I fought hazily, doggedly, until——

breathing became impossible. Then I saw that it wasn't a bladder bird; it was a man. In fact, it was Gogrol.

He was emerging from the pass, and his collar was turned up about his throat against the cold of the altitude. He hadn't seen us, apparently, as he angled down what mountaineers call a *col*, a ledge or neck of rock that slanted from the mouth of the ravine along the hillside toward the *Minos*. But Claire, following the direction of my gaze, saw him in the moment before brush hid him from view.

"Gogrol!" she exclaimed. "He must have been in the next valley. Stefan will want——" She caught herself sharply.

"Why," I asked grimly, "should your friend Coretti be interested in Gogrol's actions? After all, Gogrol's supposed to be a biologist, isn't he? Why shouldn't he take a look in the next valley?"

Her lips tightened. "Why shouldn't he?" she echoed. "I didn't say he shouldn't. I didn't say anything like that."

And thenceforward she maintained a stubborn silence. Indeed, something of the old enmity and coolness seemed to have settled between us as we walked back through the valley toward the *Minos*.

That night Henshaw rearranged our schedule to a more convenient plan than the requirements of space. We divided our time into days and nights, or rather into sleeping and waking periods, for, of course, there is no true night on Europa. The shifts of light are almost as puzzling as those on its neighbor Io, but not quite, because Io has its own rotation to complicate matters.

On Europa, the nearest approach to true night is during the eclipse that occurs every three days or so, when the landscape is illumined only by the golden twilight of Jupiter, or at the most, by only Jupiter and Io light. So we set our own night time by arbitrary Earth reckoning, so that we might all work and sleep during the same periods.

There was no need for any sort of watch to be kept; no one had ever reported life dangerous to man on little Europa. The only real danger came from the meteors that swarm about the giant Jupiter's orbit, and sometimes came crashing down through the shallow air of his satellites; we couldn't dodge them here as we could in space. But that was a danger against which a guard was unavailing.

IT WAS the next morning that I cornered Henshaw and forced him to listen to my questions.

"Listen to me, Harris," I said determinedly. "What is there about this expedition that everybody knows but me? If this is an exploring party, I'm the Ameer of Yarkand. Now I want to know what it's all about."

Henshaw looked miserably embarrassed. He kept his eyes away from mine, and muttered unhappily, "I can't tell you, Jack. I'm damned sorry, but I can't tell you."

"Why not?"

He hesitated. "Because I'm under orders not to, Jack."

"Whose orders?"

Henshaw shook his head. "Damn it!" he said vehemently. "I trust you. If it were my choice, you'd be the one I'd pick for honesty. But it isn't my choice." He paused. "Do you understand that? All right"—he stiffened into his captain's manner—"no more questions, then. I'll ask all the questions and give all the orders."

Well, put on that basis, I couldn't argue. I'm a pilot, first, last, and always, and I don't disobey my superior's orders even when he happens to be as close a friend as Henshaw. But I began to kick myself for not seeing something queer in the business as soon as Henshaw offered me the job.

If Interplanetary was looking for favorable publicity, they wouldn't get it by signing me on. Moreover, the government wasn't in the habit of reissuing a revoked pilot's license without good and sufficient reason, and I knew I hadn't supplied any such reason by loafing around brooding over my troubles. That alone should have tipped me off that something was screwy.

And there were plenty of hints during the voyage itself. True, Gogrol seemed to talk the language of biology, but I'll be dogged if Coretti talked like a chemist. And there was that haunting sense of familiarity about Gogrol, too. And to cap the climax was the incongruity of calling this jaunt an exploring expedition; for all the exploring we were doing we might as well have landed on Staten Island or Buffalo. Better, as far as I was concerned, because I'd seen Europa but had never been to Buffalo.

Well, there was nothing to be done about it now. I suppressed my disgust and tried as hard as I could to coöperate with the others in whatever project we were supposed to be pursuing. That was rather difficult, too, because suspicious-appearing incidents kept cropping up to make me feel like a stranger or an outcast.

There was, for instance, the time Henshaw decided that a change in diet would be welcome. The native life of Europa was perfectly edible, though not all as tasty as the tiny shell creatures of the salt pools. However, I knew of one variety that had served the men of the *Hera,* a plantlike growth consisting of a single fleshy hand-sized member, that we had called liver-leaf because of its taste.

The captain detailed Coretti and myself to gather a supply of this delicacy, and I found a specimen, showed it to him, and then set off dutifully along the north—that is, the left—wall of the valley.

Coretti appeared to take the opposite side, but I had not gone far before I glimpsed him skirting my edge of the salt pool. That meant nothing; he was free to search anywhere for liver-leaf, but it was soon evident to me that he was not searching. He was following me; he was shadowing my movements.

I was thoroughly irritated, but determined not to show it. I plodded methodically along, gathering the fat leaves in my basket, until I reached the valley's far end and the slopes below the pass. There I turned sharply back and succeeded in running square into Coretti before he could maneuver himself out of a copse of song-bushes.

He grinned at me. "Any luck?" he asked.

"More than you, it seems," I retorted, with a contemptuous look at his all but empty basket.

"I had no luck at all. I thought maybe in the next valley, through the pass there, we might find some."

"I've found my share," I grunted.

I thought I noticed a flicker of surprise in his black eyes. "You're not going over?" he asked sharply. "You're going back?"

"You guessed it," I said shortly. "My basket's full and I'm going back."

I knew that he watched me most of the way back, because halfway to the *Minos* I turned around. and I could see him standing there on the slope below the pass.

Along toward what we called evening the Sun went into our first eclipse. The landscape was bathed in the aureate light of Jupiter alone, and I realized that I'd forgotten how beautiful that golden twilight could be.

I was feeling particularly lonesome, too, so I wandered out alone to stare at the glowing peaks against the black sky, and the immense, bulging sphere of Jupiter with Ganymede swinging like a luminous pearl close beside it. The scene was so lovely that I forgot my loneliness, until I was suddenly reminded of it.

A glint of more brilliant gold caught my eye, up near the grove of song-bushes. It was Claire's head; she was standing there watching the display, and beside her was Coretti. While I looked, he suddenly turned and drew her into his arms; she put her hands against his chest, but she wasn't struggling; she was perfectly passive and content. It was none of my business, of course, but—well, if I'd disliked Coretti before, I hated him now, because I was lonely again.

IV.

I THINK it was the next day that things came to a head, and trouble really began. Henshaw had been pleased with our meal of indigenous life, and decided to try it again. This time Claire was assigned to accompany

me, and we set off in silence. A sort of echo of the coolness that had attended our last parting survived, and besides, what I had seen last night in the eclipse light seemed to make a difference to me. So I simply stalked along at her side, wondering what to choose for the day's menu.

We didn't want liver-leaves again. The little nutsies from the salt pool were all right, but it was a half day's job to gather enough, and besides, they were almost too salty to be pleasant fare for a whole meal. Bladder birds were hopeless; they consisted of practically nothing except thin skin stretched over a framework of bones. I remembered that once we had tried a brown, fungoid lump that grew in the shade under the song-bushes; some of Gunderson's men had liked it.

Claire finally broke the silence. "If I'm going to help you look," she suggested, "I ought to know what we're looking for."

I described the lumpy growths. "I'm not so sure all of us will like them. Near as I can remember, they tasted something like truffles, with a faint flavor of meat added. We tried them both raw and cooked, and cooked was best."

"I like truffles," said the girl. "They're——"

A shot! There was no mistaking the sharp crack of a .38. though it sounded queerly thin in the rare atmosphere. But it sounded again, and a third time, and then a regular fusillade!

"Keep back of me!" I snapped as we turned and raced for the *Minos*. The warning was needless; Claire was unccustomed to the difficulties of running on a small planet. Her weight on Europa must have been no more than twelve or fifteen pounds, one eighth Earth normal, and though she had learned to walk easily enough—one learned that on any space journey—she had had no opportunity to learn to run. Her first step sent her half a dozen feet into the air; I sped away from her with the long, sliding stride one had to use on such planets as Europa.

I burst out of the brush into the area cleared by the blast, where already growth had begun. For a moment I saw only the *Minos* resting peacefully in the clearing, then I reeled with shock. At the air lock lay a man—Henshaw—with his face a bloody pulp, his head split by two bullets.

There was a burst of sound, voices, another shot. Out of the open air lock reeled Coretti; he staggered backward for ten steps, then dropped on his side, while blood welled up out of the collar of his suit. And standing grimly in the opening, an automatic smoking in his right hand, a charged flame pistol in his left, was Gogrol!

I had no weapon; why should one carry arms on harmless Europa? For an instant I stood frozen, appalled, uncomprehending, and in that moment Gogrol glimpsed me. I saw his hand tighten on his automatic, then he shrugged and strode toward me.

"Well," he said with a snarl in his voice, "I had to do it. They went crazy. Anerosis. It struck both of them at once, and they went clean mad. Self-defense, it was."

I DIDN'T believe him, of course. People don't get anerosis in air no rarer than Europa's; one could live his whole life out there without ever suffering from air starvation. But I couldn't argue those points with a panting murderer armed with the most deadly weapon ever devised, and with a girl coming up behind me. So I said nothing at all.

Claire came up; I heard her shocked intake of breath, and her almost inaudible wail, "Stefan!" Then she saw Gogrol holding his guns, and she flared out, "So you did it! I knew they sus-

pected you! But you'll never get away with it, you——"

She broke off under the sudden menace in Gogrol's eyes, and I stepped in front of her as he raised the automatic. For an instant death looked squarely at both of us, then the man shrugged and the evil light in his eyes dimmed.

"A while yet," he muttered. "If Coretti dies——" He backed to the air lock and pulled a helmet from within the *Minos,* an air helmet that we had thought might serve should we ever need to cross the heights about a blind valley.

Then Gogrol advanced toward us, and I felt Claire quiver against my shoulder. But the man only glared at us and spat out a single word. "Back!" he rasped. "Back!"

We backed. Under the menace of that deadly flame pistol he herded us along the narrow valley, eastward to the slope whence angled the ravine that led toward Gunderson's valley. And up the slope, into the dim shadows of the pass itself, so narrow in places that my outstretched hands could have spanned the gap between the walls. A grim, dark, echo-haunted, and forbidding place; I did not wonder that the girl shrank against me. The air was thin to the point of insufficiency, and all three of us were gasping for breath.

There was nothing I could do, for Gogrol's weapons bore too steadily on Claire Avery. So I slipped my arm about her to hearten her and inched warily along that shadowy canyon, until at last it widened, and a thousand feet below stretched a valley—Gunderson's valley, I knew at once. Far away was the slope where the *Hera* had rested, and down in the lower end was the heart-shaped pool of brine.

Gogrol had slipped on the helmet, leaving the visor open, and his flat features peered out at us like a gargoyle's. On he drove us, and down into the valley. But as he passed the mouth of the ravine, which by now was no more than a narrow gorge between colossal escarpments that loomed heavenward like the battlements of Atlantis, he stooped momentarily into the shadows, and when he rose again I fancied that a small sound like the singing of a teakettle followed us down the slope. It meant nothing to me then.

He waved the automatic. "Faster!" he ordered threateningly. We were down in the talus, now, and we scrambled doggedly among the rocks and fallen débris. On he drove us, until we stumbled among the boulders around the central pond. Then, suddenly, he halted.

"If you follow," he said with a cold intensity, "I shoot!" He strode away, not toward the pass, but toward the ridge itself, back along the slopes that lay nearest the *Minos,* hidden from view in the other valley. Of course, Gogrol could cross those airless heights, secure in his helmet, carrying his air supply like the bladder birds.

He seemed to seek the shelter of an ascending ridge. As the jutting rock concealed him, I leaped to a boulder.

"Come on!" I said. "Perhaps we can beat him through the pass to the ship!"

"No!" screamed Claire, so frantically that I halted. "My Lord, no! Didn't you see the blaster he left?"

The singing teakettle noise! I had barely time to throw myself beside the girl crouching behind a rock when the atomic bomb let go.

I SUPPOSE everybody has seen, either by eye or television, the effect of atomic explosions. All of us, by one means or the other, have watched old buildings demolished, road grades or canals blasted, and those over forty may even remember the havoc-spreading bombs of the Pacific War. But none of you could have seen anything like this, for this explosion had a low air pressure and a gravitation only one

eighth normal as the sole checks to its fury.

It seemed to me that the whole mountain lifted. Vast masses of crumbling rock hurtled toward the black sky. Bits of stone, whistling like bullets and incandescent like meteors, shot past us, and the very ground we clung to heaved like the deck of a rolling rocket.

When the wild turmoil had subsided, when the débris no longer sang about us, when the upheaved masses had either fallen again or had spun beyond Europa's gravitation to crash on indifferent Jupiter, the pass had vanished. Mountain and vacuum hemmed us into a prison.

Both of us were slightly stunned by the concussion, although the thin atmosphere transmitted a strangely high-pitched sound instead of the resounding *b-o-o-m* one would have heard on the Earth. When my head stopped ringing, I looked around for Gogrol, and saw him at last seven or eight hundred feet up the slope of the mountain. Anger surged in me; I seized a stone from the margin of the pool, and flung it viciously at him. One can throw amazing distances on small worlds like Europa; I watched the missile raise dust at his very feet.

He turned; very deliberately he raised the automatic, and stone splinters from the boulder beside me stung my face. I dragged Claire down behind the shelter, knowing beyond doubt that he had meant that bullet to kill. In silence we watched him climb until he was but a tiny black speck, nearing the crest.

He approached a bladder bird crawling its slow way along the airless heights. Up there the creatures were slow as snails, for their flight membranes were useless in the near vacuum. But they had normally no enemies on the peaks.

I saw Gogrol change his course purposely to intercept the thing. Intentionally, maliciously, he kicked a hole in the inflated bladder, collapsing it like a child's balloon. He stood watching while the miserable creature flopped in the agonies of suffocation, then moved methodically on. It was the coldest exhibition of wanton cruelty I had ever witnessed.

Claire shuddered; still in silence we watched the man's leisurely progress along the ridge. There was something in his attitude that suggested searching, seeking, hunting. Suddenly he quickened his pace, and then halted abruptly, stooping over what looked to me like a waist-high heap of stones, or perhaps merely a hummock on the ridge.

But he was burrowing in it, digging, flinging stones and dirt aside. And at last he stood up; if he held anything, distance hid it, but he seemed to wave some small object at us in derisive triumph. Then he moved over the crest of the hills and disappeared.

V.

CLAIRE sighed despondently; she seemed very little like the proud and rather arrogant Golden Flash. "That settles it," she murmured disconsolately. "He's got it, and he's got us trapped so we're quite helpless."

"Got what?" I asked. "What was he digging for up there?"

Her blue eyes widened in amazement. "Don't you know?"

"I certainly don't. I seem to know less about this damn trip than anybody else on it."

She gazed steadily at me. "I knew Stefan was wrong," she said softly. "I don't care what you were when you wrecked the *Hera*, Jack Sands; on this trip you've been decent and brave and a gentleman."

"Thanks," I said dryly, but I was a little touched for all that, because, after all, the Golden Flash was a very beau-

tiful girl. "Then suppose you let me in on a few of the secrets. For instance, what was Coretti wrong about? And what did Gogrol dig for?"

"Gogrol," she said, watching me, "was digging in Gunderson's cairn."

I looked blank. "Gunderson's what? This is new to me."

She was silent for a moment. "Jack Sands," she said at last, "I don't care what Stefan or the government or anybody thinks of you. I think you're honest, and I think you've had an injustice done you somehow, and I don't believe you were to blame in the *Hera* crash. And I'm going to tell you all I know about this matter. But first, do you know the object of Gunderson's expedition to Europa?"

"I never knew it. I'm a pilot; I took no interest in their scientific gibberish."

She nodded. "Well, you know how a rocket motor works, of course. How they use a minute amount of uranium or radium as catalyst to release the energy in the fuel. Uranium has low activity; it will set off only metals like the alkalis, and ships using uranium motors burn salt. And radium, being more active, will set off the metals from iron to copper, so ships using a radium initiator usually burn one of the commoner iron or copper ores."

"I know all that," I grunted. "And the heavier the metal, the greater the power from its disintegration."

"Exactly." She paused a moment. "Well, Gunderson wanted to use still heavier elements. That required a source of rays more penetrating than those from radium, and he knew of only one available source—Element 91, protactinium. And it happens that the richest deposits of protactinium so far discovered are those in the rocks of Europa, so to Europa he came for his experiments."

"Well?" I asked. "Where do I fit in this mess?"

"I don't quite know, Jack. Let me finish what I know, which is all Stefan would tell me. Gunderson succeeded, they think; he's supposed to have worked out the formula by which protactinium could be made to set off lead, which would give much more power than any present type of initiator. But if he did succeed, his formula and notes were destroyed when the *Hera* crashed!"

I began to see. "But what—what about that cairn?"

"You really don't know?"

"I'll be doubled damned if I do! If Gunderson built a cairn, it must have been that last day. I had the take-off, so I slept through most of it. But—why, they did have some sort of ceremony!"

"YES. Gunderson mentioned something about it when your ship touched at Junopolis on Io. What the government hopes is that he buried a copy of his formula in that cairn. They do, you know. Well, nobody could possibly know of the location except you and a man named Kratska, who had disappeared.

"So Interplanetary, which is in bad anyway because of some stock transactions, was ordered to back this expedition with you as pilot—or at least, that's what Stefan told me. I guess I was taken along just to give the corporation a little more publicity, and, of course, Stefan was sent to watch you, in hopes you'd give away the location. The formula's immensely valuable, you see."

"Yeah, I see. And how about Gogrol?"

She frowned. "I don't know. Stefan hinted that he had some connection with Harrick of Interplanetary, or perhaps some hold over him. Harrick insisted on his being a member."

"The devil!" I exploded suddenly. "He knew about the cairn! He knew where to look!"

Her eyes grew wide. "Why, he did! He's—could he be the representative of some foreign government? If we could stop him! But he's left us absolutely helpless here. Why didn't he kill us?"

"I can guess that," I said grimly. "He can't fly the *Minos* alone. Henshaw's dead, and if Coretti dies—well, one of us is due for the job of pilot."

A tremor shook her. "I'd rather be dead, too," she murmured, "than to travel with him alone."

"And I'd rather see you so," I agreed glumly. "I wish to heaven you had stayed out of this. You could be home enjoying your money."

"My money!" she flashed. "I haven't any money. Do you think I take these chances for publicity or thrills or admiration?"

I gaped; of course, I'd thought exactly that.

She was literally blazing. "Listen to me, Jack Sands. There's just one reason for the fool things I do—money! There isn't any Avery fortune, and hasn't been since my father died. I've needed money desperately these last two years, to keep the Connecticut place for my mother, because she'd die if she had to leave it. It's been our family home for two hundred years, since 1910, and I won't be the one to lose it!"

It took a moment to adjust myself to what she was saying. "But a racing rocket isn't a poor man's toy," I said feebly. "And surely a girl like you could find——"

"A girl like me!" she cut in bitterly. "Oh, I know I have a good figure and a passable voice, and perhaps I could have found work in a television chorus, but I needed real money. I had my choice of two ways to get it: I could marry it, or I could gamble my neck against it. You see which way I chose. As the Golden Flash, I can get big prices for endorsing breakfast foods and beauty preparations. That's why I gambled in that race; my racing rocket was all I had left to gamble with. And it worked, only"—her voice broke a little—"I wish I could stop gambling. I—I hate it!"

It wasn't only pity I felt for her then. Her confession of poverty had changed things; she was no longer the wealthy, unattainable being I had always imagined the Golden Flash to be. She was simply a forlorn and unhappy girl; one who needed to be loved and comforted. And then I remembered the evening of the eclipse, and Coretti's arms about her. So I gazed for an instant at the sunlight on her hair, and then turned slowly away.

After a while we gathered some liverleaves and cooked them, and I tried to tell Claire that we were certain to be rescued. Neither of us believed it; we knew very well that Gogrol would carry no living companion to Io; whoever helped him run the *Minos* would certainly be dead and cast into space before landing. And we knew that Gogrol's story, whatever it might be, would not be one likely to encourage a rescue party. He'd simply report us all dead somehow or other.

"I don't care," said Claire. "I'm glad I'm with you."

I thought of Coretti and said nothing. We were just sitting in glum silence near the fire when Gogrol came over the hills again.

CLAIRE saw him first and cried out. Despite his helmet, neither of us could mistake his broad, squat figure. But there was nothing we could do except wait, though we did draw closer to the area of wild and tumbled boulders about the central pool.

"What do you suppose——" asked Claire nervously.

"Coretti may have died, or may be too injured to help."

Pain twisted her features. "Yes, or—— Oh, I know, Jack! It's that Gogrol can't plot a course. He can

pilot; he can follow a course already laid out, but he can't plot one—and neither can Stefan!"

Instantly I knew she must be right. Piloting a ship is just a question of following directions, but plotting a course involves the calculus of functions, and that, let me tell you, takes a mathematician. I could do it, and Claire handled a simple route well enough—one had to in rocket racing—but astrogators were not common even among pilots.

You see, the difficulty is that you don't just point the ship at your destination, because that destination is moving; you head for where the planet will be when you arrive. And in this case, assuming Gogrol meant to make for Io, a journey from Europa to that world meant speeding in the direction of the colossal mass of Jupiter, and if a rocket once passed the critical velocity in that direction—good night!

A hundred feet away Gogrol halted. "Listen, you two," he yelled, "I'm offering Miss Avery the chance to join the crew of the *Minos*."

"You're the crew," I retorted. "She's not taking your offer."

Without warning he leveled his revolver and fired, and a shock numbed my left leg. I fell within the shelter of a boulder, thrusting Claire before me, while Gogrol's bellow followed the crash of his shot: "I'll shut your mouth for you!"

There began the weirdest game of hide and seek I've ever played, with Claire and me crawling among the tumbled boulders, listening for Gogrol's shuffling steps, scarcely daring to breathe. Gogrol had all the advantage, and he used it. I couldn't stand upright, and my leg began to hurt so excruciatingly that I was afraid each minute of an involuntary groan forcing its way through my lips. Claire suffered with me; her eyes were agonized blue pools of torment, but she dared not even whisper to me.

Gogrol took to leaping atop the boulders. He glimpsed me, and a second bullet struck that same burning leg. He was deliberately hunting me down, and I saw it was the end.

We had a momentary shelter. Claire whispered to me, "I'm going to him. He'll kill you otherwise, and take me anyway."

"No!" I croaked. "No!"

Gogrol heard, and was coming. Claire said hastily, "He's—bestial. At least I can plot a course that will—kill us!" Then she called, "Gogrol! I'll surrender."

I snatched at her ankle—too late. I went crawling after her as she strode into the open, but her steps were too rapid. I heard her say, "I give up, if you won't—shoot him again."

Gogrol mumbled, and then Claire's voice again, "Yes. I'll plot your course, but how can I cross the peaks?"

"Walk," he said, and laughed.

"I can't breathe up there."

"Walk as far as you can. You won't die while I take you the rest of the way."

There was no reply. When I finally crept into the open, they were a hundred feet up the slope.

Helpless, raging, pain-maddened, I seized a stone and flung it. It struck Gogrol in the back, but it struck with no more force than if I'd tossed it a dozen feet on Earth. He spun in fury, thrust the screaming Claire aside, and sent another bullet at me. I knew it struck me somewhere near my left shoulder, but pain had numbed me.

Claire saw that I still retained some semblance of consciousness. "Good-by!" she called, and added something that I could not hear because of the red waves of pain, but I knew Gogrol laughed at it. Thereafter, for what seemed like a long time, I knew only

that I was crawling doggedly through an inferno of torture.

When the red mist lifted, I was only at the base of the rise. Far above I could see the figures of Clair and Gogrol, and I perceived that though he strode with easy steps, protected by his helmet, the girl was already staggering from breathlessness. While I watched, she stumbled, and then began to struggle frantically and spasmodically to jerk away from him. It wasn't that she meant to break her promise, but merely that the agonies of suffocation drove her to attempt any means of regaining breathable air.

But the struggle was brief. It was less than a minute before she fainted, passed out from air starvation, and Gogrol slung her carelessly under one arm—as I said, she weighed about twelve pounds on Europa—and pressed on. At the very crest he paused and looked back, and in that thin, clear air I could see every detail with telescopic distinctness, even to the shadow he cast across Claire's drooping golden head.

He raised the revolver to his temple waved it at me with a derisive gesture and then flung it far down the mountainside toward me. His meaning was unmistakable; he was advising me to commit suicide. When I reached the revolver, there was a single unused cartridge in the clip; I looked up, tempted to try it on Gogrol himself, but he was gone across the ridge.

VI.

NOW I knew all hope was gone. Perhaps I was dying from that last bullet anyway, but whether I were or not, Claire was lost, and all that remained for me was the madness of solitude, forever imprisoned by empty space in this valley. That or—suicide.

I don't know how many times I thought of that single cartridge, but I know the thought grew very tempting after a few more hours of pain. By that time, for all I knew, the *Minos* might have taken off on its dash to death, for the roar of its blast could not carry over the airless heights, and it would be so high and small by the time I could see it above the hills that I might have missed it.

If only I could cross those hills! I began to realize that more important than my own life was Claire's safety, even if it meant saving her for Coretti. But I couldn't save her; I couldn't even get to her unless I could walk along the hills like a bladder bird.

Like a bladder bird! I was sure that it was only the delirium of fever that suggested that wild thought. Would it work? I answered myself that whether it worked or failed it was better than dying here without ever trying.

I stalked that bladder bird like a cat. Time after time I spent long minutes creeping toward a copse of song-bushes only to have the creature sail blithely over my head and across the valley. But at last I saw the thing crouched for flight above me; I dared not delay longer lest my wounds weaken me too much for the trial of my plan, and I fired. There went my single cartridge.

The bladder bird dropped! But that was only the beginning of my task. Carefully—so very carefully—I removed the creature's bladder, leaving the vent tube intact. Then, through the opening that connects to the bird's single lung, I slipped my head, letting the bloody rim contract about my throat.

I knew that wouldn't be air-tight, so I bound it with strips torn from my clothing, so closely that it all but choked me. Then I took the slimy vent tube in my mouth and began an endless routine. Breathe in through the vent tube, pinch it shut, breathe out into the bladder—over and over and over. But gradually the bladder expanded with filthy, vitiated, stinking, and once-breathed air.

I had it half filled when I saw that I was going to have to start if I were to have a chance of living long enough for a test. Breathing through the vent tube as long as there was air enough, peering dully through the semitransparent walls of the bladder, I started crawling up the hill.

I won't describe that incredible journey. On Earth it would have been utterly impossible; here, since I weighed but eighteen pounds, it was barely within the bounds of possibility. As I ascended, the bladder swelled against the reduced pressure; by the time I had to start breathing the fearful stuff, I could feel it escaping and bubbling through the blood around my neck.

Somehow I made the crest, almost directly above the *Minos*. It was still there, anyway. Gogrol hadn't come this way, and now I saw why. There was a sheer drop here of four hundred feet. Well, that only equaled fifty on Earth, but even fifty—— But I had to try it, because I was dying here on the peaks. I jumped.

I landed with a wrench of pain on my wounded leg, but much more lightly than I had feared. Of course! Jumping down into denser air, the great bladder had acted like a parachute, and, after all, my weight here was but eighteen pounds. I crawled onward, in agony for the moment when I could cast off the stinking, choking bladder.

That moment came. I had crossed the peaks. and before me lay the *Minos*. I crawled on, around to the side where the air lock was. It was open, and a voice bellowed out of it. Gogrol!

"You'll trick me, eh!" he screeched. "You'll lay a course that will crash us! We'll see! We'll see!" There came the unmistakable sound of a blow, and a faint whimper of pain.

Somewhere I found the strength to stand up. Brandishing the empty automatic, I swayed into the air lock, sliding along the walls to the control room.

There was something about the figure that bent in the dusk above a sobbing girl that aroused a flash of recognition. Seeing him thus in a shadowed control room with the sun shields up—I knew what I should have known weeks ago. Gogrol was—Kratska!

"Kratska!" I croaked, and he whirled. Both he and Claire were frozen into utter rigidity by surprise and disbelief. I really think they were both convinced that I was a ghost.

"How—how——" squeaked Gogrol, or rather Kratska.

"I walked across. I'd walk across hell to find you, Kratska." I branished the gun. "Get outside. Get out and get away quick, if you expect to escape the blast. We're leaving you here until police from Io can pick you up—on that *Hera* matter among others." I spoke to the dazed Claire. "Close the air lock after him. We're taking off."

"Jack!" she cried, comprehending at last. "But Stefan's wired to a tree out there. The blast will incinerate him!"

"Then loose him, and for Heaven's sake, quickly!"

But no sooner had she vanished than Kratska took his chance. He saw how weak I was, and he gambled on the one shot he thought remained in the magazine of my weapon. He rushed me.

I think he was mad. He was screaming curses. "Damn you!" he screeched. "You can't beat me! I made you the goat on the *Hera,* and I can do it here."

And I knew he could, too, if he could overcome me before Claire released Coretti. She couldn't handle him, and we'd all be at his mercy. So I fought with all the life I had left, and felt it draining out of me like acid out of a burette. And after a while it was all drained, and darkness filled up the emptiness.

I HEARD curious sounds. Some one was saying, "No, I'll take off first and lay out the course after we reach

escape velocity. Saves time. We've got to get him to Io." And a little later, "Oh, Lord, Stefan! If I roll her now—— Why am I such a rotten pilot?" And then there was the roar of the blast for hours upon hours.

A long time later I realized that I was lying on the chart room table, and Coretti was looking down at me. He said, "How you feel, Jack?" It was the first time he had used my name.

"O. K.," I said, and then memory came back. "Gogrol! He's Kratska!"

"He was," said Coretti. "He's dead."

"Dead!" There went any chance of squaring that *Hera* mess.

"Yep. You killed him, smashed in his head with that automatic before we could pull you off. But he had it coming."

"Yeah, maybe, but the *Hera*——"

"Never mind the *Hera*, Jack. Both Claire and I heard Kratska admit his responsibility. We'll clear you of that, all right." He paused. "And it might make you feel a little more chipper if I tell you that we got the formula, too, and that there's a reward for it that will leave us sitting in the clover field, even split three ways. That is, Claire keeps insisting on three ways; I know I don't deserve a split."

"Three ways is right," I said. "It'll give you and Claire a good send-off."

"Me and Claire?"

"Listen, Coretti. I didn't mean to, but I saw you the evening of the eclipse. Claire didn't look as if she was fighting you."

He smiled. "So you saw that," he said slowly. "Then you listen. A fellow who's asking a girl to marry him is apt to hold the girl a little close. And if she's got any heart, she doesn't push him away. She just says no as gently as possible."

"She says no?"

"She did that time. I'd bet different with you."

"She—she——" Something about the familiar sound of the blast caught my attention. "We're landing!"

"Yeah, on Io. We've been landing for two hours."

"Who took off?"

"Claire did. She took off and kept going. She's been sitting there fifty hours. She thinks you need a doctor, and I don't know a damn thing about running a rocket. She's taken it clear from Europa."

I sat up. "Take me in there," I said grimly. "Don't argue. Take me in there!"

Claire barely raised her eyes when Coretti slid me down beside her. She was all but exhausted, sitting there all those weary hours, and now up against her old terror of landing. "Jack, Jack!" she whispered as if to herself. "I'm glad you're better."

"Honey," I said—her hair did look like honey—"I'm taking half the U-bar. Just let me guide you."

We came down without a roll, and landed like a canary feather. But I hadn't a thing to do with it; I was so weak I couldn't even move the U-bar, but she didn't know that. Confidence was all she needed; she had the makings of a damn good pilot. Yeah; I've proved that. She is a damn good pilot. But all the same, she went to sleep in the middle of our first kiss.

STAR DUST

Last night I sat down and scanned the files of Astounding Stories, from October, 1933, up to date. Over and over I was tempted to stop and read once more the stories which stand out like stars along the spaceways.

"Ancestral Voices," "Colossus," "Rebirth," "Sidewise in Time," "The Legion of Space," "The Skylark of Valeron," "Twilight," "Old Faithful," "Alas, All Thinking"—great stories, every one of them—and so many more—and then something occurred to me and I stopped——

Did you know that Stanley Weinbaum took off on the Last Great Journey through the galaxies in December? That he set his course by the stars I do not doubt. Astounding Stories is proud of his accomplishments in science-fiction. He created a niche for himself that will be hard to fill. And I can think of no greater tribute than to say what I feel—that I think of him as having groomed his space ship and taken off for the nebula he loved to write about—unafraid—an intrepid explorer facing the unknown.

Next month Wellman returns to us, and Eando Binder starts a two-part story. Nat Schachner will be with us again—this time with a thought-variant.

And I have reason to believe that some of the greatest thought-variants yet attempted will be appearing during the next few issues. The program for the year is shaping up. There are treats in store for us if we make it a point to get every issue. It would be a friendly gesture to your friends to introduce them to the most exclusive reading audience in the magazine world. Now, with our smoothly trimmed edges, more than ever before, we have reason to expect our reading circle to expand.

And as we expand in numbers, interest in science-fiction grows. For instance, "Fantasy," the only printed "fan" magazine in science-fiction circles, celebrated its third anniversary recently with its most elaborate issue. And a dozen other papers, representing local groups, have come into being. It is a healthy sign!

Step by step during the last two and a half years, Astounding has set a pace. Step by step we have proceeded to draw the best authors into our group. We have introduced new writers who will be stars in their own right as time passes. We increased the number of pages first. Then we reduced the type size so as to include more words. Then we increased the number of letters in Brass Tacks. Now we give you trimmed edges.

And step by step, the interest in science-fiction has grown. And I want you to help me keep it growing. There is no more interesting or educational reading anywhere.—The Editor.

MAD ROBOT

Has it ever occurred to you that a machine can be complex enough to go insane? This one did!

by Raymond Z. Gallun

WITH the bulk of Saturn grown thrillingly immense in the void ahead, Bar Andrews Warrants still thought of Callisto, the moon of Jupiter from which he had departed two months before.

Beautiful, strange Callisto, whose caverns were the homes of the Crystal Folk! Bar's eyes gleamed reminiscently as his fancy pictured those cathedrallike grottos, alight with a soft, rosy, gold-misted glow, and alive with the elfin tinklings of their inhabitants.

It had been Professor Dunridge who had called those inhabitants the Crystal Folk. The idealistic old savant had studied them. He had learned that they were a siliceous form of life whose vital processes were sustained by energy derived from Norsonium, Element Ninety-seven of the periodic table, whose radioactive ore was present in the soil of Callisto's caverns.

They were huge, fuzzy, multicolored crystals, capable of slow movements and of certain animal reflexes, and of a curiously complex instinct. Intelligence? Maybe. But Dunridge had doubted it. He had admitted that his reference to them as "folk" had been fanciful.

It was queer that Bar Andrews should remember these things now. Clutching the guide levers of his little ether ship, he looked out of the observation port at the cosmic panorama before him. This was a moment of triumph. Saturn was a great, yellow-white globe ahead, blotting out a third of the stars of space. Around it were the scattered pearls of its satellites. The rings arched upward in a star-dust path which, seen at an angle, looked like a tiara on the pate of some huge, unholy goddess.

It was fun to let one's imagination run riot out here in the congealed stillness of the void. It made one man in particular, and in fact all men in general, seem very important. Bar loved glory. He was the first to approach Saturn closer than a hundred million miles. Danger to life was a small price to pay for such a privilege!

And there had been other men who had achieved interplanetary fame. The hot jungles of Venus, and the degenerated civilization of Mars, already knew Earth's sway. The same was true of numerous asteroids, and of several of Jupiter's moons, among them Callisto.

Without any premonitions of approaching calamity, Bar continued to think strange, rambling thoughts. Would mankind's conquests always go on as they had, or would there be a check somewhere? Were some of the conquered peoples really as simple as they seemed? The Crystal Folk, for instance? They lived lives as uncomplicated as those of plants, but in their caverns were relics of a more active past.

There was a great, crystalline globe there, that might have been the hull of a kind of craft. Could they have made

It was a grotesque tableau there beneath the lurid flares of lightning and the foggy colors of Saturn's sky!

it? If so, how? They had no hands or equivalent organs, with which to fashion tools or to use them. Perhaps they had exuded it from their substance, as clams exude the liquid that hardens to form their shells.

It was an outlandish idea, yet it had ramifications—interesting ones. Why should the culture of the Callistans have deteriorated so, if it had once been as great as his fancy pictured it? Well, maybe the Crystal Folk had decided that eternal striving for greater accomplishments was pointless, and had concluded that a simple, Utopian existence was best! Oh, yes, there were answers,

even if they might seem far-fetched to a human being. And it was to be remembered that the Callistans were not human beings. The substance that composed them was not even protoplasm!

Bar Andrews shrugged to dispel the faint tingling sensation that was scrambling along his spine, in spite of the knowledge that his ruminations constituted nothing more than amusing fantasy.

Anyway, he felt sorry for the Crystal Folk. On Callisto they were being destroyed like so much encumbering brushwood. Man was invading their caves, purifying the acid-saturated air, and establishing Norsonium mines, whose precious loot provided the fuel for vessels of the ether.

More practical matters claimed Bar's attention. The needle of a gravitometer on the pipette-webbed wall warned of the necessity for immediate action. It was not his purpose to enter the atmosphere of Saturn on this venture, but to swing around it, meanwhile taking various observations. To approach too close to the great ringed world would be fatal, for he had insufficient fuel to tear away from its gravity.

BAR'S FACE was grim as he thrust his lips close to a speaking tube. "Fire the Number Seven Rocket, Scarecrow!" he ordered curtly.

"Yes, sir!" was the immediate response, given in clicking, metallic tones.

Andrews' eyes softened momentarily. Good old "Scarecrow!" He wasn't even human; he was only an intricate mechanical fabrication, but no devotee to a heathen deity could have been more faithful.

From the stern compartment, where the robot was stationed, came the buzz of an exciter-arc. The sound was muffled in a crescendoing hiss, that grew into an all-enveloping roar. The ship gave a start, like a prodded animal. The pungence of scorched metal invaded the pilot chamber.

It took seconds for Bar Andrews to know that something had gone wrong. Braced in his seat, to avoid being hurled from it by the terrific acceleration, he saw the Saturnian system reel evenly across his field of view. The movement was not what he had expected, for it was toward the planet instead of away from it!

Conscious that his life, and the success of his venture, were at stake, Andrews remained cool. But when he spoke into the communicator tube, his teeth were bared.

"You've made a mistake, Scarecrow," he said quietly. "If this goes on, we'll be thrown right into the atmosphere of Saturn. I told you, the Number Seven Tube——"

"Sir told me—the Number Fourteen Tube," Scarecrow responded.

"Don't argue!" Andrews ordered. "Cut fuel from fourteen. Number Seven! Quick!"

There was a long, ominous pause. Through a side port Bar glimpsed a vast jetted plume of incandescent suicide, spurting from rocket fourteen. It coiled and dimmed like a ghost veil against the hard orbs of space. The gas that composed it was incredibly tenuous, for it represented, in mass, only a few grams of disintegrated Norsonium. But what it lacked in density, it made up in the colossal speed at which it was ejected, thus providing the necessary reaction to propel the vessel.

"Can't stop fourteen," the robot's tones responded, like the judgment of fate.

"Why?" Bar demanded, his voice hushed, and his young face whitening.

"Can't stop fourteen," Scarecrow repeated childishly. "Sir must not stop fourteen."

ANDREWS began to see the truth at last. Robot madness! The trouble was

not with the ship, but with Scarecrow's intricate mechanical brain. Bar had heard of such mishaps before. Once, in a New York apartment, an old-style automat had gone crazy. It had hammered its way down through five floors before it had broken itself. But that was years ago. Scarecrow was brand new, more intricate, more human, more dependable. Andrews had bought him from Professor Dunridge in Callisto. Scarecrow should be—but no; perhaps his complexity would only render his madness more devilishly subtle.

Without another word young Andrews scrambled to his feet and stumbled his way aft through the careening ship. The door of the stern compartment was closed, to confine the noxious gases of its interior, which only an automat could endure unprotected.

Bar groped for a mask in a metal box fastened to the wall. But any plan he may have had, was forestalled. Scarecrow had detected his approach. The waves of a paralyzer gun, more penetrating than X rays, blazed invisibly through the door, and gripped Bar's nerves. His knees wilted beneath him, and he crumpled. A moment later, the metal panel opened, and he was dragged into the rocket room.

Stinging vapors bit into his lungs. During the few seconds before they overcame his consciousness, he had time to gather in only a few hazy impressions. He saw Scarecrow, slender, gleaming, camera-eyed, turn from him to manipulate a set of levers. The pipetted breech of the Number Fourteen Rocket was red and smoking with heat. There was a terrific jolt as several of its companions went into action.

Bar Andrews regained his senses, knowing that in the border-line delirium he had been swearing violently, and that he had been difficult to restrain. He was back in the pilot room now, lying on its floor. Scarecrow stood over him impassively.

Bar tried to collect his scattered wits, in order to gain a clearer understanding of the bizarre situation in which he found himself.

"What—what's wrong?" he stammered. "Where are we going?" His words were almost blotted out in the thunderous growl of the rockets.

"Nothing wrong," the automat said in its usual, flat, mechanical tones. "Destination—Saturn. Sir will guide ship. For me, impossible. Insufficient knowledge."

Weakly, Bar raised himself to a sitting position. Through squinted, bloodshot eyes, he studied the insensate thing that had been his servitor.

"Why are we going to Saturn, Scarecrow?" he demanded, trying to probe out the cause for the automat's weird mental aberration.

"Necessary. We must!"

"That's no reason!"

"Necessary. We must!" the robot repeated stubbornly.

Andrews gave up. He knew that forces beyond his understanding were at work. Sight of that burnished monster, towering dominantly above him, suggested dark secrets of cosmic magnitude, about which human beings knew nothing. Bar's flesh roughened with dread.

He directed his gaze out through the forward observation port. The nose of the ship pointed straight at one edge of Saturn's vast, luminous bulk. If its present path remained unchanged, it would continue on in a parabola that would plunge it into the colossal planet.

Bar could see, both by the fact that Saturn's size had not increased much since he had last looked upon it, and by the reading of the chronometer on his chart table, that he had not been unconscious for more than a few minutes. Still, the damage that had been done during that interval could not be corrected. The rockets had driven the

vessel straight into the teeth of misfortune.

"I won't navigate to Saturn!" Bar announced furiously, some wild idea in his mind that he could combat fate.

"Sir knows everything," Scarecrow responded impassively. "Sir will navigate to Saturn. Insufficient fuel to escape gravity of planet. No guidance —quick destruction. If sir guides ship, life for a few hours more. Sir wants life. Sir wants more knowledge. Sir will navigate to Saturn."

Bar Andrews, looking at the robot's spherical head, wondered if Scarecrow were making some subtle threat. No, he decided; automats, even mad automats, were only machines, contrived to deal in facts. Scarecrow was telling cold, literal truth. But, dangling at his middle, were the only two weapons aboard the ship—the paralyzer gun and a devilish atomicpellet pistol.

Andrews knew that death would come to him, regardless of whether he refused to obey or not. The craft was in the gravitational grip of Saturn now. There was nothing to do but attempt to find a landing place somewhere beneath its huge, gaseous envelope.

"O. K., boss," he said in a voice curiously meek. "Go aft at once, and cut all rocket blasts. Then stand by for orders. We'll have to open the forward braking vents in a minute or so."

And Scarecrow, whose slapstick name misfitted his enigmatic grimness, obeyed as of old, his slender, humanlike body calmly efficient.

THE HOURS that followed were like a lunatic's dream to Bar Andrews. Flame from the prow exhaust nozzles of the rocket tubes at the stern, coiled outside the ports, checking meteoric velocity. Guide levers, by which he could control the angle of those nozzles, grew hot in his grasp. The huge valves clanked. There were pungent, scorching odors—dancing meter needles. Saturn loomed nearer and nearer and more awesome, until it became a great, dazzling sea of clouds. Minute motes of helium and hydrogen, congealed in the awful cold of space, composed them——

Bar began to enjoy himself in a strange, impersonal way. His youth, and adventure and mystery, made it so, in spite of the certain belief that his death was a matter of hours.

The ship settled swiftly in its declining parabola. It came close to the place where the rings approached the immense sphere. They had seemed solid before; now they looked diaphanous and ethereal in the weak rays of the far-off Sun. Stars peeped through them faintly, like illuminator bulbs shining through frosted glass. Meteoric dust was all they were made of, each particle a separate, minute satellite of its mighty primary.

After a while the craft nosed down more steeply. The swirling vapors of Saturn rushed closer. There was a grinding screech as the vessel impacted with the atmosphere. Except for the red glow produced by the meteoric friction of the ship's passage, all external light began to wane. It was as if the space flyer were a stone, dropped into a dark sea.

Down, down, down. How many thousand miles it was, the young Earthian did not know. He could only remember that Saturn was a tenuous world, less dense, as a whole, than water. If it had any solids in its make-up, they would exist only in the form of a small, central core.

The aspect of things changed. There was light once more, foggy and multicolored, as if an aurora of a grandeur utterly beyond anything terrestrial were playing about the plummeting ship. But the murk seemed even denser than before. It veiled everything, like a screen of ground glass.

The stubby airfoils of the ship had found a supporting medium. Like a plane the vessel went into a steep, spiraling glide down through the thickening atmosphere.

Bar peered anxiously below, in quest of some means of locating solid terrain, if such existed. Luck was with him. He saw a flare of red flame, too blurred to be positively identified. But the steady ruddiness of it suggested a stationary landmark—an active volcano, perhaps.

His hands clutched a switch. A slight movement shot a sounding projectile from a point on the undersurface of his craft. It darted down, and in a few seconds burst into a clouded patch of incandescence. That meant that it had struck something firm enough to discharge its percussion cap.

Watching his instruments closely, and barking orders to the mad Scarecrow in the stern compartment, he let the vessel spiral down on its airfoils, retarded a little by the forward exhaust nozzles of the rockets.

The blur of steam thinned below, so that rocky ground was revealed in the auroral light, and the incandescence of the still-flaming projectile. The rockets were silent, and Bar could hear the moaning of a Gargantuan wind, even through the stout hull of his ship. Lightning flashed, and gusts of rain struck fiercely at the windows. Andrews dipped his bow slightly. The craft swooped, struck with a booming crash, slid a few rods on its runners, and stopped motionless. Journey's end.

BAR LOOKED ABOUT wonderingly, his ears ringing. Yes, journey's end. A new planet, hitherto untouched by man—a world from which there was no escape—and, sooner or later, death. All the glory of achievement, which he had hoped for, was gone. Bar shook his head, as if to jar the facts into a pattern that would make them seem more real.

No, not journey's end yet, for there was the disordered robot and its bizarre motives to consider. There was a skein of mystery still to be unwound.

Bar detected clinking footfalls behind him. His scalp muscles were tingling unpleasantly, as he stumbled erect and turned, on leaden limbs.

"Space suits, sir," Scarecrow announced mildly.

"What are we going to do?" Andrews questioned.

"Purpose unknown," the automat replied cryptically.

Bar wondered if he should stake all now in a wild break for freedom. Sight of the two pistollike contrivances at Scarecrow's middle deterred him. The paralyzer gun was plenty to checkmate any false move he might make, even though the robot would hardly use the atomicpellet pistol here. No, Bar decided, his chances now were nil. Perhaps later. And if not, there was no difference. He was doomed, no matter what he did.

"So be it, Scarecrow," he said, holding his features impassive; for he was half afraid that the weird mechanical mind of the automat had somehow gained abnormal wisdom through its derangement, and could read his face.

Bar donned space gear, and was surprised to note that the robot did the same. Being a machine, Scarecrow had no ordinary use for such attire; but perhaps conditions here in the compressed atmosphere, doubtless impregnated with corrosive volcanic vapors, warranted such precautions.

"Come," the automat ordered, through the still-open vision plate of its helmet.

Scarecrow led the way back to the stern compartment. His long arm pointed to a pair of supply chests supported in racks against the curve of the hull. They gleamed dully in the rays of the illuminators.

He seized one, and hoisted it easily to his shoulders, indicating that the man was to do the same with the other.

Bar complied wonderingly. The chests should contain nothing but concentrated rations, sealed hermetically, but they were heavier than such contents would make them. The robot must have been tampering since before the ship had left Callisto.

Scarecrow's free arm moved again, pointing to the air lock that protected the shell of the vessel.

Andrews turned the wheels that worked the inner and outer valves. He and his weird companion passed through. Bar's were the first human feet to touch the soil of Saturn. It was thick, ashy muck, into which he sank half to his knees.

BUT the soil itself was of small interest in competition with all the other grotesque impressions that were beating into his senses. A terrific wind tore at his stumbling body, and hot rain beat down in torrential gusts. The air, close to the warm ground, and cleansed by the tumbling water, was fairly clear; but close above was a scudding tumult of translucent fog. Through it shone light—a soft, wavering, rippling light, of all the gorgeous shades of the rainbow.

The sky was full of great, shifting patches of color, blurred until they lost almost all semblance of outline. Perhaps they represented an auroral phenomenon similar to that of Earth, though, in this denser air, not identical with it. Or maybe it was a gaseous fluorescence, excited by the presence of radioactive substances in the soil. Bar's pulse quickened a bit at this last thought.

Lightning there was, too—great, blurred flares of it from far above the wind-torn streamers of the fog. And thunder—Gargantuan hammerings, for the air was dense under great pressure, and its electrical possibilities were magnified many times by the enormous extent of the Saturnian atmosphere.

Bar Andrews, struggling under his heavy burden, fighting wind, muck, and driving rain, still noticed, with the skill of a trained scientific observer, all these details of his novel environment.

Scarecrow pointed forward, indicating the direction in which they were to go. Watchfully he kept the man ahead of him. A jagged rock loomed before them out of the veil of rain. Now the deep mud that incased his feet quivered in the grip of a seismic tremblor. What must have been a volcanic vent flamed hazily in the distance. Perhaps it was the same one which he had glimpsed before the ether ship had landed. But there would probably be others, many others. This was a primeval, azoic world, still devoid, not only of native intelligence, but of life.

Bar felt the terrific pressure of the air thrusting at the seams of his armor. He saw the bright metal parts of it tarnish visibly in the corrosive volcanic gases around him. His face was strained and hard behind the vision plate of his helmet.

Scarecrow had halted at the edge of a broad, flat area. Twisted, black rocks loomed around. Bar looked at them wonderingly, his mind wavering between hope and dread.

THE AUTOMAT eased its burden to the soft ground, and unfastened the lid. In the next instant Bar saw what the chest contained: gleaming gems! No, not gems—countless small crystals—the seed, the eggs, the spawn, of the Crystal Folk! And Scarecrow stood over them like some guardian angel out of the realm of darkness.

Now he picked up a handful and scattered it as one would scatter seed. Another handful, a third—— Weird fires of awakening life throbbed and cascaded inside the crystals, as they imbedded themselves in the volcanic mud.

Young Andrews felt oddly lost at sight of this curious performance. What did it mean? A mad robot was frequently an enigma to every one except the experts who designed and assembled those intricate mechanisms. Still, why, even then, should Scarecrow's insanity take such an odd form?

Bar's first thought was of those echoes of an unknown past on Callisto. That hull-like globe of glassy material—what did it really mean? Had his idle fancy misinterpreted it? He had thought so before, and viewing the circumstances as they were now, practically, he still thought so.

He believed what Professor Dunridge had said. The Crystal Folk were merely simple forms of life, bizarre and unterrestrial in metabolic function, but probably not intelligent. They had no science, no knowledge, no thought. They lived their Utopian existences, needing none of these things; for, as matters had been, life was easy for them. Certainly they could not influence the actions of a robot!

Yet Bar continued to wonder. Had the lives of the Crystal Folk always been easy? Perhaps not. Perhaps they had used their ingenuity to make it easy, and then had laid aside their no longer useful abilities. Maybe now a fresh need, in the form of threatened extinction, had revived their old-time sciences.

Sciences? How could creatures who did not possess hands have sciences? How could they build instruments and make experiments? To suppose that they could do so seemed rather ridiculous; yet Bar knew that it was perhaps unjust always to judge by the yardstick of human achievement.

The Crystal Folk were different, utterly different, from men. Their methods of attacking a problem might be so at variance with those of men as to be beyond human conception. There were things which terrestrials could not grasp—the end and the beginning of time and space, for instance—certain phases of metaphysics. Telepathy—bah! How could any form of life, crystalline or otherwise, control a robot by means of telepathy, unless the robot was designed to receive such control?

Bar's thoughts were dragged back to the facts. Here was a mechanism, deranged for some reason. He was in its power; and he had noticed, a few moments ago, what he hoped was a chance for freedom, for continued existence, and for the fame and glory which his young spirit craved more than life itself.

The black rocks looming like Titans through the streaking rain seemed the same as the black rocks of the caves of Callisto. Yes, in many ways Saturn was quite like the regions of the Jovian moon's heart—the corrosive air, the excessive moisture.

Bar's purpose became grimly fixed. Every muscle tense, he waited for the desired opportunity. He knew there was grave danger in Scarecrow's atomic-pellet pistol. One shot from it could blow a hill to fragments.

The automat was careful to remain facing him, but young Andrews was just as crafty. He made as if to set down the chest he carried, but, instead, swung it swiftly and threw it toward Scarecrow's knees. It was a grotesque tableau there beneath the lurid flares of lightning and the shifting, foggy colors of Saturn's sky.

The missile struck fairly. The robot toppled. Bar did not wait to see the ultimate outcome of his act, but leaped floundering through the muck toward the place where the ether ship was concealed behind the curtaining holocaust of rain.

Perhaps thirty seconds passed before he knew that Scarecrow, mad, glittering creation of man's genius, was again in action. An atomicpellet burst far to

his right. The concussion of it nearly hurled him to his knees.

Panting, reeling, sweating, he struggled on. The long, low hull of the ether ship came into view, unreal in the shifting light.

He reached it, worked the air lock and entered, just as another pellet burst, not a hundred yards distant, showering the craft with tons of pulverized stone and mud.

Bar knew that there was but one chance, and he took it. Rushing to the stern compartment, he opened up three of the rockets full blast. Their incandescent jets roared magnificently. Unguided, the ship slipped on its runners, and its stubby airfoils lifted it planelike into the air. Wavering and wabbling, it hurtled in a direction which Bar judged from his instruments to be east.

He cut the rockets and hurried to the pilot room. He swung the nose down a trifle. A row of hills appeared through the murk. Passing above them, the craft slanted toward a narrow valley. Bar landed clumsily. He had used almost all of the remaining Norsonium fuel, but he was safe from Scarecrow, for he had moved at least thirty miles.

WORN OUT, he slept for what must have been several hours. Then he redonned his now corroded space suit and went out again into the Saturnian tempest. There was work to do. As he had hoped, the black rock was plentiful in his new location, as no doubt it was over the entire surface of Saturn's core. He collected some samples of it and made tests. His guess had been right. The stuff was the richest Norsonium ore he had ever seen.

"With a little luck, things can come out perfectly now," he muttered.

Days of utter, fagging slavery followed, as he constructed a refining apparatus from his scanty supplies, and proceeded to work it. Worn, weak, and haggard, and at times keyed almost to the point of insanity, Bar at last finished the task he had set for himself. He had a dozen small ingots of the precious Norsonium—enough for the return trip.

The return trip? There was but one chance in a hundred that he could make it without assistance. But he had thought of that. By now Scarecrow's power supply would have run down, making him harmless. If he could be found——

Again Bar took the ship into the air, guiding it westward to the place where he had first landed. The level expanse was an awesome spectacle now. It was covered by a crystal forest, glowing with a gorgeous, multihued phosphorescence of its own—crowding, angular stalagmites of beautiful, living material. The Crystal Folk! Bar imagined that he could hear the chorus of their tinklings even through his space helmet, and in spite of the hiss of the eternal rain and the roar of thunder.

He tramped through the surrounding muck to get closer to the thrilling sight. Hatred was in his heart—consciously, unreasoned hatred for those beautiful, alien colonists from another sphere. They were involved in his misfortunes, and he meant to destroy them.

"A few blasts from the rockets will be enough to wipe them out," he whispered between clenched teeth.

But now he had to find Scarecrow if he could. To do so might take a long time.

How many hours were consumed in the quest, he did not trouble to notice. It didn't really matter. He found the robot at last, motionless, prone, and plastered with mud, but still intact, at the edge of the spreading Callistan colony.

Using up what seemed his last strength, he dragged Scarecrow back to the ship. There he wiped the mud from the senseless thing, and removed its

corroded and battered space armor. It moved a little now, for its energy had not quite been expended. Its voice diaphragm vibrated feebly.

"Sir—no man must come to Saturn —again. No man should know—— Planet for Crystal Folk—— No——" The faint, level tones died away, leaving Bar with a sensation of having conversed with a person long dead.

HE HAD TO repair the robot some way, so that it would again be useful. He lifted its massive headpiece, and unscrewed the platinum cranium that contained Scarecrow's marvelous synthetic intellect. There must be some obstruction that had caused the trouble.

He saw it at once. And for all he knew, it might have done the damage accidentally, without intended purpose. He might never know the truth. But with a tight feeling in his throat, and a puckering sensation along his spine, he began to think about things of which he could have no real understanding—of alien sciences, different from the experimental blunderings of man in his eternal urge to master matter, and of a queer, amorphous shell in the caves of Callisto.

Had the Crystal Folk known what Saturn was like, and that it was a suitable environment for them? If that was true, how could they have learned? Had they visited this planet before it was cool enough to receive them, but when its future condition was already evident?

Most likely this was a crude guess. Human beings really knew very little. As far as he could tell, his ruminations might be just a fantastic joke which his imagination had played upon him. Yet when he looked through a port of the ship, and saw those eldritchly glowing presences, he felt curiously as though a grotesque and omnipotent deity were close at hand.

There were little, frosty crystals incrusting the minutely packed wires that formed the cortex of Scarecrow's brain. They glittered and pulsated with a living fire of changing colors, suggesting intelligence. Had they influenced the automat's actions, by a means other than that of a simple obstruction? There was no way of telling. Bar only knew that they were alive, and that they were of the same substance as the forms of the Crystal Folk. Some accident at Professor Dunridge's laboratory, where the robot had been, had caused their presence. Or had it been an acident? That, too, would remain a dark mystery.

Suddenly, though, Bar Andrews saw, or thought he saw, the glory of it all. Something came into his mind that dominated even his own desire to achieve fame as an interplanetary explorer.

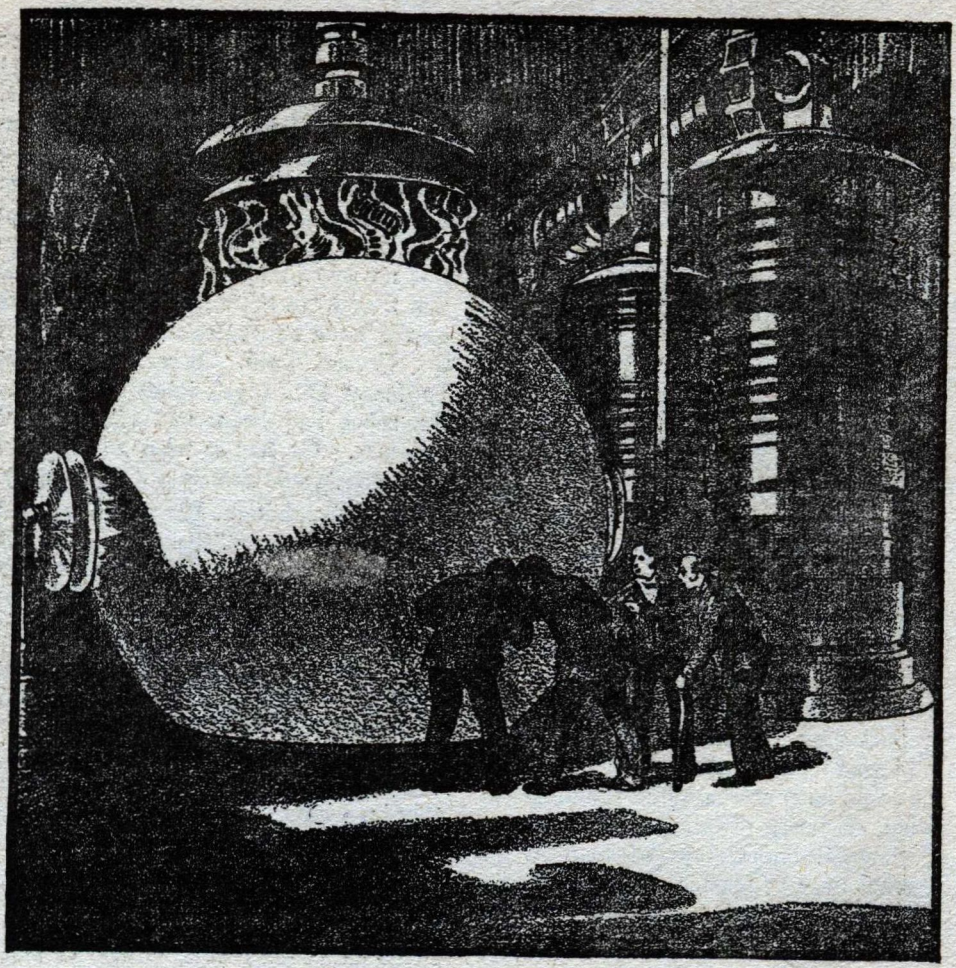
"If they fought to live, they have a right to live," he muttered. "I'll not destroy them. I'll not tell any one about Saturn and the Norsonium here. Let somebody else find out. It'll probably be a long time, and by then maybe the Crystal Folk——"

He left the sentence unfinished. Carefully he scraped the crystals from Scarecrow's brain, afterward applying oil, which he knew from Professor Dunridge's experiments would prevent a regrowth. The black, pitchy substance in which the wires of the automat's thought machine were packed contained a Norsonium salt, and had been slightly pitted; but no serious damage had been done. Afterward Bar recharged the energy cells of the robot.

"Starting back to Callisto, Scarecrow," he said presently. "Go to your post."

"Yes, sir!" the robot replied. He was his faithful self once more.

In a few minutes the ether ship streaked up through Saturn's atmosphere, and reached the cold, airless region of the stars.



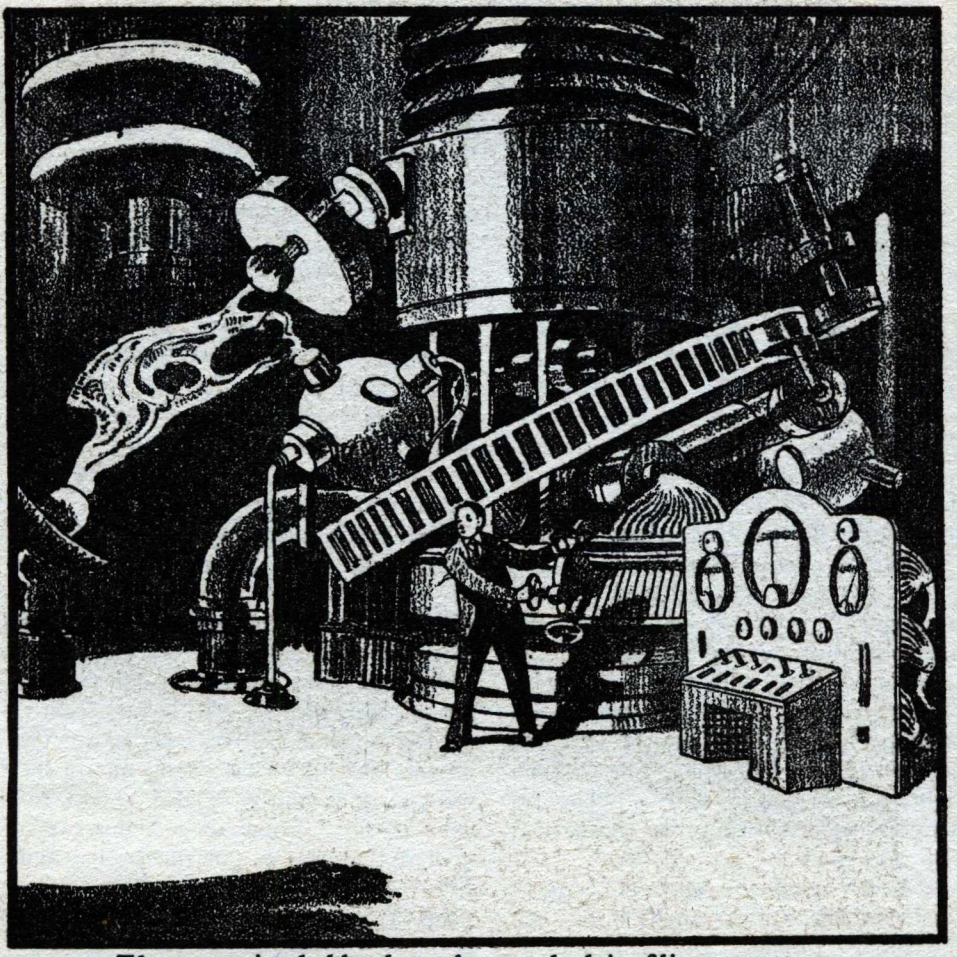
ENTROPY

by Nat Schachner

IT WAS a small but select audience that gathered in Jerry Sloan's laboratory that late June afternoon. They filed in with murmured words of greeting and swift, appraising looks at the young man who had maintained with unseemly positiveness that all their lives of laborious research had been along radically erroneous lines.

He stood up well under their cold scrutiny, however. His keen, alert face showed no signs of his inward perturbation; his gray eyes twinkled gravely at the veiled hostility with which these world-famous physicists shook his hand.

"Whew!" Jerry whispered to the girl who stood a little to one side and just a trifle to the rear, as became a laboratory assistant in the presence of her chief and betters. "Did you see the glare with which old Marlin favored me?"



Then, unmistakably, hoar frost caked in filigree patterns, exuded steamy vapors into the June atmosphere!

A gripping science novel which concerns the timelessness of force

"You can't blame him, can you?" she retorted. "He's just solidified liquid helium, and proved by intricate mathematical formulas that he has approached within several thousandths of a degree of absolute zero. He has also announced that it is impossible to achieve lower temperatures. Then you come along and tell him he's all wrong. That it not only *is* possible, but that you can do it. Furthermore, you add insult to injury by questioning the whole expansion-contraction, ammonia-liquid oxygen cycle as the proper method for getting extremely low temperatures. After all, Marlin and the others are only human."

Kay Ballard was an extremely pretty girl, thereby disproving once and for all the ridiculous old maxim that brains and beauty do not mix. Behind her impish smile and warm, dancing eyes

was a cool, steady mind which by native brilliance and adequate training had proved of invaluable assistance to Jerry Sloan. Not that he didn't appreciate also the impish smile aforesaid, the dancing eyes and the peach blow of smooth-textured skin. Quite the contrary. As a matter of fact—but that is neither here nor there for the moment.

"I suppose not," Jerry admitted. Little creases of worry had suddenly appeared on his forehead, and a harassed look on his face. The last of the invited guests had entered the laboratory, and they were alone in the anteroom. "That's what will make it all the worse if the experiment fizzles. I should have waited another month, made all my preliminary tests first."

"It can't fail," Kay assured him encouragingly. "We've gone over the mathematics of it time and again. It's air-tight." Then, with fine feminine inconsecutiveness, she burst out indignantly, "It's all the fault of that old buzzard, Edna Wiggins. She had no right to force you on with a public announcement just because the endowment year was up."

"She's paying the expenses," Jerry reminded her softly, "and she can call the tune. Besides, Marlin has made her jittery about me. Maybe I'm only a four-flusher."

Kay shook her brown bob defiantly. "A lot she knows about science," she declared. "It's the publicity she's after. Mrs. Wiggins, widow of the late beer baron, the eminent bootlegger, patroness and endower of the arts and sciences. She's afraid now she's backed the wrong horse. The old buzzard!"

"Sssh!" Jerry warned. "Here she comes now." He raised his voice. "Good afternoon, Mrs. Wiggins. We were waiting for you."

A HIGHLY uniformed chauffeur had preceded her, stood with heels clicked and hands stiffly at attention. She waddled in, fat, indeterminate of age, dressed lavishly and expensively, yet in extremely bad taste. Kay's unflattering characterization was apt, Jerry thought, as he forced cordiality into his voice. In spite of the gross breadth of her body, her face was startlingly hollow and leathery, with saclike pouches hanging from her scrawny neck and a fierce, predatory nose overshadowing all her features.

"Good!" Her thinnish head was like a pendulum bobbing on her enormous bulk; her voice was hoarse and mannish. "That means I won't be wasting my time. I've an appointment with my beautician at six sharp."

Her beady, glittering eye passed disapprovingly over the trim youthfulness of Kay—she had argued vehemently with Jerry on the question of young lady lab assistants, but on that point Jerry had been adamant—and pierced her unhappy protégé with hostile regard.

"I've spent a hell of a lot of money on this idea of yours, young man," she went on inelegantly, "and I expect results to-day. Show those fellows you invited that you've got the goods, and I'll stake you to a cool million. The Edna Wiggins Foundation, hey? But if you can't——"

"I wanna go to the movies. I don't wanna stay in this stupid old place." The little boy, about eight, whom she had towed in, half hidden behind her billowing form, darted from behind, beat at her with small, angry fists. His sullen face was distorted with anger.

"There, there, mama's precious," his mother cooed. "Mr. Sloan's going to show you something just as nice as the movies."

But mama's precious kept on howling. "I don't like him and his silly experiments. I wanna see a movie. That's fun."

Jerry and Kay exchanged glances. The young physicist shrugged. Under his breath he swore. If ever there was

a spoiled brat whose neck he'd like to wring, it was young Egbert Wiggins'. His doting mother dragged him everywhere, and several times there had been near catastrophes in the laboratory because of his darling little ways.

For the moment Jerry was tempted to throw the whole thing up, tell the great Edna Wiggins a few plain, unvarnished truths, but that would mean the end of his work, the end of all his scientific dreams. So he ground his teeth, put on his best smile, and ushered his benefactress and her still-squalling brat into the main laboratory where the assembled physicists were inspecting the complicated apparatus with intense, albeit somewhat skeptical interest.

Kay brought up the rear, shaking her shapely fist with a certain vicious intensity at the unsuspecting backs of mother and son.

The apparatus was well worth close attention. In the very center of the great room, poised in a cuplike depression within the floor, was a hollow crystal ball of some fifteen feet in diameter. Its transparent substance held a bluish tinge. Within, slightly magnified and irradiated by the distorting medium of the crystal, were various articles: An iron bar; a chair of carved wood; a small glass tank filled with water; a loaf of bread; a smoked ham, suspended by cord from a hook embedded in the crystal wall; a cage with a tiny white mouse; another with a frightened, fluttering canary.

Thrusting with somber solidity at the sphere from either side were two huge magnets, composed of the new nickel-chrome steel that possesses remarkable magnetic powers. Coils of infinitely fine strands of copper wire wound around their bar lengths, and connected by thick cables with the panel switchboard on the farther wall.

Around the sphere, hemming it in at equidistances of five feet each, were what seemed to be gigantic parabolic reflectors, suspended from the ceiling or supported by floor stands with flexible jointed stems. Even underneath, through the transparency of the sphere where it poised in the hollow, could be seen a reflector pointing upward from the cellar.

"We're ready to begin," Jerry declared, taking his position near the switch panel.

The assembled audience stirred, leaned forward. Every man was a famous scientist; most of them were specialists in low temperatures. Except for Marlin, whose published article Sloan had contradicted, the rest were open to conviction.

Mrs. Wiggins had waddled to a seat in the front row, somewhat annoyed that these men of science had not done more than utter perfunctory words of greeting at her entrance. She compressed her fat lips, glared belligerently. She had been a fool to mess around with cold-blooded brutes like these, who didn't appreciate her hard-earned money or the graciousness with which she lavished it on them. Now if they had been artists and poets——

The boy, Egbert, wandered unnoticed in the rear of the laboratory, touching strange machines with possessive fingers.

"THIS APPARATUS," said Jerry, "represents an entirely different method of solving the problem of extremely low temperatures; yes, of absolute zero itself. I grant you that the expansion and contraction method and the employment of liquid oxygen has been remarkably successful; so successful in fact that my good friend, Professor Marlin, has attained the astounding low of only a few thousandths of a degree above the absolute in solidifying the inert gas, helium."

Marlin's hatchet face, hitherto flint-like in its unreceptiveness, relaxed slowly. A faint smile of gratification

flickered over his countenance. Jerry grinned to himself and went on:

"But, by the very nature of the process, as Professor Marlin has truly indicated, it is impossible to go any farther. Yet it is in that small few thousandths of a degree that science is tremendously interested. For solid helium, just like liquid oxygen, exhibits all the normal, usual properties of matter."

"And why shouldn't it?" some one asked.

"Because of the very nature of heat and cold," Jerry retorted. "Theoretically cold is merely the absence of heat. And heat is merely a form of energy; the energy of matter in motion. Increase the speed of molecular vibrations within any material body, and you increase the heat of that body. Decrease their speed, and by the same token their energy emanations are lessened, and the body becomes 'cold.' Theoretically again, the absolute zero is achieved when the molecules cease all vibration, when they remain quiescent, possessing potential rather than kinetic energy."

"Elementary, young man!" Marlin snorted. "We all know that. We also know it is impossible to reach this absolute."

His compeers nodded. Mrs. Wiggins simply glowered. She didn't quite understand all this talk, but she sensed that the assembled great men did not think much of her protégé—as she described Jerry Sloan to friends and reporters. Her jaw set ominously. A solid hundred thousand bucks wasted, and instead of respectful publicity for herself, the result might prove a boomerang. She caught Kay's eye and glowered indignantly at the girl. How could anything turn out properly with a hussy like that on the job?

Kay glowered back with interest. "Old buzzard!" she mouthed, half audibly. The epithet was cleansing for her soul. She knew, with sudden fierce fear, that Jerry's life work depended on the next few minutes.

But Jerry Sloan went on easily, outwardly unperturbed. "By the old methods, Professor Marlin, you are, of course, right," he pointed out. "I've attacked the problem from its logical angle. Absence of molecular motion means absence of heat. Therefore, the thing to do is to stop the molecules in their paths, bring them to a halt. I've done that!"

NOW he had his sensation. The scientists half rose from their chairs, expostulating, arguing. "Impossible! Incredible!" rose from all sides.

"Not at all, gentlemen," Jerry said quietly. "Look at this apparatus of mine. The crystal sphere is made of tourmaline. Now tourmaline possesses a very peculiar property. It can polarize light; that is, transmit light waves which vibrate only along a particular plane. That means, of course, that the tourmaline molecules lie along parallel axes and vibrate in definite planes. Those supermagnets will force them into the positions I require."

Jerry pointed up at the reflectors. "Those are not reflectors, of course. They are the focuses of very powerful streams of impulses, of extremely minute wave lengths and alternating with a rapidity that I have been able to synchronize exactly with the period of vibration of the tourmaline molecules. Their polarization, naturally, simplifies the problem. Their movements are not haphazard as in ordinary bodies, and can be accurately determined."

"But I still don't see what you're driving at," Marlin exploded.

"I haven't finished," Jerry said patiently. "I time my impulses to lock in with the vibrational periods of the tourmaline. Trough of impulse against recession of molecule; crest of wave against progression. In other words, I am *damping* the vibrations, providing

push-pull resistance, interposing perfect interference. The result is obvious. The molecules are slowed up; their kinetic energy, instead of being dissipated, as heat, is locked up within their bosoms as positional energy; in other words, potential static energy. When they come to an absolute halt, we then have absolute zero."

Professor Marlin permitted himself a bleak smile as he looked around the circle of his confreres.

"The theory of what Mr. Sloan is trying to do is simple enough, my friends. But"—he paused impressively to allow that to sink in—"putting it into practice is quite another matter. Ha! ha!"

Kay colored furiously. "The old fool!" she gritted between her pretty little teeth. "What does he know—— Jerry, show him; show them all!"

But the others had not joined the booming mockery. Perhaps this young fellow had something. So they just sat and waited.

"In another minute you will see the practice also," he told Marlin evenly. "All right, Miss Ballard."

The girl moved to the magnets, threw a switch. Nothing happened, yet every one knew that tremendous magnetic stresses were exercising polar attractions on the crystals.

"Why is that queer array of objects inside the globe?" queried Dakin, authority on gas pressures.

"Simply to get the effects of low temperatures on as wide a variety of materials as possible," Jerry explained. "Now I'm going to turn on the juice."

He moved a lever slightly over a rheostat arrangement. A soft, blue light glowed in gigantic, concentric tubes; the atmosphere was suddenly filled with the pungent odor of ozone as the reflectors glowed with brilliant pin points of flame all over their shiny parabolic surfaces.

Thousands of volts of invisible radiation, oscillating with unimaginable rapidity, hurtled from the reflectors and lashed with incredible force upon the crystal globe and all its contents.

II.

A TENSE silence held them all in thrall as they leaned forward to see what was happening. Even Mrs. Wiggins stared with goggling eyes, vaguely impressed by the blue, lambent fires and the soft roaring of the machines. She forgot her son was there. The others had forgotten him long ago.

Egbert, however, was bored with the display. His sallow face was set in sullen lines. He wanted to go to the movies. He looked surreptitiously around. No one was watching him. His hand groped along an expensive galvanometer, pulled. Wires ripped away. An evil glee invaded his being. This was fun! Softly, he moved along the rear of the laboratory, pushing levers, jerking wires, twisting knobs, ruining thousands of dollars' worth of equipment.

Meanwhile the physicists sat back in their seats, disappointed. Nothing seemed to have happened. "Well?" queried Marlin, faint triumph in his voice.

Jerry smiled. "Look at the bolometer," he suggested.

A thermo-couple, attached inconspicuously within the interior of the globe, registered electrically on an amneter displayed on the panel board. By means of an ingenious contrivance invented by the young physicist, the current flow was converted into direct temperature readings.

The needle pointed boldly to two degrees Centigrade, only a trifle above freezing point. Yet the room temperature was almost twenty-seven degrees.

Marlin snorted skeptically. "Bah! What does that prove? Your high voltage alone, by ionization, by absorp-

tion of heat in expansion, could be responsible for a slight drop in temperature. I've solidified helium and you show me the freezing point of water!"

Jerry grinned engagingly. "I've only started. I'm doing this step by step. Watch!" Again he moved the lever—another notch.

The canary within the tourmaline ball stiffened. The bright-eyed mouse shivered. A vague film breathed like a giant's breath over the clear transparency of the sphere. It spread rapidly, thickened, obscuring everything within. Then, unmistakably, hoar frost caked in filigree patterns, exuded steamy vapors into the June atmosphere of the laboratory. As one man they craned toward the bolometer.

The needle quivered at minus forty degrees Centigrade and was swinging farther to the left with little spasmodic jerks. A long suspiration lifted from the absorbed physicists. This was becoming interesting; decidedly so!

"Show our guests what is happening inside, Miss Ballard," Jerry said placidly.

Kay nodded, picked up a flat knife from a table and diligently scraped at the smooth surface of the icy coating. It flaked away in long, solid crystals until a sufficient area was cleared to give an unobstructed view into the interior.

Both the mouse and the canary were rigid and immovable in their respective cages. The tank of water was a naked cake of ice; the glass container lay in a thousand shards around it, shattered by the expansive thrust of the congealing water.

The bolometer now read minus one hundred and twenty degrees Centigrade.

"Good Lord, man!" Dakin exclaimed suddenly. "You're getting there." Murmurs of assent drifted upward from the others. All except Marlin, who remained stubbornly aloof. But Jerry, outwardly placid in his moment of triumph, was becoming increasingly anxious. His careful, preliminary experiments had been abruptly cut off by Mrs. Wiggins' idiotic insistence on immediate publicity. He had never tried it out beyond the boiling point of liquid air. What would happen after that?

The needle was accelerating on its downward grade. The room was perceptibly chilling. Wallace, the frail-looking chemist, shivered. The hard coating of frost was glassy now, transparent. It was too cold even to cast off steam or vapors. Within the sphere a colorless fluid condensed in a fine drizzle, rolled in a little puddle at the bottom concavity.

Startled eyes swerved to the bolometer. It stood at minus one hundred and ninety-five.

"Yes, gentlemen," Jerry remarked. "That is liquid air you see. The gaseous atmosphere is completely gone. Fortunately the tourmaline is thick enough to resist the outside pressure created by the vacuum within."

Kay stood close to the globe, exultant. It was cold, but she did not mind. The fierce glow of the electron tubes, the sparkle of the reflectors as they hurled their synchronized beats upon the globe, were no stronger or brighter than the happiness in her heart. Jerry had shown them, had stifled their sneers. Already the needle wagged closer and closer to the absolute zero. Minus two hundred and seventy, just below the liquefying point of helium.

NO ONE MOVED; no one stirred. The whine of the machines rose in the frozen air; they sat with lips parted. Minus two hundred and seventy-one! Minus two hundred and seventy-two! Almost two hundred and seventy-three, the absolutely zero of all temperature! The needle slowed, quivered, held fast. That last few thousandths of a degree, magnified on the scale to perceptible di-

mensions, seemed an insurmountable barrier.

Marlin's voice was explosive with relief. "A very excellent machine, Mr. Sloan. A very fine method of achieving low temperatures. But—my thesis is still unshaken. You cannot gain the absolute zero. By the very nature of things you cannot. You have proved my point."

Kay flushed. "But he can, Mr. Marlin," she cried out. "Look! The rheostat lever is over only part of the way. The last notch represents full power, perfect synchronization. Go on, Jerry. Show them!"

Jerry Sloan shook his head. "No," he stated in flat tones. "I haven't tested that phase yet. I don't know what might happen. Within a month I'll know more about it."

"I'll tell you now," chuckled Marlin. "Nothing; absolutely nothing. You've reached the last outpost, the same as I did. Your method is new and ingenious, but it adds nothing to the sum total of knowledge."

Mrs. Wiggins woke with a start at that. This was something she could understand. Professor Marlin was internationally known; he had just said young Sloan's experiment meant nothing.

She rose wrathfully from her seat. Her voice was shrill, excited. "So this is what I spent a hundred thousand on! An experiment that means nothing. You worked on my good nature, on my generosity, with lies, lies! You're a fraud, a cheat!"

Jerry flushed. His hands clenched, unclenched. If only she were a man! "Now listen to me, Mrs. Wiggins," he said miserably. "I didn't promise miracles. I wouldn't be a scientist if I did. But I have discovered something extremely important. It's just that I must have time to make certain that nothing goes haywire; that——"

The bootlegger's widow threw her fat arms wildly toward the others. "Listen to him!" she shrilled. "He wants time. Time! Always he tells me that magic word—*time!* On account of that I spent a hundred thousand; on account of that he wants still more. Show me now!" she clamored. "Or I'll take every bit of stuff out of here. I'll sell it, get what I can to make up my losses."

Her make-up was streaked; her eyes glared. She was beyond reason. Jerry gritted his teeth, started for her. "You wouldn't dare do that," he said very low.

"Oh, I wouldn't!" she exclaimed, appealing to the hushed physicists. "Listen to him. A beggar that I made into a scientist. He robbed me of a hundred thousand and he tells me I don't dare!"

The men shuffled uneasily, embarrassed at this strange woman's stranger outburst. They avoided each other's eyes, avoided especially the tense figure of Jerry Sloan. Even Marlin was abashed. Dakin started to expostulate mildly, found the woman's torrent of words too much for him, and muttered vaguely something about an important appointment he must keep. He really must be going. Really! No one heard him.

Kay gripped the edge of the table with white-knuckled hands. "You old buzzard!" she cried. "You and your filthy money! You ought to thank God you were able to give it to Mr. Sloan for his work. That's the only way you'll ever be remembered."

The frantic woman swung her ponderous form around. "Buzzard!" she wailed. "She called me a buzzard! Me, Edna Wiggins, worth ten million cold plunks. That hussy called me—— Oh! Oh!"

Kay was angry clear through. She had cleansed her soul, made up for all the petty insults, the little tyrannies of a year's politeness. But she was also

frightened. By her outburst she had sealed Jerry's fate irrevocably. That vindictive old woman would never forgive; would put her threat into merciless action. Kay quivered almost against the frozen surface of the sphere. The cold pierced her marrow, chilled her flesh, but she did not feel it.

JERRY, white with rage, left the panel board, strode purposefully in the direction of the woman whose filthy money had financed him. He'd be damned if he'd let her get away with that; and he'd be triple damned if he'd be pushed into an experiment of which he had no present way of telling what the results might be.

Mrs. Wiggins was on the verge of a spectacular faint, and the men, great scientists though they were, knew nothing of feminine tantrums. They were alarmed, crowded around her with fumbling assistance.

So it was that no one saw Egbert Wiggins. That young scion of beer and millions was not interested in his mother's tantrums. He had seen plenty of those before. But he had successfully ripped away all the wires he could find in the rear of the room, had had a swell time pushing buttons, swinging knife edges. Nothing had happened, though. Therein he was vaguely disappointed. Nothing spectacular, nothing that would focus attention on himself. He loved that!

His too-sophisticated eyes swung around the room for new worlds to conquer. They lighted up suddenly. That lever now—how temptingly it rested in its notch. He made his way stealthily toward it, gloating in anticipation.

Jerry, grim and hard of jaw, was pushing his way through the clustered scientists, toward the shrieking woman in their midst. Kay, aghast at what she had done, shrank even closer to the great sphere.

"Now you listen to me," Jerry commenced, biting his words sharply.

Young Egbert pounced upon the lever with triumphant haste. His small, grubby fingers tightened, swung hard toward the right. As far as it would go. The great tubes flared into blinding blue streaks; the soft whine crescendoed to a howling roar. The reflectors blazed with crackling energy. A million volts seared and crashed into the ice-covered sphere. Within, liquid air was solid air; a tiny globule of helium became nodules of frozen gas. The ham fell with a splintering thud as the tortured cord, brittle beyond all imagining, snapped in two.

The boy, frightened at the blaze and the noise, howled and scurried for dear life to the farthest end of the laboratory.

Kay swung around, cried out in fear. The frosted crystal was opening, dissolving before her very eyes. Inside, mouse, canary, chair, bread, ham, water, became vague, indistinct, shifting from hard solidity to a nebulous tenuosity, behind which the machines and walls of the laboratory wavered and grew momentarily clearer.

The girl's desperate eyes swerved to the bolometer. The needle was tight against absolute zero. Then, suddenly, as thermo-couple misted into nothingness within the globe, the needle sprang back to twenty-five degrees Centigrade. Room temperature!

The next instant it happened!

Kay felt the sudden tug, heard the howling noise that enveloped her. With a great cry she threw herself backward. But it was too late——

III

THE NOISE, the increased flare, the wail of Egbert, Kay's scream hard on its heels, caught the milling group, pushed them around in gasping astonishment. Jerry, halfway through the group, pivoted, saw the incredible event

just as it happened. With a snarling oath he lunged forward, bowling the physicists out of his way, fear like a great hand clutching his heart.

The huge *swoosh* of air caught him as it did the others. It roared like an express train pounding along steel rails; it swirled with cyclone force; it scattered heavy instruments like chaff in its path; it knocked men right and left like ninepins; it picked Jerry off his feet, smashed him into a heavy chair, sent him stunned and bleeding to the floor.

In that second of screaming madness he saw everything to the last startling, crazy detail. The great tourmaline sphere had opened into nothingness. The interior was a phantom, tenuous outline, a vague blur of ghostly matter. The walls of the laboratory were solid behind. Kay's body, slender, resilient, was curved like a bow, convex toward the sphere, as if she were being pushed by irresistible forces. Terror and strain were on her face; her lips were parted in a dreadful cry.

Then, even as Jerry smashed headlong into the chair, he saw the girl catapult toward the misty globe, pass without a stagger, without a jar, through what had been inches-thick tourmaline walls, clear into the center of the nebulosity.

While Jerry sprawled and slithered in frantic attempt to heave himself erect against the rush of air, his horror-struck eyes held on those of the girl. There was surprise, something else within their depths. Her mouth moved as if she were shouting, but no sounds came. Then her eyes widened, and her body, exposed to the still-rushing waves of force, seemingly suspended on nothingness, began to blur. The sphere was gone, vanished; so were the objects Jerry had placed within.

Then Kay Ballard, too, was gone, vanished, like a clap of thunder, like lightning that had blinded with dazzling flare and become utter night again. The cyclone died down as suddenly as it had come; the confused cries of the men, the toneless shrieks of Mrs. Wiggins no longer faked hysteria, the half-frightened, half-gloating wailing of young Egbert, muted into hushed silence.

Jerry was already pounding across the room, hurling the lever back to zero position. A million volts seared and died; the tubes went dark and the reflectors quenched their light. Then he whirled, dived for the place where the tourmaline sphere had been, where Kay had stood, incredibly within its closed interior.

The wild frenzy of his rush carried him over the smooth expanse of floor; his sudden, frantic leap cleared not an instant too soon the pit in which the globe had rested. His hands extended in vain to brace himself against solidity, against a mass that *must* be there.

He crashed through thin air, went staggering with the momentum of his body toward the huddled group of men. Edna Wiggins had fainted in earnest, but no one paid her any attention. Young Egbert thought it time for him to be going. He quietly eased himself out of the room, raced for the waiting limousine, and stampeded the highly uniformed chauffeur into instant flight for the Park Avenue penthouse that was more Renaissance palace than home.

"My Lord!" said Dakin over and over again. It was incredible, impossible! Not a minute before there had been a solid, substantial globe, a girl of extraordinary charm and beauty; and now—there was only the stark emptiness of the floor, the huge magnets thrusting at nothingness, the gigantic reflectors enringing a sphere from which all substance had fled.

Clamor rose again; shoutings, confused questions bordering close on panic.

"For Heaven's sake, man," screamed Marlin, "what have you done?"

But Jerry was beyond hearing. Grim-faced, desperately, he was swinging from machine to machine, reversing levers, shifting processes, slamming waves of heat into the silent space, trying with every resource known to science to undo that which had been unwittingly done. The sweat poured in little streams from his body; the temperature of the room grew to furnace-heat, but nothing happened. Both tourmaline sphere and Kay Ballard were irretrievably gone!

IT WAS DAKIN, kindly and spare of build, who forced him to quit his frantic efforts. He led Jerry gently to a chair, saying: "Don't take on so, Sloan. It wasn't your fault. You had refused to be stampeded into an experiment which you hadn't checked in advance. It was that young imp of Mrs. Wiggins' who was responsible for the tragedy. Pull yourself together, man. We'll have to think this thing out clearly."

Jerry stared with haggard, hopeless eyes at the mocking sphere of vacancy. "I should have known," he cried fiercely. "I should have been prepared. Kay! Kay!"

There was danger of madness in the terrible agony of this young man, thought Dakin. Evidently he had been deeply in love with his very personable young assistant. Poor girl! What a dreadful fate! To disintegrate and vanish like a puff of smoke before their very eyes. Dakin shuddered, pulled himself together. And, being wise in the ways of human nature, he adroitly turned the subject.

"But, my dear Sloan," he protested, "what *did* actually happen?"

Jerry swung on them all, taut, bitter. "Don't you see?" he cried. "I should have known; all of you should have sensed what was coming. I succeeded, only too well. I stopped the swiftly moving molecules in their tracks. I stopped the swifter atoms themselves, the very electrons, in their orbits. Motion died, and absolute zero of temperature was a reality, perhaps for the first time in the history of the material universe."

"But why," submitted Marlin in hushed bewilderment, "did everything—uh—vanish?" He had lost his arrogance completely.

"A very elementary proposition," Jerry said with fierce contempt. "When motion ceases, matter—visible matter—must die with it. What are the solid-seeming substances we see? An extension of extremely rapid movement. Nothing else. The diameter of the average molecule is two one-hundred-millionths of an inch. Tremendously below our range of vision. We see them in the mass only by the extension of their speeds. And the electrons themselves within the atoms have also stopped. Their diameters are 4x10-13 centimeters. Inconceivably tiny. Stop *their* motion and matter, as we know it, vanishes. The interior volume of an atom is a vast globe of emptiness. Jeans has represented it as several wasps buzzing around in the tremendous void of a Waterloo Railroad Station in London. You see the wasps while they fly. Search for them when they hang motionless on walls or ceiling, and the task is futile."

His eyes clung desperately, hopelessly, to that void within the circumscription of the reflectors. "She is in there," he said, pointing, "even now. Yet for all we can do, she might just as well be outside the universe, in another space, another time."

Bellew, a small, dapper man, whose specialty was thermodynamics, spoke up. "You applied heat to the area. The energizing waves should have been absorbed by the moveless electrons, kicked them back into vibration. In other words, we should have seen the—ah—vanished substances, even though"—a

faint tremor passed over him—"they might not be—ah—exactly in the same form in which they vanished."

Jerry shook his head tragically. "Millions of volts went into stopping them, into locking up their energy of motion. Each electron, each proton, is a closed cycle of potential energy. I tried reversing the process. I increased the voltage. The impulses should have done what you say. But they haven't. Either the closed cycle is a stable state which no power we possess can change, just like a spring-lock door which requires only a slight shove to close, but once closed cannot be opened again without huge exertions of force—or else——"

He sprang violently from his chair; it went crashing. His eyes flamed. "By Heavens, I think I've got it. What I had said before at random. Our space time is an attribute of matter. Without matter our universe fades and becomes insubstantial. But matter is also an attribute of energy, which is motion. The electrons, protons, what not, lost their kinetic energy. They no longer exist. Or rather, the space time in which they were wrapped, the space time with which we are familiar, has ceased to exist with relation to the tourmaline sphere, and—and——" He bogged at the mention of Kay's name. It stuck in his throat. The others carefully averted their eyes at his grief. With an effort he stumbled on:

"Perhaps they—she—are in an entirely different order of space time, a new universe, occupying that space, yet infinitely remote. Perhaps, even, they exist in that strange dimension, live, move and have their being, just as——" His lean jaw tightened into hard knots; his face grew grim with an intense resolve. He was speaking to himself now, softly, as if the hushed men in the room did not exist.

Edna Wiggins was coming to, making huge moans, but no one even flicked an eyelid in her direction. All eyes were fixed with unbearable intensity on the young physicist whose loved one had vanished into thin air.

"Of course," Jerry whispered to himself, "they are a vacuum in our universe. That was why the air rushed in with such force. She is still there, and I—I am going after her."

Dakin put his hand timidly on the young man's shoulder. "You don't know what you're saying. Perhaps a little sleep——"

Jerry laughed harshly. "I am not crazy, if that's what you mean."

"But how——"

"The same way Kay went," he answered promptly. "I'll build another sphere, repeat exactly what has happened by accident to-day. I—I think I can bring both of us back to this space-time existence. If not——" He shrugged, and fell silent.

They stared at him in awe, these scientists, practical, efficient men, not given to sentiment or display of emotion. "Greater love hath no man than this that——"

Bellew broke the insupportable silence with a matter-of-fact objection. "Granting even your theory, Sloan, granting even you can find the sphere in that other universe, Miss Ballard is dead, irretrievably so. No human body, no life as we know it, could survive the intense cold to which she has been subjected. A man frozen to death remains dead, no matter what is done to restore the energy of his component molecules."

"That is only because the process of freezing was long continued," Jerry responded. "The organic molecules had time to change chemically into other forms, shift their mutual positions. That is not the case here. The whole damnable affair took only a second. Every molecule, every atom, every electron, was stopped in its tracks. There could not have been any relative change of position, of form."

They argued it out until voices were hoarse, and tempers exacerbated, but nothing could be done with Jerry. It was suicide; it was worse, they said, until finally they had to give in to his dogged, stubborn determination.

Mrs. Wiggins, wide awake now, and thoroughly cowed at the disaster her darling child had brought upon them all, hysterically agreed to furnish the sums necessary to repeat the experiment. Provided, of course, there would be no prosecution of her precious brat, no damage suits, to which Jerry agreed. As if, he raged, all the money in the world could compensate for Kay Ballard.

IV.

A WEEK passed. A week of driving furious energy. Jerry Sloan was already a man wrapped away from the world, of things as they are. He neither slept nor ate nor seemingly tired. Workmen scurried with frightened celerity at the harsh whiplash of his voice; the laboratory seethed like a spouting volcano. Jerry was a monomaniac, a man possessed of a single, driving idea. Faster, faster, forging on with insane energy. His cheeks hollowed; his eyes fixed on far-off things.

The image of Kay Ballard never left his haunted vision—that last terrible scene as, with outthrust, imploring arms and look of startled surprise, she faded from the universe of familiar things.

Jerry held on to that desperately. She *must* be alive—if life it could be called—in a new dimension, a new existence, waiting for him to follow and rescue. He permitted himself no other thought, else he would have gone mad.

Edna Wiggins stayed discreetly out of sight. Young Egbert was shipped to an expensive private school in California—as far away as possible. Nightly, Mrs. Wiggins dreamed that the police were coming for her darling brat to drag him into durance vile, and she woke in sweaty fear. Thus it was that she signed checks for Jerry's work with feverish haste, not stopping to argue or quibble over vouchers.

Forbes Dakin stuck loyally by Jerry. He assisted, advised, expostulated that the hollow-eyed young man get sleep, take nourishment; subtly he tried to dissuade him from his crazy venture. To Dakin, as well as to the others, it was deliberate suicide. But Jerry was deaf to all entreaties. Kay was out there, in the infinite, calling to him, waiting with the growing fear that he would never come. It drove him on to even more tremendous labors.

Finally, a new tourmaline sphere rested in the floor hollow within the circumscription of magnets and parabolic reflectors. Inside its clear depths hung a ham; a white mouse gibbered and squeaked; a canary ruffled its frightened feathers; a chair stood in the accustomed place; water filled a tank; bread; iron; everything was exactly and meticulously the duplicate of that first ill-fated sphere. Jerry had tried to reproduce to the minutest detail the material equipment, the sequence of events.

"The timing, the power we are to use, even that last quick jerk of the lever, must follow exactly what happened before," he told Dakin, who had consented, albeit reluctantly, to set the switches and the rheostats. "With similar forces and similar masses, the chances of my finding Kay are so much more likely."

Dakin nodded wearily. He was frightened, now that the zero hour had come, but it was too late for him to back out. One look at Jerry's burning eyes and grim, set face showed that.

Dakin took his place at the panel board. Jerry stood near the magnet switch, even as Kay had done. The routine was carefully gone through. He sent the juice surging through the magnets, waited for polarization for five exact minutes.

Then Dakin set the rheostat lever in the first notch. The blue lights glowed again in the concentric tubes; the atmosphere was filled once more with the pungency of ozone. The reflectors dazzled as the initial voltage hurtled upon the doomed sphere. When the bolometer registered two degrees Centigrade, Dakin set the lever up another notch. It had all been carefully rehearsed.

Frost thickened on the crystalline surface; the little animals within stiffened with cold. The needle swung steadily to the left, retracing exactly what had once before occurred. Over, over, while the two men watched with bated breath. Minus two hundred and seventy-two degrees, slower, then the needle quivered and stuck. The temperature at which helium solidifies!

For ten minutes they waited, ten long minutes that seemed eternity. It represented the interval during which Jerry had argued with Mrs. Wiggins before young Egbert had taken their destinies into his own grubby fingers.

Jerry swung around, cowered almost against the frozen surface of the globe, even as he remembered Kay had done. Eight minutes, nine minutes, ten, while his heart pounded with suffocating thunders and his breath was a tight constriction in his throat. Suddenly he nodded. Dakin shivered, implored him with anguished eyes. It was still not too late to back out. But Jerry shook his head frantically. The precious seconds were slipping. With a groan Dakin threw the lever violently over to the last notch.

A blinding flash, a surging roar; a million volts battered into the sphere. The ice-covered surface opened, melted into hazy nothingness. Jerry threw himself around even as Kay had done. The events of a whole lifetime rushed through his brain, like those of a drowning man, of some one falling through space. For a single, tiny moment fear overwhelmed him, fear of that dreadful unknown into which he was voluntarily casting himself. Almost he sprang backward, out of the range of those fearful, beating impulses. Then, as in a dream, he saw the features of Kay shimmering before him. He gritted his teeth, held firm.

Then came the blast, as the air rushed into the vacuum of the halted atoms. It caught him, hurled him headlong, straight for the center of the misty globe. A great cry tore involuntarily from his throat as he swept, without a stagger, into the swirling interior.

He was curiously light. He floated in a current of illimitable forces. Red-hot pincers seemed to tear his flesh and bones apart. Up above, all around him, lights wavered and danced. The room was a roaring haze. Through swirling currents he saw Dakin, mouth open, eyes filled with terrible fear, darting frantically for the lever, thrusting it back to zero.

Jerry found himself suddenly smiling. The gesture was a duplication of his own former movements, and like it would be too late. But there was no doubt that poor Dakin was scared, would give anything now to undo that to which he had been an accessory.

Suddenly a cry of surprise tore from Jerry's lips. The tearing, ripping sensations had ceased. A sense of well being invaded him. The crystalline sphere, the chair, the caged animals, hitherto vague, insubstantial, ghostly, were swimming back to solidity, to hard, tangible surfaces. But the great laboratory, the magnets, the pounding, flaming reflectors, the walls with their panels and shiny surfaces, Dakin himself, misted and fled from his senses like the tenuous wisps of a waking dream.

"Dakin! Dakin!" he shouted. "What's happening to you? Where are——" A soundless explosion scattered his amazed senses into oblivion. He knew no more——

OUTSIDE, Forbes Dakin stared aghast at the emptiness where the tourmaline sphere had stood only a second before. It had vanished; so had its occupant. Young Jerry Sloan had catapulted into a new order of things, had commenced his tremendous journey beyond space and time itself in search of his vanished sweetheart. Or else he was dead—he and Kay Ballard—utterly, irretrievably dead, as no human beings had ever been before.

With a sharp cry Dakin rushed out of the laboratory, ran hatless and coatless through the long shadows of that June afternoon as if pursued by scourging furies. A white-haired, gentle man, panic in his eyes, oblivious to the curious stares of passers-by. A policeman caught at him as he fled.

"Here, what's the trouble?"

But the elderly physicist babbled unmeaning words, thrust off the grip of the law with a sudden twist, and was gone on his aimless race. The policeman looked after him doubtfully, shook his head, muttered to himself about old men drinking more than they could stand, and resumed his slow, majestic circuit——

It had been Jerry's strict orders that the laboratory be left untouched, exactly as it was on the momentous occasion when he first started his search for Kay. Otherwise, should they ever be able to return, disaster might ensue if they materialized within the solid confines of other objects.

These instructions were meticulously obeyed. Dakin, recovered from his senseless flight and mightily ashamed of himself, sealed the house just as it was. All doors were carefully locked but one. To that he held the key. No one else was permitted to enter.

Every day, promptly at five in the afternoon, the elderly physicist unlocked that single door, entered the laboratory, and sat in a chair well removed from the depression in the floor, until six o'clock. Then, with a sigh, he arose, took a last, lingering look at that vacant, unmoving space, at the silent magnets and the dull reflectors, set his hat on his head, let himself out of the house, carefully locked the door with a double lock, and departed to his own bachelor quarters.

Every day for a month Forbes Dakin repeated this undeviating ritual. He was a methodical man, and he had no family to expostulate with him. Strange feelings tugged at his withered heart. He had learned to love Jerry as a son during that frantic week of preparation. And now Jerry was gone, as was that slim and lovely girl who had been his assistant, and never again would he see either of them. Heaven knows what manner of thoughts went through the old man's head as he sat there, an hour each day, day in and day out, staring into that emptiness where spheres and warm flesh-and-blood humans alike, had vanished into—what?

At the end of the month Dakin felt his hopes slipping. Not that he had really expected anything else. Other matters intervened. Work that must be done. So he cut down his visits to twice a week, then to once a week.

A year passed. The dust silted through tightly closed windows and doors, and made a thin carpet over apparatus and undisturbed floors and furniture. On the first of every month the old man let himself in, hopelessly stared with aged eyes at the tragic area, and let himself out again softly, quietly, as if he were afraid to awaken the sleeping echoes.

The years rolled on. The tumult, the noise of the astounding disappearances had died in the world. Edna Wiggins, more mountainous than ever and mumbling toothlessly, had other worries. Egbert had been expelled from college, had forged her name to certain checks. It required all her influence to keep him out of jail.

The very names of Kay Ballard and Jerry Sloan were forgotten. Only in Forbes Dakin's heart were they still enshrined, and until the year of his death, he made his monthly pilgrimage to the tomblike house with religious fidelity.

Then he died. In his will were instructions. Never was the house to be torn down, or disturbed in any way. Once a year tins of food were carefully to be replaced within the laboratory; once a year trustees were to air the place and seek for evidences of the departed. Telephone connections were to be left intact, in case——

The instructions were carried out faithfully, albeit with many shrugs. Dakin had left ample funds for that purpose, and the trustees were well paid for their simple duties.

The years became decades, the decades centuries. The city grew to a marvelous thing of soaring colors and brilliant façades. The telephone gave way to television. Rockets pierced the stratosphere, made their initial flights to the moon. Interplanetary communication became an established fact; mankind grew in knowledge and power. New and impossible inventions became commonplace. With one exception—the secret that Jerry Sloan had possessed, the secret that had been his doom and the doom of that ancient girl he loved.

The house remained. A dingy, timeworn structure of indestructible stone. Generations of trustees remembered but one clause of that age-old will. The building must never be destroyed, must never be disturbed.

That grew into a tradition more immutable than the laws of the Medes and the Persians. All else was forgotten. The house became a monument, a shrine to departed generations. It was sealed beyond all possibility of entry. Fantastic legends grew around it. Within its foul and musty interior, huge machines slowly rusted and rotted away, ready to shatter at the slightest touch. The moveless dust lay thick on everything.

Then, three thousand years later, war flared. War between the planets. A Venusian fleet slashed out of space, dropped explosive spores upon the ancient city of Earth. There was a tremendous puff, and city and lofty towers of strange, new metals and millions of swarming mankind disintegrated into mile-high columns of flaming dust. The laboratory of Jerry Sloan was no more!

V.

JERRY felt curiously free and light. Just when it was that he awakened from his trancelike state he did not know. His eyes were open, and his brain functioned with a strange new headiness. When he moved, it was without effort, without that feeling of straining muscles, of resistance within the body that is so normal and taken for granted in an Earthly existence. He might have been awake for seconds only, or it might have been for unimaginable centuries; he had no manner of deciding. The time sense was curiously lacking.

He stared around him. He was within a great, hollow sphere, whose bluish tinge made transparency a matter of definite angles of vision. Two cages hung from near-by supports. A bright-eyed mouse examined him with intense curiosity, while a canary preened itself, cocked its pert little head and trilled with carefree forgetfulness of all but the immediate present—the here-now of time and space.

Jerry's eyes traveled farther around the curving walls of his globe. He knew these things, recognized them for what they were, yet his brain, smoothly functioning though it was, had not yet adjusted present with past and future. There was a tank of water near by, its liquid surface smooth and rippleless. A

loaf of golden, crusty bread looked hungrily inviting on a chair, and a great ham lay on the crystal floor, with a broken cord trailing from its brown rotundity.

Jerry blinked at it, and uttered a startled cry. That homely reminder of Earth coördinated hitherto disjointed processes within him. He remembered now. The tourmaline sphere opening up before him like a mirage; the great swish of air that hurled him into the vacuum; the last, bitter sight of Dakin frantically reversing the lever; the swift blurring of the outside world, and the final blast of oblivion.

"Kay!" The name flung itself against the confining walls, boomed hollowly in his ears. She should be here, next him, with her dancing eyes and impish smile, welcoming him to this new existence, maintaining with precious dignity that she had not been afraid, that she had known he would follow to rescue her.

But Kay was not within the sphere. A frantic fear drove him senselessly around the small confines, made him stumble into the chair and send it crashing, and the loaf of bread skittering almost into the tank of water. That brought him to a full awareness of his situation. Bread and water and ham! Who knew how infinitely precious they might prove before this insane adventure was over?

He rescued the loaf of bread, and sat down to consider the situation carefully. Something had gone singularly astray with his calculations. Up to a certain point they had been perfect. The globe and all its contents, including himself, had materialized in this strange new universe, even as he had suspected. Matter carried its own space time along. When motion died, the universe changed; the old wrappers disappeared and the new ones took their place. Life evidently continued, different no doubt, though as yet he had no means of detecting any particular changes.

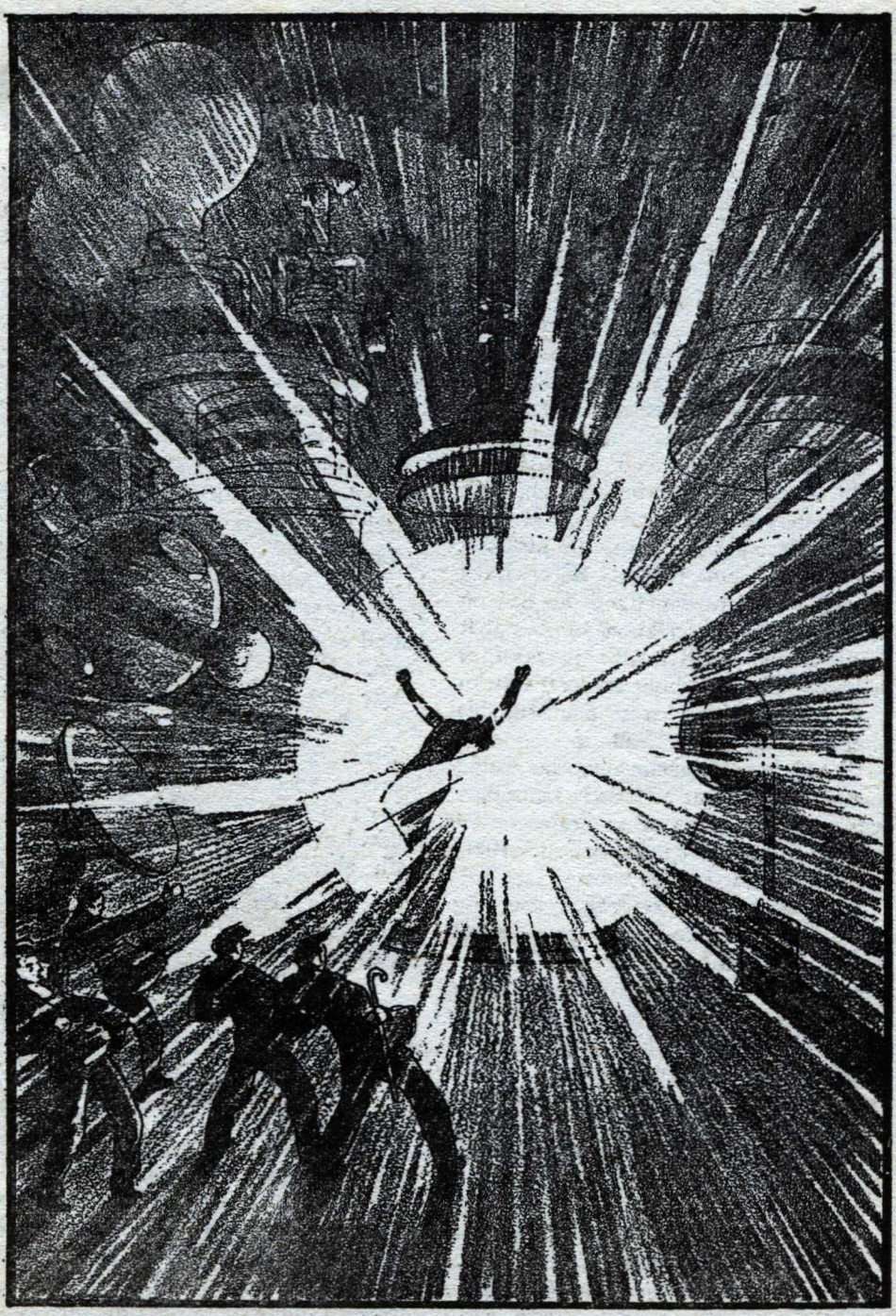
But something else had happened. By placing the second sphere exactly in the situs of the vanished one, by reproducing with painful fidelity every detail of the initial catastrophe, he had hoped and expected that they would materialize in the new space time simultaneously and co-existently. In which case the two spheres would have coalesced and he, Jerry Sloan, would have found Kay at his side.

Yet Kay was not here. That was a self-evident fact. It was that cursed time intervals of a week on Earth. He had not dreamed it would matter here, but it did. Either that, or there was movement in this universe, a movement that had carried the other globe far out of his reach. He arose excitedly. What a fool he had been! Of course there had been movement. He had forgotten completely that he had not, could never, in the nature of things, have reproduced what had once taken place. That week of Earth time had been fatal. A second would have been as bad.

For the Earth was not still. It rotated on its axis; it whirled around the Sun; it was carried in the sweep of the solar system across the galactic Milky Way; it partook of the unimaginable speed of the expanding universe. And they were no longer subject to Earth laws, to gravitational pulls. A week apart! He laughed harshly. Millions of miles in the space of the old! What incomprehensible infinities in the space of the new!

Very slowly he drew from his pocket a tiny mechanism. It glittered mockingly in his hand. On that he had pinned his hopes of releasing the stored potential energy, of vibrating themselves back again into the universe of material things. Now it was a worse than useless thing.

Kay was goodness knows where, and even if she were at his side, they would never dare return. Rematerialization might find them in the frightening void



They saw the girl catapult toward the misty globe, pass, without a jar through what had been inches-thick tourmaline——

between the planets; it might catapult them into the blazing maw of the Sun itself; or even, for all he knew, on the ragged edges of some extra-galactic nebula.

JERRY lifted his hand in impotent fury to dash the mockery of that mechanism to the shattering hardness of the tourmaline. A sudden access of sanity held his arm, and he replaced it carefully in his pocket. He sat down again, watching the unthinking animals. He envied them their timeless complacence. Life just now was pleasant; what mattered the future? For himself, he saw it all too clearly.

He had food and drink enough, with stringent rationing, for a week, or even two, of Earth time. But the air supply! That was vital! If he breathed as deeply and as rapidly as he had on Earth, a hasty calculation showed that he had not sufficient for twenty-four hours. His eyes clung speculatively to the animals. They were using up his precious supply. Now if—— He shook his head determinedly. He would not do it. It was not their fault they were here. Besides, what difference did it make? An hour more or less. Eternity would last just as long.

Suppose he sat quite still, conserving his energy! That would give added minutes. With a muttered oath Jerry was on his feet. He would not cling to life like that. He stared at the enveloping crystal for the hundredth time. And for the hundredth time a bluish-gray blankness met his eye. Impenetrable, soft, with a curious luminescense of its own that shed a concentrated light within the sphere.

Without quite knowing why he did it, Jerry flung himself flat along the concave of the globe. There was a kind of gravitational force inside the sphere. But there was no up or down. He could walk indifferently on what might be considered ceiling and what might be floor. Movable articles drifted steadily, inexorably, toward each other, requiring force to separate. As if, Jerry thought with a shiver, the globe represented a closed gravitational system, a solitary blob of matter in a universe of emptiness.

Sprawled out, face pressed close to the polarizing crystal, he squinted sharply through the shifting transparency. Nothing! With a groan of despair he turned his face as he lifted. His gaze made an acute angle of incidence with the tourmaline. His body stiffened; an exclamation ripped from his lips. He had seen something.

Unwittingly he had glanced along the particular plane through which the polarized light traveled unobstructed.

Outside was a strange universe, an incredible one. There were no dimensions, or if there were, Jerry's Earth-bound senses were unable to dissociate them. It was like a gigantic cinema, where near and far flashed over the self-same screen.

Strange, flattened shapes whirled and blurred with unimaginable rapidity. Weird distortions of startling colors blinked into view and blanked out again with abrupt finality. Orbs stretched like rubber bands to gigantic proportions and contracted with infinite speed to mere pin points of flame. A picture show, a phantasmagoria, a kaleidoscope of tumbling, constantly rearranging figures, strangely insubstantial, while all around stretched the gray luminescense of a space without height or depth or thickness, a space that was void and without form.

For a long time Jerry stared in breathless attention, his plight forgotten, everything but that weird show. Then suddenly the answers came to him. That which colored and formed a back drop for the hyperspace, the supertime into which he had been thrown, was the universe of his former being. Those

shifting shadows were the projections of solid, three-dimensional suns and planets and galaxies and nebulæ upon his present space and time. A magnificent peep show at which he was the sole and involuntary spectator. Somewhere in that fleeting exhibition was the Sun; somewhere among the most inconspicuous dots that flicked on and off like defective bulbs was the Earth, its nations, its endlessly striving people, its loves and sorrows and hopes and despairs.

He laughed aloud at that. It seemed so futile, so insignificant. What, for instance, was Forbes Dakin doing at this particular moment; what was Marlin, Edna Wiggins doing? Incongruously, the expression "Old buzzard!" formed on his lips. It brought a pang to him. Memories of Kay Ballard flooded him with unbearable longing.

A new fear was welling in him, a fear that would not down. The inconceivable speed with which those flattened shapes formed and re-formed, and dizzyingly blurred. What did that mean? Suddenly he knew, and with it the terrifying answer to his idle questioning.

Dakin and Marlin and Mrs. Wiggins were dead; had been dead for unimaginable ages. Perhaps the Earth itself was already a cold and lifeless ball, swinging around a crusted, darkling Sun. He was witnessing the birth and death of suns and planets and galaxies; each blanking was a death, each reappearance a blaze of new nebular matter. That accounted for the ceaseless blur. A thousand centuries of slow and ordered growth telescoped themselves into a second of breathing.

He remembered now. He was in an alien universe, a universe in which the electrons and protons and neutrons of his being had engulfed themselves upon the stoppage of their swift vibrations. Time here was adjusted to that moveless quiescence, or, what seemed more likely, the infinitely slow residual motion of mutual attractions and repulsions. This time sensation was normal to him now. The time of that other universe from which he had been thrown was now abnormal. An exhalation here meant æons there.

Grimly he considered that. Even if he could return, even if he found, by some wild coincidence, the exact spot he had quitted, billions and trillions of years would have elapsed. The old familiar patterns had vanished into the limbo of forgotten time; he would be more an alien even than he was here. He took a deep breath, twisted slightly, and saw something that was utterly incredible.

So near he might have reached it with his hand had the crystal walls not intervened, so far away that æons of endless flight might elapse before contact could be made, was a sphere. A tourmaline sphere, sharp and clear and transparent, moveless in the queer, flat void.

Jerry's heart stopped, then pounded with trip-hammer blows. Within its crystal round, sitting on the chair, chin cupped in slender hand, staring with eyes that no longer danced upon the circumscribing walls, was Kay Ballard! The cage doors were opened. The white mouse, brother to one he held imprisoned, gamboled sportively about her feet; the canary nibbled with greedy beak at the bread.

VI.

"KAY!" Jerry shouted insanely. It was more than incredible; it was impossible. She had reached this hyperspace a week before him, yet she was still alive. The food had not been touched; the air was still breathable. But of course! A week of Earth time meant so minute a fraction of a second in this sluggish eternity that to all intents and purposes they had reached here simultaneously.

"Kay!" he shouted again, and beat with hammering fists upon the crystal.

She did not raise her head. How could she hear? Sound required matter through which to journey. Who knew what strange stuff made up this hyperspace? Who knew what unimaginable distances separated the two spheres?

Time ceased to have all meaning for Jerry now. He shouted; he beat at the solid tourmaline; he flung himself along the concave surface, seeking somehow to attract the girl's attention. But still she sat and stared into dull and dreary nothingness, while the mouse and canary played unheeded about the globe.

The distorted projections of that other universe blurred with increasing speed; they vanished and did not reappear. One by one the misty lights flickered and went out. But Jerry did not see, or seeing, paid no attention. All his mind, all his soul was concentrated on that tourmaline orb, on the seated girl within. Nothing else mattered.

Then—it might have been minutes later, it might have been hours—Kay got up, ate sparingly of the bread, fed bits to canary and mouse, drank of the water. Listlessly she moved over the crystal, until her head stiffened, and her eyes jerked full on the prone figure of Jerry. Her startled look slid along the plane of polarized light. Her arms extended in involuntary appeal.

There they were, two human beings, each enshrined in a sphere of shining crystal, separated by unimaginable barriers, alone in the vastnesses of a space time of their own contriving. It was agony to see each other, to gesture, to beckon, and approach no nearer.

Yet, gradually, a measure of comfort grew on them. Somehow they evolved a system of code signals, semaphoring with angular positions of their arms, such as were employed by armies and navies in pre-radio days. They conversed, haltingly, it was true, but with unquenchable longing.

The hours passed unheeded. The air was staling slowly, yet at first they did not notice. Then Jerry heard a faint *"cheep."* The canary's beak was wide, gasping for air. Its bright beady eyes implored the man to help it in its strange predicament. Slowly its feathers ruffled and it toppled, to lie a moveless, rumpled ball. The young man realized now what it meant. The atmosphere within the ball was foul and heavy. His eyes burned and his head ached. He signaled frantically to Kay.

"Are you all right?"

She pressed close to her prisoning glass and smiled bravely. "Quite, my dear."

But it was obvious she was in distress. They took counsel. Movement to be reduced to a minimum, breathing to be shallowed as much as possible. But it was plain they could not survive more than an hour. And then——

"If only," Kay signaled in anguish, "we were together, tight in each other's arms. It would not matter so much, going out like this."

"I know," Jerry answered wearily. He stared with grim, desperate eyes at the iron bar. He did not intend suffering the agonies of the damned from slow, horrible strangulation. A crashing blow with that heavy bar on the tourmaline, a jagged hole, and the swift rush of foul air into the space vacuum without would bring merciful release.

He told Kay of that. The girl's face was pale, but composed. "It's the only way," she agreed. She was breathing heavily now, and a blue tinge was creeping around her delicate nostrils.

Slowly, inexorably, they lifted their respective bars of iron. Slowly, like automatons, they turned to each other. Separated in life by incredible barriers, perhaps in death they might once more be united. Who knew?

"Afraid?" Jerry whispered. A mirth-

less smile twitched over his suffering face. She could not hear, of course.

But she must have sensed what he said, for her head shook in brave negation. Her free hand lifted, went to her lips. A kiss wafted across the hyper space time for the first time in all its unthinkable existence.

Together they lifted the bars. Great pulses pounded in Jerry's temples. His eyes smarted and his lungs labored like bellows. He poised for the final signal that meant release from torture. He must hurry! Soon they would be too weak to bring the iron bars crashing. His left hand upraised. A twist of the wrist to the left, and Kay would know——

He started the irrevocable movement, held it frozen half way, then reversed with frantic, pounding gesture.

Things had been happening in their universe. Things that in their absorption in each other they had not noticed, or noting, failed to understand.

One by one the phantom projections had misted and faded, and none had come to take their place. The backdrop, the flat distortions, shimmered and disappeared, as if a master showman was tiring of his show, and slowly but inexorably was turning out his lights.

The strange, luminous gray of the ultrauniverse spread, gobbled up the blurring shapes. The colored flares were few in number now, and weakly flickering. But they seemed closer. The backdrop of eternal night closed in, was moving forward, shifting to the front of the stage, before the footlights, and advancing even as it faded and became a wraith out into the orchestral pit itself.

A wan, orange glimmer surged over the tourmaline spheres, infolded them in a haze of swift vibration that shimmered and danced like fireflies on a night in June. Jerry cried out, dropped his bar. It drifted softly, like a feather, to the crystal. Then all else blotted out in the strange new glow, but not before he had seen Kay whirl and stare with frightened eyes out into the engulfing space.

Suddenly he, too, was staring, forgetful of foul air, of nauseous headache. Something was outside his sphere. A blur of movement that shifted and gyrated with terrific speed. Formless, whizzing, yet somehow the thought hammered in Jerry's oxygen-starved brain that there was something strangely human about its queer vibrations. At times it seemed that a face, distorted, twisted out of all imagining, peered in at him. But the vision was so instantaneous, so utterly fleeting, that Jerry laid it to the poisoned air that clogged his veins, the close approach of delirium.

Yet he withheld that final blow. Instinct warned him to wait, even to the last gasp of suffocation. Within the echoing, semidarkened recesses of his brain he seemed to hear a voice, urging him to make no move. There were seconds when the eerie, formless blur disappeared, but it always returned. The intervals grew longer, the elongated face showed actually for split seconds of time. Certain tiny sounds tinkled in the tourmaline, as if——

VII.

JERRY LAY within the sphere, half delirious. The air was a fetid, noisome effluvium, which his lungs gulped and rejected. His throat was a fiery constriction, and darkness was filming his eyes. Perhaps that was why the orange glow seemed to become fainter and fainter, and the strange, superhuman face without steadied for seconds at a time, and the tinkling noises grew in intensity and duration.

He was drifting, drifting. The light was dying, but rocket flares exploded in his head. Death stole slowly over him. There was a sudden grinding noise, a

surge of something cold and biting, and consciousness left him——

Memories of childhood struggled bewilderedly through Jerry as he opened his eyes. Surely that noble, well-proportioned being with the benignant, superhuman features who bent over him was of angelic descent. Even such had he seen depicted in the genius-intoxicated drawings of that strange madman and ecstatic visionary of the eighteenth century, William Blake.

Something spoke within Jerry. It was not sound; it was not a voice; it was a series of thoughts incredibly impacting on his brain.

"Do not be alarmed," they soothed. "You are quite all right now. Breathe deeply."

Jerry obeyed the inner voice. It was good to draw into his tortured lungs the clean, sweet air.

"But who are you," he cried, "and how did you get inside the sphere?"

The man smiled. It illumined and transfigured his mobile features, made him almost godlike in countenance. "Strange sounds issue from your lips, O being from another universe who yet resembles so closely our own kind. I do not understand them. They are harsh and discordant. But your thoughts impact on mine and I understand those. There is a tradition," he mused, and the sentence pictures somehow arranged themselves in proper patterns to Jerry, "that in the misty, incredible antiquity of our own race it was necessary for primitive beings to make noises with their lips for communication."

"Then you have mastered telepathic conversation," Jerry said in awed tones. He still spoke; it would take him a long time to achieve the disciplined ordering of thoughts that came so easily to his mentor.

The man nodded. "For uncounted æons now. But to answer your questions: I am Horgo, of the outpost galaxy, Andromede. A hundred thousand light journeys ago two spheres of strange design emerged with infinite slowness, out of the formless void into which we were hurtling. Our instruments detected them first, as the faintest of faint impingements of ether stresses on delicate dials. My great great ancestor, and Lika's, too, famous scientists of that early time, discovered them.

"Yet the spheres could not be seen, for the ether particles held no vibration. A new, other-universe form of matter. They tried their mightiest forces, compounded of the last expiring gasps of stellar laboratories, to break them down, to penetrate their invisible, albeit rigidly impenetrable sheaths, without result.

"My ancestor was a great scientist, I have said, far in advance of his time. Even then the universe was dying. The expanding effect of that first great explosion of primal central matter was losing momentum, in accordance with the inexorable laws of thermodynamics. Matter was dissipating into waves of energy; waves of energy were spreading and thinning out as the universe expanded and created new space-time units on its far-flung outposts. Already the more central galaxies were dark and slowly vanishing. A moveless heat-death was holding them in thrall. Already the race of man had moved from the tiny galaxy it had inhabited since the farthermost reaches of time to the island universe of Oria. Then that, too, faded into the matterless, waveless uniformity of the heat-death."

Horgo stared out of the crystalline sphere at the gray waste with sad, weary eyes. The orange glow had gone; the flickering distortions were gone, nothing remained but gray, motionless nothingness. His thought processes slid into Jerry's brain again.

"From galaxy to galaxy we pushed,

ever outward, until we reached Andromede, the last outpost. Here the race was forced to halt. Beyond was neither space nor time. Yet, still the primal energy was strongest here, the universe still expanding, and creating new units of space and time as it rushed outward. But this could not keep up forever. My ancestor realized that. His instruments showed the slowing up, the enormous dissipation of energy into ripppleless waves. With a flash of genius he realized that these spheres, impenetrable to all their science, held perhaps the secret of a conservation of energy, of a self-contained system, that contradicted or defied the laws of thermodynamics."

JERRY had been hearkening to those inner thought patterns with growing amazement. Oria! Andromede! Good night! Those were the nebular galaxies he had known as Orion and Andromeda. Then he was back in his own universe, and Horgo, this superhuman, was perhaps the last mighty representative of his own race, left far behind in the dim reaches of Earth. His brain whirled. They had returned, been swallowed by the ceaseless expansion, but unimaginable billions of years into the future, when the universe had degraded into that moveless heat-death bath of which even in his primitive day certain scientists had spoken.

Horgo's face lighted. He had read Jerry's spinning thoughts. "Yes," he sent his patterns across, "we must be members of the same race. The extremities of time have met. The first primitive form and the very last. For nowhere else in the universe did we men who first had sprung from the tiny speck called Erd ever find life like ours. But to continue:

"My ancestor was short-lived. In those days lives did not extend beyond a thousand light journeys. Nor were his instruments as advanced as they were later to become. He labored mightily to break through those invisible spheres of locked-in energy. He did not succeed. His sons took up the task. They failed, too, but they managed to invent an infra-camera which photographed by a negative process. The lacunæ in the ceaseless flow of wave impulses that permeate the entire universe registered on the disks by their very lack of energy.

"So it was that you and your sister sphere first became visible. Judge of their surprise to find two beings in their hollow shells, rudimentary, it is true, but nevertheless somewhat similar to themselves. Unfortunately the pair seemed dead. They neither moved nor budged from their unnatural, rigid positions. A state of death or cataleptic trance at best. A lifetime of observation showed no change. But they did not give up their task, and took thousands on thousands of negative photographs of the spheres."

Jerry shivered as he considered what that meant. Thousands of time units of the order of light years had flashed by in the outer universe while he, inside the sphere, had not yet completed the simplest gesture. And Kay! The memory of her jerked him into awareness. He caught Horgo's arm in a grip of steel. His voice clanged harshly. "The girl in the other crystal globe! She is dying while we are doing nothing. You must rescue her at once."

Horgo winced at the crude concussions of sound. It was evident that uncouth noises had been obliterated from the dying universe along with speech. "You need not blast at me with frightful clamor," he observed mildly. "Think the thoughts you wish and I shall understand. But have no fear for the girl. Lika has entered her orb and even now is ministering to her wants. Her thoughts are a steady flow in my brain."

Jerry dropped Horgo's hand. Joy tingled in his veins. As long as Kay

was alive—— "Thank you," he started to say, caught himself, and thought it.

Horgo smiled approvingly. "That is better. To return to my narrative: It was in the next generation that the accumulated photographs showed that you were not dead. Your positions had changed, though to no great extent. That heartened the workers. They had discovered the secret of lengthening their lives to fifty thousand light journeys, though it was left to Lika and myself to find the true secret of immortality.

"An immortality"—he smiled sadly—"that seemed profitless and horrifying. For the universe was fast dying. It was only by the most tremendous exertions that we were able to concentrate sufficient of the feeble energy flow of almost vanished matter to keep ourselves intact, to keep our apparatus functioning. Soon that, too, would be gone. Yet ever, before our very eyes, were the visible signs that some one had discovered the secret of immuring energy in potential form. For we realized by now that you were alive, that your infinitely slow movements were the product of the infinitely slow corresponding motions of your constituent ether units.

"So we redoubled our efforts. Your spheres gradually grew to a hazy type of visibility, as our ether units slowed wearily down. If only we could break through before the moveless sea of thermal death sapped the last supply of our energies!

"The few who survived with us succumbed, one by one, fading slowly from view as their protons and electrons dissipated in a slow disintegration. We alone were left, Lika and I. Soon we, too, would fade into nothingness. Then, by a lucky accident, Lika stumbled on the solution. We staked every available source of energy on a last mighty effort. We floated in a sphere of force of our own contriving. The waveless, featureless universe nibbled sluggishly at its outer shell, contracting it slowly, but perceptibly, about us.

"With bated breath we threw the beams upon the spheres. With delight we saw them grow in clarity, saw them open along the beam path. The mighty concentrated forces, the essence of the universe, thrust aside the static unbreakability of your units, held them open long enough for us to push ourselves along the path and enter with the supplies we needed. Then the beams flickered and were spent, and the universe-resistant spheres swung back into place."

There was almost admiration in his piercing glance. "To think that you, of an unimaginable primitiveness in time, could have discovered this principle that, in all the intervening ages, had never been rediscovered."

Jerry started to explain, but Horgo's thought patterns stopped him. "You need not tell me. I know everything now; the principle you employed, the method. Remember I can read every thought that passes through your mind."

"Then no doubt you have read this, too." Jerry found himself moving his lips in spite of himself. It was terribly difficult to think coherently without speech. "What will be our fate?"

Horgo looked quizzically at him. "Fate? We shall live and have our beings within these spheres. Lika and I have the means of renewing air and food pellets indefinitely. Our time processes are slowed, yet to us they shall seem quite normal. That will give us an immortality of meditation and exchange of thoughts. For we shall teach you those secrets, also. Death shall come to us only in that vastly distant future when the infinitely slow vibrations of our ether units dissipate into the dead universe about us. By that time we shall have meditated sufficiently long to have achieved complete absorption into the final secrets of space time and

beyond. Then we shall welcome death. For nothing will be left."

VIII.

JERRY made a gesture of distaste. Such inactive contemplations were not to his fancy. At least, however, if Kay were at his side—— An irresistible longing coursed through him. Her lovely face rose before him in tantalizing detail; her warm, red lips, her merry eyes, that curve of throat——

"It is an unappetizing future you outline," he told the man of the future quietly. "But perhaps it will be bearable should Kay Ballard, the girl I love, share it with me. You must bring the spheres together, so that the four of us, your Lika and my Kay, may join us in that endless contemplation of yours."

Horgo looked at him in surprise. "But why?" he queried. "Why do you require physical contact with the girl you picture as loving. I do not understand that pattern. It is an incomprehensible thought which I have never read before. You will be able to exchange your flow of ideas with her. I shall teach you how. What more do you wish?"

Jerry restrained his surging vehemence. How could he explain his primitive emotions to this highly intellectualized man of the future? Love had died out of the universe æons before; that strange longing to be with your beloved, to breath the air she breathes.

"Nevertheless," he answered slowly, painfully, "I must insist upon our joining each other. It is a need that you do not have, that has evidently been bred out of the race. But we are from that long-distant past, Kay and I, when life was savorless without a mate, without some one to share your joys and sorrows in the flesh as well as by the impersonal coldness of distant telepathic communication."

Horgo shook his head in wonderment. "It was a strange time you lived in," he declared. "But the thing is impossible. Our beams of force were exhausted in the last mighty effort to penetrate your spheres; we have no other."

"Impossible!" Jerry echoed. "You, a man of who knows of trillionth centuries, still have *that* concept in your mental categories!"

The sarcasm was wasted on Horgo. These godlike beings were not given to petty, human emotions.

"Perhaps," he meditated, "it could be done. By the use of all our supplies and the materials you have within this sphere, I could build up a new force beam in a thousand light journeys. But——"

Jerry actually grinned. "You forget," he reminded, "that all our material is of the same order of energy. The iron bar equally with the tourmaline sphere, my body with that loaf of bread which to my primitive stomach is food."

Horgo's face cleared. "Naturally," he admitted readily. "I had forgotten that. You could break the sphere, so could the girl you call Kay. But then you have destroyed the strongholds which hold us intact from the heat-death that rules without. We shall be naked, unguarded. It would require tremendous dissipations of energy to force our way through a universe that no longer exists, to join the inmates of the other sphere. Our air supply must scatter at a faster rate when not confined. Gases, even in this potential state, have necessarily more freedom of motion than solids. And for what purpose? So that you may be in the presence of this girl."

He wagged his head. His logic was impeccable, his reasoning unanswerable. But Jerry was not content. He was ready to risk the loss of immortality if only he and Kay were together for what had once been a normal life period. But something else was dimly struggling

in the recesses of his mind. He exploded in a sudden shout that was a deafening clamor to the eternally silent Horgo.

"I'm sorry," Jerry thought shamefacedly. "But I had forgotten something I had." His fingers trembled as they produced the tiny mechanism from his pocket. "This," he explained in jumbled, confused pictures, "is an instrument I had evolved when I first went in search of Kay."

Horgo looked at it with interest. It meant nothing to him, naturally.

"It is," Jerry proceeded, "a tiny reproduction of the parabolic reflectors on my initial machine. Inside this metal attachment is a storage battery to provide the activating currents. I had set it in advance. Its action will exactly reverse what had been done before. The push-pull of the impulses will kick the moveless atoms into long-forgotten motion. Remember, they are both of the same order now, are normal with respect to each other. It will take time, of course, much more than the original process, for I haven't an immense voltage at my disposal, but gradually the electrons will swing farther and farther from the protons, until, under repeated impulses, they will tend toward their accustomed orbit states."

Jerry was sending out his patterned concepts with increasing confidence. "The slightest additional impulse should then precipitate them into their ancient grooves. Atoms once more will obey their original laws of motion. They will whirl within the limits of the molecules; the frozen molecules will lunge with renewed vigor, and matter will have been reborn—normal, energy-yielding matter."

HORGO was still puzzled. "I still don't see what you are aiming at. Granted that you can do this, and the analysis you have offered seems logically coherent, yet you have gained nothing. More, you have lost immensely. The universe is obliterated. Space time has died in motionless, equipotential waves. Your load of energy-producing matter will quickly dissipate into the void of nothingness, and ourselves along with it. It is a new and decidedly effective way of anticipating death."

"But don't you see what will happen?" cried Jerry, unwittingly breaking into speech again. "We shall have reproduced exactly the conditions that existed at the original birth of the universe. A central body of matter in the midst of nonspace, nontime. Matter that for some reason or other possessed enormous potential energy, locked-in, self-contained, as yet untranslated into kinetic energy. Something took place. Call it my activating reflector, call it what you will, but the tremendous potential was broken down. The vast store of energy at once released in a tremendous explosion.

"It acted on the void as it expanded, wrapped it around itself in a new space and a new time. The waveless heat-deaths of a million million former universes stirred under the expansion, rippled, puckered into the little nodules we call electrons, protons, matter. These in turn reacted and interacted. The explosion spread, like ripples in water from a hurled stone, creating new matter, new energy. A universe had sprung into being."

Horgo moved swiftly. His eyes burned into Jerry's. "Man of the past," he poured his thoughts, "I salute you! You have put the race that sprung from yours to shame. Always we had thought that original nexus of the expanding universe to be a mighty globe of matter. You have proved it is not necessary. The unlocking of kinetic energy in this one sphere is sufficient to re-create a new universe, a new space time. Proceed at once with the experiment."

Jerry flicked the tiny catch. Faint sparkles played over the metallic surface. "It will take some time," he said doubtfully.

"Time is a minor consideration," Horgo assured him. "We are immortal. I shall render you so while we wait, so shall Lika to the girl called Kay. It is a simple operation on the interstitial glands that control the processes of growth and decay. And I shall also teach you to send your thoughts over the void, so that you may in the meantime communicate with the girl you say you love."

The word amused him, for a smile illumined his face. Then he set to work——

Jerry awoke to find himself seemingly unchanged. The prospect of immortality somewhat appalled him, yet somehow, instinctively, he felt that the operation could not succeed. His body and Kay's were not sufficiently evolved for that. What was far more important, however, was the surge of Kay's eager thoughts across the void. They were heartening, though curiously unsatisfying. He grinned wryly to himself. They were primitive barbarians, after all, accustomed to the crudities of sight and sound and touch. Kay confessed she felt the same way.

It took an interminably long time. Horgo and Lika did not seem to mind. They were superior to such human frailties. Twice the stored power of the battery ran out without perceptible results. But Horgo did magical things with the iron bar, things that Jerry, in spite of attempted explanations, could not follow. As a result the battery was recharged, and the surging impulses continued to make pin points of flame over the reflector.

Jerry felt less and less secure as the hours dragged out and nothing happened. His initial confidence, his rash feeling of almost superiority to his companion, gave way to discouragement and final despair. "It won't work," he said dully. "I've been a fool."

"It will work," Horgo stated with confident calmness, and returned to his serene meditations. Time and again Jerry had tried to penetrate the terrific abstractions among which Horgo soared with effortless ease, only to fall back dazed, bewildered, aghast at the incomprehensibilities of that ultimate wisdom. Once more Jerry felt curiously humble.

THEN, one day, counting by ancient Earth time, Horgo raised his calm eyes and said simply: "Prepare yourself. Our universe is about to expand."

Jerry had been wandering around the sphere like a caged lion. Even thought exchanges with Kay had not been able to stop the fret of such lengthy inaction. Now he jerked to a halt, startled. Was it possible? There *was* a queer feeling about himself, now that he thought of it. A certain trembling, a shimmering, that communicated itself to the walls of tourmaline, to Horgo, too. Everything was hazing, changing. He could not see——

He seemed to blast open. A blinding flare of insupportable light enveloped him, tore him to pieces——

A universe was being born——

Jerry was dreaming; he was sure of that. For otherwise how could his head be pillowed on the soft warmness of Kay's breast, and her voice, unheard so long, be beating with thrilling accents at his ears.

He refused to open his eyes. "If this be a dream," he muttered, "I don't want ever to wake up."

"You silly goose!" Kay laughed and cried all in one. "It's not a dream, and unless you open your eyes and look at me at once, I'll let you drop."

The threat had its prompt results. After the first precious minutes of reunion, Jerry looked around. Horgo and a stranger, more subtly rounded and feminine, who must be Lika, were

a little apart, smiling at them, albeit a trifle puzzled at these young primitives' transports of happiness.

"The explosion passed us in a flash of light," Kay declared, "but it did not even jar our sphere. We had to smash our way out with the iron bar when Horgo came."

They were within Jerry's sphere now. Horgo had made a passage with the bar, had taken the reflector to Kay's still invisible globe, guided by the impacting thoughts of Lika. As they emerged, they had metamorphized into normal matter, while Jerry still lay unconscious, and the released energy of their beings had gone flashing outward to assist in the swift expansion.

"Look outside," Kay said happily, a little catch in her throat. "Our universe, made just for us, being born before our eyes."

Jerry swung his gaze with reluctance from her flushed face, peered through the tourmaline. The gray void had retreated. Already flaming energy had licked into primal atoms, coalesced in huge, still formless suns. Gravitation sent them swirling, made gigantic spirals. Great nebulous masses rushed past each other, tore from their blazing garments ragged shreds of flaring matter that whirled and spun around the greater bodies.

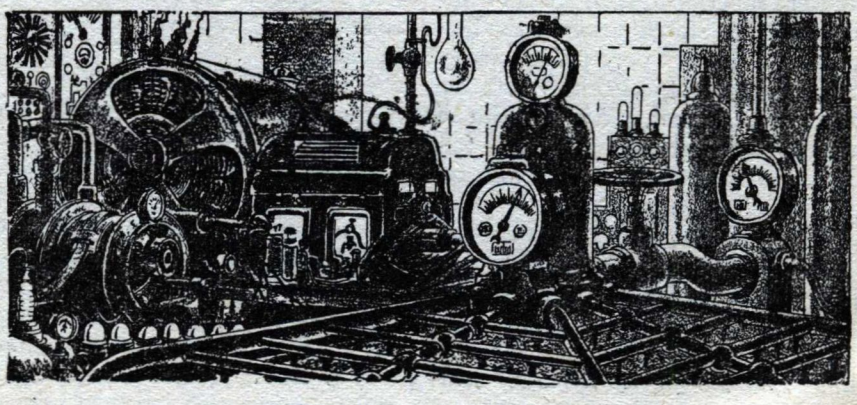
"Planets!" Jerry declared in awed tones. "Planets that in billions of years will cool and spawn new life, new men, new supermen. The endless cycle of eternity beginning all over again."

Kay squeezed his hand. "We shan't have to wait that long," she said softly. "I have been communicating with Horgo and Lika. They assure me that with all this boundless energy at their disposal they can produce in short order a planet sufficient for our needs, with air and water and the raw materials of life."

Jerry returned the squeeze with interest. Far out, the waves of expanding light illumined each new conquest of exploding forces over the timeless void. The frontiers of the universe-to-be were pushing outward with accelerating speed.

"Look!" He nudged Kay. "Horgo and Lika! I think there will have to be two planets. Something tells me we've set them a horrible example. These icily cold superbeings of the world's decline have learned the meaning of a new and incomprehensible thought concept."

In truth, the pair were sitting apart, holding each other's hands with unaccustomed awkwardness. But there was no disputing the ardor that burned in their eyes.



Then, as they watched, Hardy went cold with fear!

Pre-Vision

by John Pierce, M.S.

"While the advanced (anticipated) potentials, as well as the retarded potentials, satisfy the electro-magnetic equations, the former have generally been discarded for the reason that it has been more in accord with the trend of scientific intuition to consider the present is determined by the past course of events than by the future. However, if it is once admitted that the present state is uniquely determined by any past state, it follows that the future is also determined, and hence the employment of a future as well as a past state in

specifying the present marks no inherent departure from our accustomed methods of description——"

Leigh Page
"Advanced Potentials and Their Application to Atomic Models"
"The Physical Review," September, 1924.

HARDY STUART gazed at the flickering screen. Green blobs of fluorescence danced on its surface. His brow was knit in perplexed disappointment. Suddenly the blobs wove themselves into a picture—a rough, shimmering representation which Hardy recognized as that of the laboratory in which he stood, but this scene of the future, for so it must be, was strange. It showed a body lying on the floor, with a figure beside it, bending over. Other figures—all very indistinct and unrecognizable, rushed in through the door——

Then, suddenly, the image disappeared. A dull, red glow took its place, shining through the green fluorescence which still seemed to linger on the screen. Hardy gave a cry of alarm and put up his hand to shield his face, but he was not quick enough. Something hurled itself from the screen, and, as he turned, struck him on the side of the head. Then he sank into unconsciousness.

His next impression was of crying, "Rhonda, an image!" Collecting his wits, he realized what had happened.

Yes, Rhonda was there, holding his head on her lap and wiping the blood from his temple. He glanced up and saw the shattered screen of the synthesizer. Then he realized that Rhonda was speaking.

"Don't move," she said. "I've called your friend Dr. Morris. He'll be here presently——"

"But Rhonda," he insisted, "I got an image——"

"There," she interrupted, laying her hand on his temple. "Just relax. Don't worry about it now!"

Hardy had rapidly gathered his wits, though a sort of physical numbness from the blow still hung over him. "So," he thought rather bitterly, "even now she doesn't believe anything happened. She thinks I'm out of my head from the blow." Somehow it hurt him—why it should he didn't know. Certainly no one else would have believed. Perhaps she was as sensible as the rest.

No one denied Hardy Stuart's brilliance, even in the most sanctimonious scientific circles. "He's the man who, at the age of twenty, found the Stuart-Binnet solution for the unified field equations," they would remark. "But his late work—a little—obscure."

Frankly, Hardy considered, they thought it more than obscure. "Half-cracked," Morlin, his blunt employer had told him on one occasion. But Morlin couldn't get along well without him. Things turned up about the electron reaction rocket. A hint was needed about navigation through the comet disturbed orbits of the asteroids, and no one else could properly set up the orbital calculators in such an unforeseen emergency.

Morlin had to pay him, Hardy thought, and even finance his work on—anticipated potentials—even though Morlin and the scientific world had thought it the delusion of a brilliant mind gone astray after the collision near Jupiter.

Hardy admitted to himself that the days in the abandoned rocket were enough to have driven any one out of his mind. But instead he had thought in terms of equations. He had thought and thought, and scratched formulas on the glossy finish of the ship's imitation woodwork. Instead of madness had come the solution of the problem of anticipated potentials.

He remembered the stir in the scientific world. Yes, they had had to

acknowledge his sanity up to a certain point. The introductory mathematical work was impeccable. But there was a bold intuitive step, and it was because of the result he obtained that they would not credit this. Why, Hardy thought, it is conservative when compared with Einstein's later work. But he alone saw it that way.

SUDDENLY Hardy was conscious of his physical self again. He must have fainted, he thought. Now Rhonda and Dr. Morris were lifting him, and it hurt. Others were there, too, some assisting and some gazing with the awe-struck stupidity of people witnessing an accident. He endeavored to smile at Dr. Morris.

"It's all right," he managed to say. "The evacuated viewing tube fused at the base, and the air pressure drove the electrodes clean through the front of the thing. I guess I got it in the head."

"You did," said the doctor. "Take it easy now, and we'll get you up——"

Hardy did take it easy. He suddenly felt giddy. He was sinking into blackness. Then there was a ringing sound.

Hardy's next recollection was of being in an immaculately white bed. He felt very comfortable save for a sort of stiff sensation at the side of his head. Well, he thought, I'm out of this scrape all right.

At that moment a white-clad nurse entered. She saw he was observing her, and going to the window, raised the shade. Then she turned to him.

"I'm Miss Jenkins," she said.

"The Morlin Company Hospital?" he asked.

"Yes," she replied. "You're really not very badly hurt, though we thought it best not to disturb you. There are some visitors, though."

"Bring them in," he said.

The nurse left the room. As she went he noticed that she was rather pretty, decidedly pretty, in fact. However, as Rhonda entered the room, he realized that she was far better looking than the nurse.

Morlin, Rhonda's father, was there, too. Hardy knew then that he was going to get a real bawling out. He was too valuable company property to endanger his neck by fool experiments. That's what Morlin would tell him. Thank heavens Rhonda had come along! Perhaps she could hold down her father a little. Hardy shuddered in anticipation. Morlin was a person of strong will.

"Hardy," Morlin began, "if those—electrodes had hit you any squarer they'd have bashed in your skull. I hope it'll teach you something. Why can't you leave this damned tinkering to somebody else? You know——"

Hardy put on a look of weary resignation and closed his eyes. He supposed he'd have to face it.

"Dad," said Rhonda, "that's no way to treat a sick man. I thought you were going to be tactful."

"He had to come," she continued, speaking to Hardy. "He was really worried about you."

"Oh, all right," interrupted Morlin, "but you said you'd talk to him. I'll go along if you want. But," he added, "don't forget."

When Morlin had closed the door, Rhonda spoke to Hardy.

"He's right," she said. "You shouldn't waste your time doing dangerous experiments like this. There's too much valuable work you could do for the company. I promised to tell you that," she added.

"Then you don't believe——" he began. "You know that nobody but myself could, or would, carry on this work. And when you, out of Science Institute, promised to help me, I thought——"

"Oh, Hardy, can't you see?" she asked. "It was really to help father. He wanted somebody as your assistant

to help you, to make you see that your ideas were——"

"And I thought that you had some faith in my ideas," he said. "How it could escape you. It's all as simple as high school physics. Any one with a glimmering of sense ought to understand it."

HARDY felt a sort of rage come over him. I'm going into one of my usual tirades, he thought. Well, it'll serve them right. Then he let himself loose.

"You've heard about retarded potentials, haven't you? Any one has. Even radio engineers," he added bitterly, remembering that Morlin had started as a technical man.

"Retarded potentials are used in solving the Lorentz-Maxwell equations," he continued. "It all seems pretty reasonable. The effect of accelerating an electric charge, that effect which we call electromagnetic radiation, or radio, or light, can't be detected at a distant point until some time later. That means we see events after they have happened. What we see is the past, so to speak. That's because electromagnetic waves travel with a finite velocity, they say.

"Light is just the effect caused by accelerating the electron, rushing off at 186,000 miles a second. And the light doesn't get here from the Sun, for instance, until after ten minutes have elapsed, because it takes that long to travel here. So what we see is the Sun of ten minutes ago."

"Yes," said Rhonda, a pained look on her face. She had heard this before.

"Well, it's all wrong," he almost shouted. "It's all wrong. We see the light from the Sun ten minutes after some electron jumps into an atom because Maxwell's equations say we will. Or rather, the Lorentz-Maxwell-Mahler equations. The physical picture people have is all wrong. I don't know myself what the true physical picture is. But there aren't any light waves, as people think of them, that travel through space. That should have gone out with the luminiferous ether," Hardy snorted.

"Even from Maxwell's equations, if a sane mathematician solves them, there's an anticipated potential as well as a retarded potential," he continued. "There's something here to detect ten minutes before the electron jumps into its new orbit just as certain as there's something to detect ten minutes afterward. We call the thing we detect ten minutes afterward light.

"Well, the other thing isn't light. Maxwell's equations are wrong. But it is something, and just as sure as light tells us of the past, it can tell us of the future. Mahler was right, only he didn't know what he had. I know. I've tried to show people. They thought of my theory what they thought of Maxwell's—that it was more ingenious than true. But now"—Hardy pronounced the words slowly—"I've seen this other disturbance. I've seen beforehand what is going to happen.

"Like the Kevin space projection mirrors that we send out, which enable us to see your light waves that left the Earth years ago, I shall see the Earth of the future. I send out a mirror that lets me see my anticipated potential waves that will leave the earth years from now. And, by heavens, it works," said Hardy. "I saw the very accident that laid me out."

He looked at Rhonda triumphantly. Then he was confused. What was the matter. Why, she was crying. So, he thought, she thinks me mad, too. He turned away quickly, lest she observe that he had noticed.

"Why don't you say something?" he asked.

"Oh, Hardy," she said. "Can't you give this idea up—for a while at least? Father's so angry. And I, oh, I can't bear to think——"

Still weeping she got up and left.

Hardy was downright puzzled about this last. She needn't take it so hard, he thought. After all, he was only one of her father's employees, a little more valuable than most, perhaps. But Morlin could get along without him and scarcely feel the loss. Well, he thought with some little satisfaction, that was partly because of the advantage he himself had given Morlin over Morlin's competitors. After all, without the electron reaction rocket——

Hardy had to give up his work on anticipated potentials, at least at the Morlin plant. He couldn't stand the attitude any longer, couldn't face old Morlin out. But, he decided, if he was supposed to be cracked he'd have to show the craftiness of the madman. So he set up his apparatus at his home, and said not a word to any one.

He found it rather difficult to work double time—days at Morlin's plant and nights at home. But he managed rather well by emphasizing his really rather failing health. Morlin was glad enough to have him around for even shorter hours. Rhonda was very helpful. It was strange, Hardy thought, that a woman like Rhonda could be so interested in scientific work, and so talented at that. Why one of these wealthy fellows didn't persuade her to marry him was more than he could see.

Instead she seemed only interested in the laboratory—always willing to learn from him—about anything but anticipated potentials, he reflected. And she was always worried about his physical condition. She had even asked him to cruise on their yacht, to him an unheard of honor.

He had pleaded that he could not leave his work. If they had only known that he meant his private work on anticipated potentials, they wouldn't have been so cordial, he reflected. And wonder of wonders, Rhonda herself had not gone on the cruise, but had stayed to help him in the laboratories.

Hardy found it a hard task to work on the intricate apparatus without the facilities of the Morlin shops. He had plenty of money and machinery, but had never been a particularly skillful machinist or mechanic. He had to learn now. But he had patience and time, and a will to do the task he had set for himself. Gradually he fabricated the apparatus.

Weary weeks were spent plugging leaks in vacuum systems. Weary months followed as he replaced part after part, faulty through his awkwardness. But he rather enjoyed working with his hands so much. And he always had his end in view.

It was a full year and a half after the wreck of his apparatus that it was rebuilt. This time, he flattered himself, it would work better. And on that night, though nervous with anticipation, he carefully checked the pressures with a Macleod gauge, before turning on the switches one by one.

As in the disastrous attempt that seemed so long ago, blobs of green flecked the viewing screen. But this time Hardy confidently turned the sweep control, then the intensity. A wavering scene appeared on the screen. Hardy was exultant, yet impatient. Why couldn't he clarify the image, he wondered? Then he became absorbed in that hazy scene on the screen.

It showed the very room in which he stood. Hardy wondered what time in the future it depicted. He was a little doubtful about the time setting—it had been practically impossible to calculate and calibrate the coils accurately. It couldn't be very far in the future, he reflected, from what he knew approximately.

Anyway, it was his room, and he felt sure it was the future, not the past. There was the machine, represented by a wavering green mass. And there were two people in the room. That showed that it was the future, for no

one but himself had seen the machine as yet. Who could the other be? But the wavering outline gave him no clue.

The two figures seemed to be standing, talking. Then one moved toward the machine. As he did so, the other made as though to follow, then suddenly seemed to fall, to collapse. Doesn't this thing show anything but accidents, thought Hardy? He was intent, interested. And at that moment the bell rang.

There were no servants in Hardy's house save the woman who came in the day to prevent total disorder. She was gone now, so he must answer the bell. He hesitated a moment, then snapped the switch that turned off the machine and hurriedly made his way to the door.

As Hardy opened the door he was in a vexatious mood. He felt a little better when Dr. Morris greeted him. If Hardy had few friends, they were good ones, he thought. Hang the machine anyway, he'd rather see Morris, now that he knew it worked. Besides, he might share the secret of his success——

MORRIS looked a little peaked, he thought, as he brought the bottle and glasses. There was something uneasy about him. He seemed to have something to say, too, beyond the inconsequentialities that would finally open the evening's discussion.

Finally it came out.

"Hardy," the doctor said, "Rhonda seems to be worried about your health."

"I'm all right now," protested Hardy. "You don't see anything wrong with me, do you?"

"You look pretty tired," said the doctor.

"No more than yourself," replied Hardy. "And we'll both feel better with one of these under our belts." He handed the glass to Morris.

"As a matter of fact," Morris continued, taking the proffered glass, "it's more than that. Rhonda has the idea some way that you're working here on your—anticipated potential theory." He looked at Hardy inquiringly.

Hardy said nothing. Both paused for a while, neither wanting to speak. Finally Hardy replied.

"I am," he said.

"I suppose you know what she thinks?" asked the doctor.

"She thinks I'm mad," Hardy replied. "And you?"

"I don't know," was the reply.

Hardy reflected that he did know, or thought he knew. Even one's friends couldn't know everything about one.

"As a matter of fact," said Hardy, "I have the thing working."

He could see that Morris was rather startled. We'd better get it over with now, he thought.

"Come," he said, "I'll show it to you now."

Reluctantly, the doctor rose and followed as Hardy led him to the workshop. He'll soon change his mind, thought Hardy. After all, it's best he should find out that I'm not as mad as he thinks I am.

As they entered the door, Hardy turned to speak to Morris.

"You know the principle of the thing. You're familiar with the Kevin mirror by which we see the past. You really shouldn't be so surprised, you know. This looks a lot like the Kevin mirror, and it acts on much the same principle. I'll turn it on. It takes a few minutes to heat."

He turned toward the machine and reached for the switch. Then a terrible thought seized his mind. This was familiar. He had seen the scene before—it was like seeing a movie twice. Where, he asked himself? Here, a half hour gone! He wheeled about, shouting "Morris" in time to see his friend collapse with an anguished expression on his face. Heart attack, he thought. And this was the man he had seen on

the flickering green screen when he looked into the future, and it was his friend, Morris.

As Hardy bent over Morris, he heard his friend gasp. Then the labored breathing ceased and the man collapsed. Hardy knew that his friend was dead. He was stunned. He could not appreciate the significance of what had happened. But—some way, about the machine there was something that seemed sinister. Twice the machine had prophesied evil, and twice the prophecy had been fulfilled. Hardy was upset He took a drink and called a doctor.

Hardy could not bring himself to work on the machine for a time after his friend's death. And somehow Rhonda's presence comforted him, in the laboratory at the Morlin plant, so he devoted himself more closely to the routine work and let his masterpiece lie idle and unknown.

BUT he could not continue thus, he knew. Always at the back of his mind was the idea that he should, that he must, continue with anticipated potentials. One day he could stand it no longer. When Rhonda Morlin entered the laboratory that morning he detained her before she commenced her part of the day's work on the atomic reaction gun which they were developing.

"Rhonda," he said, "you'll have to carry on this for a while. You know as well as I where we are. I've something special to set up in the next few days."

"Anything so special that it's secret from me?" she asked.

Hardy found himself unable to tell less than the whole truth.

"It's the anticipated potentials," he confessed.

Rhonda did not seem surprised. She was silent, and Hardy could only guess what her thoughts were. He put his hands on her shoulders.

"Look here, Rhonda," he said, "I know you won't believe me, but it does work. I know it. I've been working on it at home. It predicts things," he continued, "and I've seen them come true." He shuddered slightly.

Rhonda continued in her blank expression. Hardy looked into her eyes, but he could see nothing. It infuriated him. She turned to go, and as she did so, he wanted to do—he knew not what. He was terribly disturbed some way, but did not know just how. He had an impulse to run after her—even to strike her. Then he thought that this was certainly an illogical state of mind. So he merely called after her.

"Rhonda," he said, "the least you can do is not to tell your father, now that I have given you my confidence."

Rhonda left the room, making no reply, to enter her laboratory, and Hardy was left to fume inwardly in an entirely unprecedented and unscientific manner. There was but one thing to do, he reflected, and that was to build up the apparatus. Then when Morlin saw it, and Rhonda, perhaps they would understand. He resolved to conquer his inward disturbance by hard work and lots of it.

He found things progressed much faster in the hands of adequate machinists, and that it was a relatively short time before the apparatus neared completion. The new device was a decided improvement over the old, in both construction and scope of operation, for it would detect the anticipated potentials of events to take place not only in its immediate vicinity, but in a surrounding area of several hundred yards, despite intervening barriers. Hardy realized the necessity of having the device complete and foolproof for the first demonstration. When Morlin knew what was up, there would be no second demonstration if the first happened to be unsuccessful.

All the time Hardy saw little of

Rhonda. She kept pretty much to her work on the atomic reaction weapon, and when she was forced to consult him she assumed an impersonal manner which, after their long period of easy association, left Hardy more disturbed than he cared to admit. To the best of his ability he put that out of his mind, and dwelt only in anticipation of the completion of his invention.

It was finally two months after the undertaking of the task that the machine was completed. He continued to busy himself as usual, however, that Rhonda might be deceived, and secretly sought an appointment with Morlin, who had just returned from the conference of planetary monopolies on Mars. He would tell Morlin what to expect, he reflected; actions speak louder than words.

When Morlin stood before the machine, Hardy could not but feel inward misgivings. His two previous experiences with the machine had been enough to try any one's nerve, he reflected. True, his recent trial had brought no calamity; nothing, in fact, beyond blurred—all the images were blurred; he could not understand or correct that—views of the laboratory and himself working there; views which must have been of the future but were so devoid of interest that they were not easily identifiable.

But Hardy knew that the machine functioned and that the views must be of the future. He would have to take a chance on picking up something of interest in Morlin's presence, he reflected.

"It's a new viewing device," he said to Morlin. "I won't explain it fully until after the demonstration, except to say that it enables us to see that which other methods have hitherto been unable to detect."

"I see," said Morlin, "a sort of super X ray, I suppose."

"You might think of it as that," said Hardy, noncommittally. "But wait until you've seen it operate."

MORLIN stood silent while Hardy snapped switches and juggled controls. Finally a blurred green image appeared on the screen. Morlin gazed at it speculatively. It showed, in shifting tones, as of objects seen underwater, a room filled with bulky apparatus. Two figures were present, but they could not be recognized.

"Can't you clear it up?" asked Morlin.

"Not at present," Hardy replied. "But it works, anyway. What does the view look like to you, Morlin?"

"It seems familiar," said Morlin. "By heavens, it's the laboratory, and us in it," he exclaimed. "Surely you don't need this fool machine to see that?"

"You'll notice," said Hardy, "that you aren't standing where you are now, Morlin—whichever of the figures is you. Frankly, they're indistinguishable, but that doesn't matter at this stage."

"The past," said Morlin. "But we have the Kevin mirror," he continued. "It's much better."

"It isn't the past," said Hardy, "watch the scene now."

Then an identifying incident, something of the sort Hardy had hoped for, occurred. In the wavering scene on the viewing screen it could be detected that the door opened, and a light-garbed figure walked through it.

"Who is that?" asked Morlin. "No one has come in since I've been here. It must be a longer time past than that, Hardy."

"Watch what happens," said Hardy, feeling an unreasonable foreboding.

In silence, the two watched. The figures, whoever they were, gesticulated and appeared to be talking. This continued for a few moments, then the third figure left through the laboratory door, apparently slamming it violently.

Something could be seen to fall from the wall of the laboratory.

Hardy breathed a sigh of relief and snapped the machine off. At least, he thought, nothing terrible had happened this time. And he had an incident that even Morlin should be able to identify.

"What now?" asked Morlin.

"You'll have to wait a moment," said Hardy. "I'm going to adjust the machine properly."

Morlin stood idly by while Hardy fiddled with the machine to gain time. That his actions might not seem too purposeless, Hardy actually did make an adjustment, one that would enable him to see the street entrance of the Morlin Laboratories rather than his room on the top floor. Then the prophesied incident occurred.

Some one knocked at the door.

"Come in," said Hardy.

Rhonda, dressed in a light laboratory smock, entered, with a sheaf of calculations in her hand. She looked at Morlin, then at Hardy, and then turned as if to go.

"What's the matter, Rhonda?" asked Morlin. "It's just a demonstration; you can watch, too."

"I'd rather not," said Rhonda. "I'm pretty busy with my work."

"Look here, Rhonda," said Hardy, "don't act like that."

"Why not?" she asked.

Again the unreasoning anger seized Hardy. He forgot about the machine, about everything but Rhonda. But he wouldn't let it come out. He froze it inside of himself.

"Because I don't like it," he said, as icily and ridiculously as any one could.

"What are you two quarreling about, anyway?" asked Morlin, in bewildered puzzlement.

THE QUESTION was to remain unanswered, however. Rhonda suddenly seemed to tremble. Her face took on a tight look.

"I'm going home," she announced curtly. She turned and walked rapidly through the door, slamming it after her. As the door closed Hardy's framed photograph of Gustav Mahler of the Lorentz-Maxwell-Mahler equations fell from the wall with a crash.

The shock brought the scene on the screen to Hardy's mind. Forgetting everything else for the moment, he spoke to Morlin.

"That scene," he said, "and the picture falling; did you recognize it?"

"Just temper," said Morlin. "I wonder what she's got into her head now. You two must have been quarreling."

"No," said Hardy, "I didn't mean that. I meant, that's the scene you saw on the screen, by anticipated potentials. You were looking at the future, and that was it."

Morlin looked at him incredulously.

"You mean?" he said. Then, "It's absurd!"

But Morlin's voice was half believing. Hardy quickly turned on the machine, as he had readjusted it.

"It isn't absurd," he said. "You saw it for yourself. Watch, now. I've adjusted it to show the front of the building. We'll see it from here, and then go down and check up on what happens."

Morlin and Hardy gazed tensely as a flickering green image took form on the screen. There was no doubt about it; it was a street scene. There was a tall building which might well have been the Morlin Laboratories. Through the street whirled the miscellaneous vehicular traffic of the city. That was all, for the moment. Then, before the two men's eyes, took place that which made Hardy cold with fear.

Out of the door of the building hurried a figure, and started rapidly across the street, as though oblivious to the speeding motors. Two figures ran after

the first, emerging from the door as the other left the curb.

Hardy and Morlin could see the first one to emerge glance around, as if cognizant of a warning, or else observing for the first time the traffic surrounding it. One of the other figures rushed out toward that one. Then a car seemed to bear down out of the corner of the picture. The rushing figure reached the first; the car seemed to cover them; one was thrown free. Then the screen went blank.

Morlin stared at the blank screen in bewilderment.

"What does it mean?" he asked.

"A connection——" commenced Hardy.

Then in a flash of prescience, he took the scene in.

"Rhonda," he gasped. "Perhaps—perhaps——"

He rushed to the elevator, followed by Morlin.

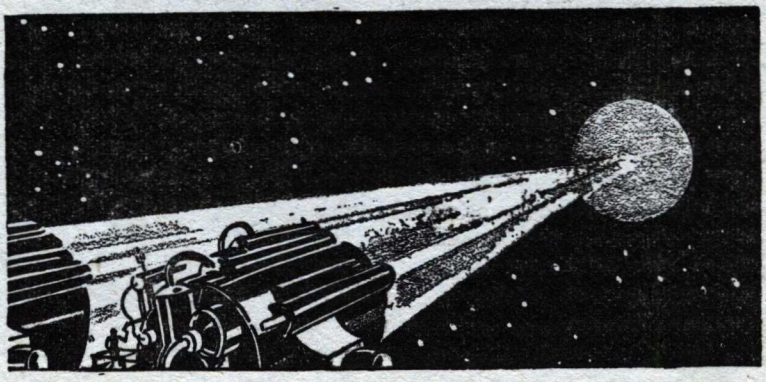
As Morlin and Hardy reached the street, the scene lay before them. The bewildering traffic was there, and hurrying into the street, the figure of Rhonda, and the unseen car bearing down upon her.

Hardy knew what to expect. If only, it flashed into his mind, if only the figure flung free might be Rhonda, and he be the one under the wheels of the car. Almost quicker than thought he had reached her. He pushed her from him, then glanced to his left. The car seemed to hang in the air before him, enormous. Then it suddenly struck. There was a numbing blow, and blackness.

When Hardy regained consciousness at the hospital, everything seemed very quiet. He was tired, but not, it seemed, in pain. Or perhaps, he thought, he was drugged, and would feel the pain later. But his mind was very clear.

Rhonda and Morlin were there, Rhonda at his side. She seemed very beautiful. Then he knew why she had wept at the hospital, why she had later been curt to him, but had still stayed with him as his assistant. And he knew why he had been angry with her, and wanted to strike her. All was so clear to him now. It was because she had loved him, and because he had loved her.

Then there was the machine. Was Morlin convinced, now, he wondered? And was the machine a thing of evil, that it prophesied only ill? Fantastic thought. But he did not greatly care. That he would know later.



The Drums

An I. S. P. Story

by Clifton B. Kruse

Green bodies writhed; rigid tentacles vibrated agony, shrill, unhuman——

HIS squat, apelike body swaying about the ship's kitchenette and the brier-stiff strands of his grayish beard vibrating to the strenuous workings of his jaw, old Max Durr chanted the count as he dropped the pulpy sunberry beans into the boiling pot of water.

"Eighteen and nineteen and twenty and boil," he sang out as he plopped the lid upon the pot. "But ganders, 'tis the last full pot of sunberry that we'll be drinking this trip—do you hear me, Don Kelz? I'm saying that there're but twelve sunberry beans left."

There was a glint of anxiety in the old spaceman's eyes as he peered up through the aperture at one end of the kitchenette. For three Earth days now the tiny, wasp-shaped patrol ship, B28, had hovered secretly upon the smooth iron plains of the satellite, Mimas.

For much of the time the tall, steel-muscled young officer of the ship, Captain Don Kelz of the Interplanetary Secret Police, had remained close to his recording instruments in the foredeck above the living quarters.

In that time the massive beauty of the planet Saturn, a scant thirty thousand miles from Mimas, had turned upon her axis six times. Anxiously, even tensely, Don Kelz of the I S P had studied the cold, dark surface of the planet with infra-red refractor, special ray detector and numerous other devices of observation used almost exclusively by the I S P.

"Max Durr, I swear you flutter about with more to-do than an old woman." Don Kelz's long legs dangled through the port. Nevertheless, as he dropped to the floor and swung his lank body into a chair, there was a grin upon the firm mouth.

Max Durr busied himself with the steaming pot. He grumbled thickly as he toiled. "But for three Earth days already are we here whilst in the canister——"

"—are twelve beans." Don Kelz roared out in laughter. But there was a meaningful note in the relaxation of his booming voice. The old spaceman turned from his brewing, his grayish eyes squinting sharply.

"The job is done, you mean?"

"Done? What do you think this is, Max Durr? A data-picking expedition from the Smithsonian? Listen, man—it's a tradition in the I S P that a job's not rightly what you'd call a job till there's been a scrap—and by the sacred fires of Andromida, Max Durr, we're headed for man-sized trouble."

For a moment the old blaster held to the steady gaze of the young captain. Then he grinned. His squat body swayed as a long arm reached for the canister. With ritualistic ardor the old man plopped the twelve remaining sunberry beans into the pot.

"We'll make her bitter and black, Don Kelz—and blast your shivering soul to Hades if the fight doesn't show up, for 'tis a fighting man's cup that I be brewing this time."

The clock upon the wall, ridiculously marking off the almost meaningless Earth hours, had measured fifty minutes when Don Kelz shoved back his empty cup and arose.

"Make ready in the engine room," he ordered. "We blast from Mimas in exactly ten minutes."

A single spurt of flame from her space-mounting torps was sufficient to send the tiny ship falling toward the malefic blue-green of Saturn. The B-type patrol ships, smallest and speediest of all Earth's transports, were particularly designed for the highly specialized investigations of the Interplanetary Secret Police. Their coloring and lightninglike swiftness made them virtually invisible to watching observatories.

Don Kelz's command cut through the ship's phones with unusual vigor. "Cut the power. Shut all power tubes."

"Power off, sir."

"Set momentum stabilizer at zero."

"Stabilizer set."

"All right, Durr—get your space suit in order—wait for me in the underdeck."

DON KELZ burst hurriedly into the deck. From the space cap the officer's eyes burned with dark brilliance. Beneath one arm he bore a peculiarly strapped bundle, at sight of which Max Durr sucked in his breath sharply.

Without a word of explanation Don Kelz placed the curious bundle so that one end of it rested upon the chest of each of them. As swiftly as he could with the pronged hooks of his space suit he adjusted the straps of the bundle to the belts of the space suits.

The radiophones rang with the sound of his voice.

"All ready, Max Durr?"

The old spaceman nodded vigorously, reached out so that the grappling hooks of his right hand momentarily locked with those of the officer.

Don Kelz's hand held one end of a taut strand of wire. "One, two, three," he counted and jerked.

A sibilant screech of fiercely spouting air shot their monstrous bodies through the jet. From the hull of the silently speeding transport the two interlocked spacemen were ejected, swirling in stiffened spirals. Straight toward the strange blue-green mass which completely filled the sky the unmanned ship sped, its velocity increasing as the gravity of Saturn pulled with constantly increasing force.

Far behind the tiny ship the whirling bodies of the two men fell toward the planet. Saturn was down now. Faster and faster their bodies hurtled through the sinister blackness of space.

Don Kelz made no attempt to see. The universe had become suddenly mad. He seemed to be standing motionless, his body strangely freed of any gravitational force while all about him was the ominous bulk of the planet; the dark, star-studded sky spiraled in a sickening flash of alternating starlight and planet darkness. Resolutely he closed his eyes.

With timed precision he counted from one to sixty until the count had been made for every finger on each hand. Then, swiftly, he yanked the catch upon the strapped bundle between himself and the courageously silent old spaceman. As if by magic the straps uncoiled. Now gently, almost as a cloud rises, the bundle opened up and a vast expanse of silken black cloth arose slowly.

Don Kelz breathed deeply though his eyes held to the steady unfolding of the black fabric. He had estimated correctly. They were at the outermost edge of the planet's sphere of air. A sudden tension upon the straps was followed by a rigid stiffening of the fabric above them. The whirling ceased. There came a distinct sense of falling. Straps from the bulky space suits became taut, and high above them the black fabric bulged with air.

Down, down, down for mile after mile. Queer pains cramped their vitals and a drunken giddiness caused brains to tingle and eyes to see fantastic shapes in the strata of cloud mists. Only the ruthless discipline of spacemanship enabled the officer to keep his bearings in the awful hours of constant falling. Above him the gigantic parachute bulged and swayed in the shifting winds of the changing strata of air. Now and again the men would grasp a certain strap and swing together with timed momentum as they steered the cumbersome contraption.

Max Durr had regained something of normal breathing to call out: "We land in the dead of night—but where?"

Studying the hazy outline of the planet's surface Don Kelz's words came in crisp spurts: "Must hit—plateau north and west—of the Dolomahndi country—think I figured it right."

Far to their right the rainbowlike ribbon of Saturn's rings reflected their weird blue-green light over the night side of the planet. The yellowish glow of no less than four of Saturn's nine moons cast their radiance in intermingling bands of light.

"We're nearly there—all set, Max Durr!"

"Set I be," came the muttered response.

The impact of their fall sent a yellow-gray cloud of fine dust into the air. For several moments the gigantic parachute stood on end like a great sail. Max Durr tensed his body prone to the porous rock ground as Don Kelz pulled at the straps.

" 'Tis not long till dawn," said the old spaceman, springing up to assist in the refolding of the black fabric, "and dead-

ening cold. But I don't know this place, sir, though I've set foot in both the outpost cities here on Saturn."

BOTH MEN straightened up to stare about them. In every direction the seemingly interminable plateau extended in a barren, unbroken plain of porous, gray stone. Although the Sun had not yet risen the weird confusion of light from the several moons as well as the scintillating blue-green reflections from the gorgeous ring made of night a ghostly twilight. Consulting his compass Don Kelz finally lined his course.

"We must hurry—there's an hour yet till sunup—and we must reach the Dolomahndi Valley. Roughly, we're about three thousand miles west and south of port city, Advance. You know the place?"

"Been there—once—two years ago. Not much of a place—two hundred humans and most of them African blacks—and about a thousand Plutonian scaly beasts. Ganders, 'tis no city—just a mass of pens for the scaly beasts, and granary bins."

The low, almost ruminative tones of the officer were droned out in cadence, as his long legs clicked a steady pace. "That's it—fact is, there are only four white men there. The council's virtually consigned this side of Saturn to the blacks. There's something about the planet which eventually gets to a white man—but the blacks—after they're properly space-hardened—seem to thrive. As a matter of fact, Max, the council lists well over a thousand of them in Advance City and throughout the Deep River Valley."

Max Durr ran forward a few steps, stopped, caught a few good breaths. "Look here, Don Kelz. By the glory of the triple sun I swear that there's devilment afoot that you're selfishly keeping to yourself. If this be not an expedition of exploration, then, by glory——"

"Hurry it, Max." Don Kelz continued his maddening pace. "We've got to make the valley before sunup. Sure, there's trouble—at least the council's afraid so—because in the last five years over four million blacks have vanished from the Earth—and the department of interplanetary travel records less than twelve thousand which have ever been listed as either spacemen or passengers upon all classifications of transports."

The old spaceman trotted complacently behind the lanky secret agent now.

"We're here," Don Kelz called out sharply and swung down a jagged incline. The table-smooth plateau ended abruptly. Before them now the ground cut downward sharply into a sea of clouds. Far below those clouds lay a richly fertile valley, warmed by emanations from the planet itself. Strange, hardy growths made the deep-cut valleys of Saturn veritable hotbeds of lush vegetation despite the eternal dusk.

NOT UNTIL their progress down the steep slope had become a blind groping in the fog did Don Kelz signal a halt. He had found a small cavern. The two spacemen crawled in and lay upon the rocky floor for a moment of needed rest.

Don Kelz had removed his space suit. For several moments his breathing came in sharp, coughing gasps as his lungs became adjusted to the peculiar tang of the valley atmosphere. Soon he secured a square of oiled paper and with the aid of several small instruments from a leather-bound case began to lay out a map of their position.

"Our position is here. The B28 was set to fall approximately a thousand miles due north—so we're safe from detection—and that's of greatest importance. Now the Dolomahndi Valley lies here. It's a vast oval—a hundred miles long and twenty to forty in width—and at the east end joins the Deep River Valley—half of which is under supervised cultivation."

Max Durr rubbed his head slowly as he frowned at the map.

"Then why didn't we just land at Advance—and then go ahead and make investigations. Say—is my head screwy? I keep hearing things—like thunder a long way off or something?"

Don Kelz paused to listen, shook his head, frowned perplexedly.

"It might be a storm below us—we're still a couple of thousand feet above the valley level—but your first question. Frankly, our orders are to go and find out—we are to take no man's word for anything. The service headquarters wants facts—and wants them before they're disguised or covered up. That's one of the reasons why there is an I S P. However we had better——"

The old spaceman crawled to the ledge and peered down into the mass of clouds, cupping his hands to his ears and listening intently.

"I keep hearing it—*boom, boom, boom geboom*—over and over again. 'Tis no storm—hear it? *Boom, boom, boom geboom*—like a forest drum—beating out signals, it is."

Don Kelz, too, was listening. "Up there on Mimas the instruments recorded the presence of many human bodies. Their massed bodily emanations affected the ray detector especially—but I couldn't localize it—except that it was from the presumably uninhabited Dolomahndi Valley."

"I see now," Max Durr muttered softly, "why you risked wrecking the B28—and why you were in such a rush to get off the plateau—we'd been in plain sight up there. But listen—it's getting louder."

Freed of their cumbersome space suits the two men tackled the precarious descent. Don Kelz had marked the cave where the suits as well as the bundled parachute lay hidden. Upon their backs each carried the usual explorer's pack. Ominous, dagger-shaped heat guns were strapped to their belts. For fully a quarter of a mile the dense clouds shrouded them. Then, suddenly, the mist cleared. A long, grassy slope led down to a forest mass of thick, fungoid vegetation. The feeble light of the distant Sun caused the clouds seemingly to emanate a soft, phosphorescent glow. The rasping chirps of valley imps, pulpous, cricketlike things which grew to the size of frogs, made a weird din in this solemn world.

"But I can still hear it," Max Durr muttered, his gray eyes beading as he sought to see into the forest of vegetation. "It's never stopped. Ganders, the blessed boom, booming is pounding my blood into bubbles. What is it, Don Kelz? What is it?"

Receiving no reply the old spaceman jerked around apprehensively. Don Kelz was not in sight. For a moment old Max Durr stiffened as clutching chills tingled his spine. Then, viciously, right hand swinging a heat gun before him in instant readiness, he ran swiftly along the solid wall of thick, pulpy stalks. As close together as though they had been built into a wall grew these hardy, grain-bearing plants.

Max Durr's eyes stabbed from beneath the shaggy folds of tensed brows. For a distance of fifty yards he skirted the edge of the forest. There was no evidence of a break in the vegetation. Now he returned, moving slowly and cautiously this time.

A fist clopped heavily down upon his shoulder: "There you are, Max Durr. Where'd you run to?"

"Don Kelz!" The old fellow moaned. "'Tis you that was lost. Where——"

"Over this way, Max. I found a path."

"But there's nary a break."

"No? That's because you depended upon intuition rather than observation."

Max Durr grimaced sourly: "Who, me? I depend on nothing but the hardness of my fists and the hotness of my gun."

"But look there—see that curious ledge—like a well-worn path leading up from the valley? Now follow it across the slope—see it, Max? It leads directly to the wall of vegetation. Now watch!"

QUICKLY Don Kelz reached the designated spot. Thrusting one arm into the wall he parted the stalks. Beyond, almost tunnellike in its narrow, twisting way, there extended a path through the dank growth. Max Durr speedily followed. Together they filed along the path. The ground was soft and the close air steaming hot. Perspiration streamed down their faces, soaked their clothing. Their breathing came in short, quickened gasps. The mellow odor of sodden plant growths was strong. And still the malefic insistance of the primeval cadence of the drums beat with fearful monotony into their ears.

Once Max Durr had reached ahead to grasp the younger man's arm. "'Tis not a natural sound Don Kelz—I'm warning you—'tis an evil omen—nowhere in all the universe have I——"

"Quiet, Max."

Don Kelz's voice was low. His narrowed eyes gleamed darkly and the barest suggestion of a grin showed at the corners of his hard mouth. They crept forward slowly, rounding each turn of the path more cautiously. Abruptly, Don Kelz halted. The old spaceman crouched at his back.

Beyond the next turn the path opened into a clearing. Upon all four sides of the closely cropped glade the forest of stalks walled it into the semblance of a room. But it was the huddled group at the far end which caught their eyes.

Black, sweat-glistening bodies stood with oxenlike patience, and with heads down. About the waist of each was fastened a wide leather belt to which interlinking chains were attached.

"Earthmen!" Max Durr breathed awedly. "But where——"

Suddenly the stalk wall parted. Into the clearing and straight toward the cringing blacks strode a tall, green-bodied thing. Its legs and long, muscular trunk were remotely human, yet from the wide shoulders there extended four long tentacle arms which it thrashed and cracked in the air. Immediately the chain of black slaves trotted forward and disappeared through the break in the wall. For a moment the green monster paused to glare about the clearing. Two, deep-set and dark-red eyes gleamed from the pointed head. Apparently satisfied the creature disappeared after the line of blacks.

"What—what is it? Great Polaris—I never—never did see——"

Don Kelz reached back a restraining hand to the trembling, teeth-chattering old spaceman.

"A gnoll—but keep down, Max. Sacred nebulae—truly that is one of them—the first one alive I've ever seen."

"Gnoll?" Max Durr pressed closer to the officer. "You mean—that green monster—that was a real gnoll?"

Don Kelz nodded sharply. "One of the original inhabitants of the planet. They resisted every effort of the Earth men to land upon Saturn—and they were wonderfully intelligent in a devilish sort of way. After the holocaust—when Wiljon Kar and his fellow engineers blasted them with reflections of pure atomic discharges—their cities were completely destroyed—and it was believed that after the purging expedition had completed their work that the gnolls had been entirely exterminated. But now—come—move quietly and be quick—we're going after them."

Don Kelz sprinted across the clearing, his eyes fixed upon the point at which the gnoll and the line of slaves had left. Behind him, gun hand still ready, came Max Durr, his bristly chin jutted forward in determination. They were glid-

ing swiftly yet noiselessly down another pathway now. It seemed more like a hall than a trail, however, and was wide enough for two men to walk abreast. At frequent intervals the path opened to small grassy clearings. Each time the alert, supersensitive eyes of the secret-service agent found the point in the wall beyond where the pathway continued.

"We've gone a mile already," Max Durr panted.

Don Kelz nodded. "Notice anything else? No? What about the drumming?"

Max Durr's jaws gapped. "Glory to Pluto. I'd clean forgot. It's no longer thumping out its hell-raising tune."

"And we've seen not a sign of any more slaves."

"Or those damned gnolls," the old spaceman uttered softly.

"But the paths—and those peculiar glades are getting wider and more frequent—keep that in mind, Max, and get this: Our mission is to discover and report!"

IT WAS HIGH NOON when they reached the shallow rivulet, a murky, bubbling stream of water. The peculiar stench of rotting vegetation gave the air an almost choking tang. The close-cropped grass had been flattened by many feet. At the very edge the soft ground showed the intermingling prints of broad Earth-born feet and the triangular prints of the padded hoofs of the gnolls. Across the rivulet extended a field of waist-high grass with here and there the dark masses of huddled groups of the strange fern-leaved trees of the valleys of Saturn.

In the grayish light from the cloud-burdened sky the scene was strikingly vivid. Everything was ominously still. Wind was a force unknown in the deep valleys. Only the nerve-rasping twittering of the pulpous, overfed bodies of the several pollenizing insects disturbed the oppressive silence. Nevertheless the two Earth men forded the stream with exaggeratel caution, moving quickly to the nearest clump of fern trees with bodies hunched so that they might not be sighted above the tops of the tall grass.

The sight of the curious, rounded structure beyond the trees caused them to crouch expectantly in the shielding shrubbery. From a distance it seemed more an unusual outcropping of the strange, porous stone so abundant over all the planet. Nevertheless there was definite alignment in the placing of the stones, with the dark aperture of its doorway nearly concealed by the tall grass.

Suddenly a figure emerged from the opposite direction, moving with reptilian grace. Behind it came three others—tall and green and with their four tentacle arms wrapped characteristically about their smooth, muscular trunks. The gnolls entered the stone building. The sudden *clamp, clamp, clamp* of bare feet shocked the two observers into a still-deeper hiding.

Coming down toward the rivulet, fording the stream now, was a long line of blacks. They filed with sheeplike patience, their interlocking chains holding them to a long, snaky line. At the head of the line strode a tall, green-bodied gnoll. There were fully a hundred blacks in the chain gang. At intervals, there walked beside them the slave-driving gnolls, their tentacles waving whip fashion above the peaked heads. The slaves were moved across the clearing and beyond the building, disappearing in the murky distance beyond.

The face of Don Kelz was rigidly harsh and his eyes gleamed with narrowed bitterness. His fingers tightened upon the older man's shoulder. His voice, as he spoke, cut with whiplash sharpness. "Max Durr, wait here—one Earth hour by your watch. If I do not

return—then you are to get back—keep to the cave—and when the time comes—meet the patrol ship. Do you understand?"

The old man nodded slowly. Bitterness lined his face. The grip of his hard fist as he clasped hands with Don Kelz spoke more clearly than words of the firmness of his stout heart. Earth men were not born to be slaves. Whether they be black or white, red or yellow the sons of the planet Earth must be free men. Without another word Don Kelz glided into the tall grass, his taut muscles and tense nerves causing him to move with pantherish agility. Max Durr crouched more deeply into the shrubbery. For a moment only could his eyes follow the younger man's swift, noiseless departure.

Not a sound escaped the dark opening of the strange building, though Don Kelz listened intently. Moments dragged torturously as he crouched down to the ground. Then the soft plod of cushioned hoofs caused his nerves to tingle. Another gnoll was approaching the building. It stooped to enter the dark opening. As close and as silent as a shadow, Don Kelz was at the back of the hideous green body. Even as the thing bent down to enter Don Kelz plunged the long-bladed knife and shot into the opening with the fall of the body.

SCARCELY daring to breathe, the Earth man hovered against a wall. The place was dark. Only the dying gasp of the gnoll broke the heavy silence. Don Kelz counted the minutes. Nothing happened. Eyes alert for any movement in the ominous darkness, he grasped the dead gnoll's body, dragging it away from the opening. He stood poised with ears attuned for the slightest sound. Daringly now he grasped a glow torch, pressed the stud. In the momentary flash his mind held the picture of the room: barren and empty but with a dark tunnelway at the side opposite the doorway.

Don Kelz was across the room; his groping feet found the tunnel. A winding ramp spiraled down into the porous rock, fifty feet—a hundred. Abruptly a turn opened to a long cavern, dimly illuminated by the single, bulk-shaped torch suspended from a ceiling, so low that the tall gnolls must surely walk with heads bent forward.

A quarter of an hour's stealthy shadowing down the winding ramp brought him to the vast underground chamber. In ages past as the strange planet cooled, its peculiarly porous rock must have formed this cavern as a pocket of gas. Almost a perfect circle and approximately a mile in diameter, the place had been built into a gigantic barracks and assembly hall by the gnolls, as they fled to this valley from the conquering blasts of the Earth men.

The walls were ridged with smooth ramps and dotted with porthole openings which were apparently the living quarters of the green-bodied monsters of Saturn. Here and there a slick green hide reflected the misty light of the hundreds of glow torches as the gnolls moved about. Far below upon the floor of the cavern a hundred or more of the gnolls were seated about the central dais.

Even as he stared Don Kelz observed a quickened tension among the weird creatures. As if by signal the ramp suddenly filled. The floor below became solid with convening thousands. Abruptly a score of the gnolls leaped to the dais. It was then that Don Keltz observed the odd contraption there, for suddenly the gnolls began to beat upon the dull gray thing stretched across the dais.

The thunder of the massive drum caused his flesh to quiver. The gnolls swayed in unison to the wild ferocity of the nerve-tingling thumping. Something had happened. The quivering tentacles

of the excited gnolls indicated unusual concern.

The cadence stopped with shocking abruptness. The drummers poised with clubs in mid-air. Every head turned to face the large aperture to one side of the hall. Now the drumming began again, beating a steady, quick tempo. Into the great hall and straight toward the dais there marched a squad of gnolls.

Don Kelz leaned forward, eyes widened in horror. Two of the gnolls bore in their upraised tentacles the body of a white Earth man. A strange, fearful stirring surged through the assembly.

For a moment Don Kelz could not see for the stinging tears beclouding his eyes. Bitterness burned hotly in his veins. It was Max Durr whom they had captured. Now they stood him upon his feet. Two of the gnolls, evidently leaders of the clan, faced him. Tentacles gestured before the old spaceman's eyes. Don Kelz understood the meaning of this. The gnolls were vainly endeavoring to question the captive, seeming not to realize that the sibilant vibrations of the tips of the tentacles conveyed no intelligible meaning to the white Earth man.

Suddenly one of them hastened to the monstrous drum, grasped the club of a motionless beater and began a strange tapping upon the taut membrane. Still the old spaceman remained stiffly erect and silent. The gnoll beat with renewed vigor, turning to gesture toward Max Durr. As if stung by the old man's determined silence the gnoll ran swiftly toward him, club upraised. Viciously the thing crashed the club down upon Max Durr's head.

It was cowardly. The old man had no chance to escape the blow for the gnolls upon each side of him held his body as if it were strung there upon eight steel cables. Max Durr had sagged, the grizzled old head slumping forward upon his chest. The gnoll swung the drum club again.

Fierce energy drove the watching Earth man's muscles to abnormal strength. Don Kelz charged from the dark hallway, leaped from the ramp to the one just beneath. His feet struck firmly only to spring again. From ledge to ledge down the gradual slope of the bowl his body dropped with reckless skill. Not until he had come to an abrupt halt upon the lowermost ledge was he conscious of the shock-stiffened stares of the multitude.

It was Max Durr's rasping cry which broke the spell. "Don Kelz—run—don't get caught—get back to the cave!"

THE GNOLLS surged in a green wave of malevolent hate. Yet even as the tension broke Don Kelz had braced his back against the stone of the wall. In each hand a dagger-pointed heat gun seared a streak of livid death.

Swiftness of attack and the mad fearlessness of his fighting were the only tactics. The lash of the twin beams of death cut with ruthless persistence. Green bodies writhed, rigid tentacles vibrated agony too shrill for human ears.

"Don Kelz! Don Kelz! Work around this way! Keep your back to the wall!"

The courage of the old spaceman's ringing voice brought a fierce grin to the younger man's tightly drawn lips. Desperately now he swathed a path to the right, clicked off the power for a hurried dash, stopped to back against the wall and blast quick, searing death again. Another swath. Again the frantic run. His tactics bewildered the milling, tentacle-waving mob.

Now a flailing, madly scrambling figure beat his way through the surging green bodies. Max Durr had gained the ledge, reached the side of his leader. His old hands grasped Don Kelz's shoulder in mute fellowship. Wordlessly he accepted the glowing heat gun.

"The main hall—quick!"

None too soon did the flashing, death-spitting bodies of the two Earth men disappear in the maw of the huge tunnel. In their ears reverberated the thunderous cadence of the great drum. As if by magic the gnolls fell back, assembling themselves in military order.

Max Durr led the way, his breath coming in agonized gasps as he ran. Steadily up through cavern after cavern they hastened. At frequent intervals the two Earth men halted, crouching in the darkness of a narrow tunnel as a hurrying squad of searching gnolls padded into view, tentacles aloft and tense. Time stretched to torturous hours. The older man was weakening. Then a grayish glow of light seemed to burst upon them as they rounded a dark turn.

"This is the way," old Max gasped as he spoke. "I remember it. It's another one of those crazy ant-hill houses. I ran smack into it on my way back. It's near the edge where we first came in. I got mixed up and followed the wrong path—but we're near the edge of the valley—not more than a half mile from the cave where——"

The sudden burst of drumming hammered the old man into silence. Don Kelz hastened to the doorway of the cave entrance, peered beyond to the glade. A sharp gasp escaped clenched teeth. A solid ring of blacks faced the entrance. The slaves quavered, their eyes rolling in mute terror. Behind them were massed the gnolls, tentacles lashing as they forced the slaves to close in upon the entrance.

"Trapped!" The exclamation was a moan of despair.

"No! By ganders—we won't give up." There was a strange ring to Max Durr's voice. Before Don Kelz realized what he was doing the old man had gripped his heat gun.

"Black men!" he screeched. "Charge! Kill the green beasts—tear them apart—kill! Kill! Kill!"

Even as he yelled the blood-curdling commands, Max Durr dashed from the cave. In a running leap he hurtled the confused line, ran with a terrific output of energy.

The blacks staggered in confusion. They saw the screeching devil leap over their line, saw his gun spit sure death to the green slave drivers. They caught the fierce blood lust of the white man's charge. Blindly, crazed by the new emotion, they staggered in awkward confusion.

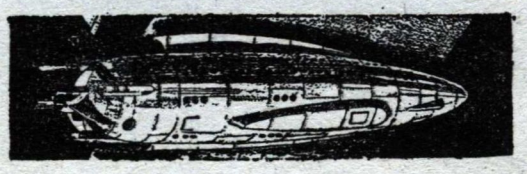
The ruse worked. Scarcely were the startled gnolls aware of the fearless maneuver than the two white devils from Earth were beyond them. They could not give chase for the suddenly half-crazed line of slaves were upon them, clawing, biting, seeking to kill.

Not until they had reached the cave and gathered up their bulky space suits with breathless haste did the two panting, sweating Earth men exchange a word.

"Good work, Max—bless your crazy soul—but hurry—to the plateau—in another hour the patrol ship is due. We can make it!"

Max Durr staggered into his suit. He was grinning and gasping for air.

"'Twas a great scrap—Don Kelz, you bloodthirsty son of Hell! But as soon as we report—ganders, we're gonna nave a real fight."



At the Mountains of Madness

Part Two

by H. P. Lovecraft

The effect of the monstrous sight was indescribable! Some fiendish violation of natural law!

UP TO NOW:

A geologist, leader of the Miskatonic University Expedition into the antarctic in search of deep-level specimens of rock and soil, relates for the first time the strange and terrible experiences and discoveries of the expedition, in the hope that the Starkweather-Moore Expedition which is about to take off on the same venture, will give up the idea as too terrifying and horrible to undertake.

The group, composed of a geologist; Pabodie, the inventor of a superior drill which makes it possible to unearth rock specimens; Lake, a biologist; and sixteen assistants; cross the Ross Sea in the antarctic, ascend Mt. Erebus, fly over

the South Pole, and finally discover a mountain range larger than any known in the world.

At Beardmore Glacier, a region of the highest importance to the knowledge of the world's past, they find a variety of upper fossiliferous rocks over 500 years old. The new mountain range yields specimens thirty million years old, proving that the earth has seen cycles of organic life before the known one that begins with the Archaeozia cells.

Since the Expedition is divided into two exploring parties, Lake being in command of the one nearest the strange mountains, the geologist hears of the discovery of these strange specimens by radio. Lake reports also the unearthing of a peculiar kind of soapstone with a particularly malignant odor prevalent throughout the mountains.

When a storm comes up and the geologist hears no more from Lake, he sets out with his party to the rescue. Reaching the camp he finds the bodies of the men and dogs contorted in unnatural death—a death seemingly from strangulation or laceration. The six imperfect carnivorous monstrosities are carefully buried upright in a nine-foot snow grave under nine-foot mounds punched over with groups of dots in pattern like those on the queer greenish soapstones dug up from Mesozoic and Tertiary times. The eight perfect specimens mentioned by Lake, have disappeared completely.

The geologist and remaining number of the company return to civilization, flying over the tremendous heights of the strange mountains toward the sea.

PART II.

IV.

IT IS only with vast hesitancy and repugnance that I let my mind go back to Lake's camp and what we really found there—and to that other thing beyond the awful mountain wall.

I have told of the wind-ravaged terrain, the damaged shelters, the disarranged machinery, the varied uneasiness of our dogs, the missing sledges and other items, the deaths of men and dogs, the absence of Gedney, and the six insanely buried biological specimens, strangely sound in texture for all their structural injuries, from a world forty million years dead. I do not recall whether I mentioned that upon checking up the canine bodies we found one dog missing. We did not think much about that till later—indeed, only Danforth and I have thought of it at all.

The principal things I have been keeping back relate to the bodies, and to certain subtle points which may or may not lend a hideous and incredible kind of rationale to the apparent chaos.

At the time, I tried to keep the men's minds off those points; for it was so much simpler—so much more normal—to lay everything to an outbreak of madness on the part of some of Lake's party. From the look of things, that demon mountain wind must have been enough to drive any man mad in the midst of this center of all earthly mystery and desolation.

The crowning abnormality, of course, was the condition of the bodies—men and dogs alike. They had all been in some terrible kind of conflict, and were torn and mangled in fiendish and altogether inexplicable ways. Death, so far as we could judge, had in each case come from strangulation or laceration.

The dogs had evidently started the trouble, for the state of their ill-built corral bore witness to its forcible breakage from within. It had been set some distance from the camp because of the hatred of the animals for those hellish archæan organisms, but the precaution seemed to have been taken in vain. When left alone in that monstrous wind, behind flimsy walls of insufficient height, they must have stampeded—whether from the wind itself, or from

some subtle, increasing odor emitted by the nightmare specimens, one could not say.

BUT whatever had happened, it was hideous and revolting enough. Perhaps I had better put squeamishness aside and tell the worst at last—though with a categorical statement of opinion, based on the first-hand observations and most rigid deductions of both Danforth and myself, that the then missing Gedney was in no way responsible for the loathsome horrors we found.

I have said that the bodies were frightfully mangled. Now I must add that some were incised and subtracted from in the most curious, cold-blooded, and inhuman fashion. It was the same with dogs and men. All the healthier, fatter bodies, quadrupedal or bipedal, had had their most solid masses of tissue cut out and removed, as by a careful butcher; and around them was a strange sprinkling of salt—taken from the ravaged provision chests on the planes—which conjured up the most horrible associations.

The thing had occurred in one of the crude aëroplane shelters from which the plane had been dragged out, and subsequent winds had effaced all tracks which could have supplied any plausible theory. Scattered bits of clothing, roughly slashed from the human incision subjects, hinted no clues.

It is useless to bring up the half impression of certain faint snow prints in one shielded corner of the ruined inclosure—because that impression did not concern human prints at all, but was clearly mixed up with all the talk of fossil prints which poor Lake had been giving throughout the preceding weeks. One had to be careful of one's imagination in the lee of those overshadowing mountains of madness.

As I have indicated, Gedney and one dog turned out to be missing in the end. When we came on that terrible shelter we had missed two dogs and two men; but the fairly unharmed dissecting tent, which we entered after investigating the monstrous graves, had something to reveal.

It was not as Lake had left it, for the covered parts of the primal monstrosity had been removed from the improvised table. Indeed, we had already realized that one of the six imperfect and insanely buried things we had found—the one with the trace of a peculiarly hateful odor—must represent the collected sections of the entity which Lake had tried to analyze.

On and around that laboratory table were strewn other things, and it did not take long for us to guess that those things were the carefully, though oddly and inexpertly dissected parts of one man and one dog. I shall spare the feelings of survivors by omitting mention of the man's identity.

Lake's anatomical instruments were missing, but there were evidences of their careful cleansing. The gasoline stove was also gone, though around it we found a curious litter of matches. We buried the human parts beside the other ten men, and the canine parts with the other thirty-five dogs. Concerning the bizarre smudges on the laboratory table, and on the jumble of roughly handled illustrated books scattered near it, we were much too bewildered to speculate.

This formed the worst of the camp horror, but other things were equally perplexing. The disappearance of Gedney, the one dog, the eight uninjured biological specimens, the three sledges, and certain instruments, illustrated technical and scientific books, writing materials, electric torches and batteries, food and fuel, heating apparatus, spare tents, fur suits, and the like, was utterly beyond sane conjecture; as were likewise the spatter-fringed ink blots on certain pieces of paper, and the evidences of curious alien fumbling and experi-

mentation around the planes and all other mechanical devices both at the camp and at the boring. The dogs seemed to abhor this oddly disordered machinery.

Then, too, there was the upsetting of the larder, the disappearance of certain staples, and the jarringly comical heap of tin cans pried open in the most unlikely ways and at the most unlikely places. The profusion of scattered matches, intact, broken, or spent, formed another minor enigma—as did the two or three tent cloths and fur suits which we found lying about with peculiar and unorthodox slashings conceivably due to clumsy efforts at unimaginable adaptations.

The maltreatment of the human and canine bodies, and the crazy burial of the damaged archæan specimens, were all of a piece with this apparent disintegrative madness. In view of just such an eventuality as the present one, we carefully photographed all the main evidences of insane disorder at the camp; and shall use the prints to buttress our pleas against the departure of the proposed Starkweather-Moore Expedition.

OUR FIRST ACT after finding the bodies in the shelter was to photograph and open the row of insane graves with the five-pointed snow mounds. We could not help noticing the resemblance of these monstrous mounds, with their clusters of grouped dots, to poor Lake's descriptions of the strange greenish soapstones; and when we came on some of the soapstones themselves in the great mineral pile we found the likeness very close indeed.

The whole general formation, it must be made clear, seemed abominably suggestive of the starfish head of the archæan entities; and we agreed that the suggestion must have worked potently upon the sensitized minds of Lake's overwrought party.

For madness—centering in Gedney as the only possible surviving agent—was the explanation spontaneously adopted by everybody so far as spoken utterance was concerned; though I will not be so naïve as to deny that each of us may have harbored wild guesses which sanity forbade him to formulate completely.

Sherman, Pabodie, and McTighe made an exhaustive aëroplane cruise over all the surrounding territory in the afternoon, sweeping the horizon with field glasses in quest of Gedney and of the various missing things; but nothing came to light.

The party reported that the titan-barrier range extended endlessly to right and left alike, without any diminution in height or essential structure. On some of the peaks, though, the regular cube and rampart formations were bolder and plainer, having doubly fantastic similitudes to Roerich-painted Asian hill ruins. The distribution of cryptical cave mouths on the black snow-denuded summits seemed roughly even as far as the range could be traced.

In spite of all the prevailing horrors we were left with enough sheer scientific zeal and adventurousness to wonder about the unknown realm beyond those mysterious mountains.

As our guarded messages stated, we rested at midnight after our day of terror and bafflement—but not without a tentative plan for one or more range-crossing altitude flights in a lightened plane with aërial camera and geologist's outfit, beginning the following morning.

It was decided that Danforth and I try it first, and we awaked at seven a. m. intending an early trip; though heavy winds—mentioned in our brief bulletin to the outside world—delayed our start till nearly nine o'clock.

I have already repeated the noncommittal story we told the men at camp—and relayed outside—after our return sixteen hours later. It is now my terrible duty to amplify this account by

filling in the merciful blanks with hints of what we really saw in that hidden transmontane world—hints of the revelations which have finally driven Danforth to a nervous collapse.

I wish he would add a really frank word about the thing which he thinks he alone saw—even though it was probably a nervous delusion—and which was perhaps the last straw that put him where he is; but he is firm against that. All I can do is to repeat his later disjointed whispers about what set him shrieking as the plane soared back through the wind-tortured mountain pass after that real and tangible shock which I shared.

This will form my last word. If the plain signs of surviving elder horrors in what I disclose be not enough to keep others from meddling with the inner antarctic—or at least from prying too deeply beneath the surface of that ultimate waste of forbidden secrets and unhuman, æon-cursed desolation—the responsibility for unnamable and perhaps immeasurable evils will not be mine.

DANFORTH AND I, studying the notes made by Pabodie in his afternoon flight and checking up with a sextant, had calculated that the lowest available pass in the range lay somewhat to the right of us, within sight of camp, and about twenty-three thousand or twenty-four thousand feet above sea level. For this point, then, we first headed in the lightened plane as we embarked on our flight of discovery.

The camp itself, on foothills which sprang from a high continental plateau, was some twelve thousand feet in altitude; hence the actual height increase necessary was not so vast as it might seem. Nevertheless we were acutely conscious of the rarefied air and intense cold as we rose; for, on account of visibility conditions, we had to leave the cabin windows open. We were dressed, of course, in our heaviest furs.

As we drew near the forbidding peaks, dark and sinister above the line of crevasse-riven snow and interstitial glaciers, we noticed more and more the curiously regular formations clinging to the slopes; and thought again of the strange Asian paintings of Nicholas Roerich.

The ancient and wind-weathered rock strata fully verified all of Lake's bulletins, and proved that these pinnacles had been towering up in exactly the same way since a surprisingly early time in earth's history—perhaps over fifty million years. How much higher they had once been, it was futile to guess; but everything about this strange region pointed to obscure atmospheric influences unfavorable to change, and calculated to retard the usual climatic processes of rock disintegration.

But it was the mountainside tangle of regular cubes, ramparts, and cave mouths which fascinated and disturbed us most. I studied them with a field glass and took aërial photographs while Danforth drove; and at times I relieved him at the controls—though my aviation knowledge was purely an amateur's—in order to let him use the binoculars.

We could easily see that much of the material of the things was a lightish archæan quartzite, unlike any formation visible over broad areas of the general surface; and that their regularity was extreme and uncanny to an extent which poor Lake had scarcely hinted.

As he had said, their edges were crumbled and rounded from untold æons of savage weathering; but their preternatural solidity and tough material had saved them from obliteration. Many parts, especially those closest to the slopes, seemed identical in substance with the surrounding rock surface.

The whole arrangement looked like the ruins of Macchu Picchu in the Andes, or the primal foundation walls of Kish as dug up by the Oxford-Field Museum Expedition in 1929; and both Danforth and I obtained that occasional

impression of separate Cyclopean blocks which Lake had attributed to his flight-companion Carroll.

How to account for such things in this place was frankly beyond me, and I felt queerly humbled as a geologist. Igneous formations often have strange regularities—like the famous Giants' Causeway in Ireland—but this stupendous range, despite Lake's original suspicion of smoking cones, was above all else nonvolcanic in evident structure.

The curious cave mouths, near which the odd formation seemed most abundant, presented another, albeit a lesser puzzle because of their regularity of outline. They were, as Lake's bulletin had said, often approximately square or semicircular; as if the natural orifices had been shaped to greater symmetry by some magic hand. Their numerousness and wide distribution were remarkable, and suggested that the whole region was honeycombed with tunnels dissolved out of limestone strata.

Such glimpses as we secured did not extend far within the caverns, but we saw that they were apparently clear of stalactites and stalagmites. Outside, those parts of the mountain slopes adjoining the apertures seemed invariably smooth and regular; and Danforth thought that the slight cracks and pittings of the weathering tended toward unusual patterns.

Filled as he was with the horrors and strangenesses discovered at the camp, he hinted that the pittings vaguely resembled those baffling groups of dots sprinkled over the primeval greenish soapstones, so hideously duplicated on the madly conceived snow mounds above those six buried monstrosities.

WE HAD risen gradually in flying over the higher foothills and along toward the relatively low pass we had selected. As we advanced we occasionally looked down at the snow and ice of the land route, wondering whether we could have attempted the trip with the simpler equipment of earlier days.

Somewhat to our surprise we saw that the terrain was far from difficult as such things go; and that despite the crevasses and other bad spots it would not have been likely to deter the sledges of a Scott, a Shackleton, or an Amundsen. Some of the glaciers appeared to lead up to wind-bared passes with unusual continuity, and upon reaching our chosen pass we found that its case formed no exception.

Our sensations of tense expectancy as we prepared to round the crest and peer out over an untrodden world can hardly be described on paper; even though we had no cause to think the regions beyond the range essentially different from those already seen and traversed. The touch of evil mystery in these barrier mountains, and in the beckoning sea of opalescent sky glimpsed betwixt their summits, was a highly subtle and attenuated matter not to be explained in literal words. Rather was it an affair of vague psychological symbolism and æsthetic association—a thing mixed up with exotic poetry and paintings, and with archaic myths lurking in shunned and forbidden volumes.

Even the wind's burden held a peculiar strain of conscious malignity; and for a second it seemed that the composite sound included a bizarre musical whistling, or piping over a wide range as the blast swept in and out of the omnipresent and resonant cave mouths. There was a cloudy note of reminiscent repulsion in this sound, as complex and unplaceable as any of the other dark impressions.

We were now, after a slow ascent, at a height of twenty-three thousand five hundred and seventy feet according to the aneroid; and had left the region of clinging snow definitely below us. Up here were only dark, bare rock slopes and the start of rough-ribbed glaciers—but with those provocative cubes,

The toughness of the things was almost incredible. Even terrific pressures were powerless to harm them!

ramparts, and echoing cave mouths to add a portent of the unnatural, the fantastic, and the dreamlike.

Looking along the line of high peaks, I thought I could see the one mentioned by poor Lake, with a rampart exactly on top. It seemed to be half lost in a queer antarctic haze—such a haze, perhaps, as had been responsible for Lake's early notion of volcanism.

The pass loomed directly before us, smooth and windswept between its jagged and malignly frowning pylons. Beyond it was a sky fretted with swirling vapors and lighted by the low polar sun—the sky of that mysterious farther realm upon which we felt no human eye had ever gazed.

A few more feet of altitude and we would behold that realm. Danforth and I, unable to speak except in shouts amidst the howling, piping wind that raced through the pass and added to the noise of the unmuffled engines, exchanged eloquent glances. And then, having gained those last few feet, we did indeed stare across the momentous divide and over the unsampled secrets of an elder and utterly alien earth.

V.

I THINK that both of us simultaneously cried out in mixed awe, wonder, terror, and disbelief in our own senses as we finally cleared the pass and saw what lay beyond. Of course, we must have had some natural theory in the back of our heads to steady our faculties for the moment. Probably we thought of such things as the grotesquely weathered stones of the Garden of the Gods in Colorado, or the fantastically symmetrical wind-carved rocks of the Arizona desert. Perhaps we even half thought the sight a mirage like that we had seen the morning before on first approaching those mountains of madness.

We must have had some such normal notions to fall back upon as our eyes swept that limitless, tempest-scarred plateau and grasped the almost endless labyrinth of colossal, regular, and geometrically eurythmic stone masses which reared their crumbled and pitted crests above a glacial sheet not more than forty or fifty feet deep at its thickest, and in places obviously thinner.

The effect of the monstrous sight was indescribable, for some fiendish violation of known natural law seemed certain at the outset. Here, on a hellishly ancient table-land fully twenty thousand feet high, and in a climate deadly to habitation since a prehuman age not less than five hundred thousand years ago, there stretched nearly to the vision's limit a tangle of orderly stone which only the desperation of mental self-defense could possibly attribute to any but a conscious and artificial cause.

We had previously dismissed, so far as serious thought was concerned, any theory that the cubes and ramparts of the mountainsides were other than natural in origin. How could they be otherwise, when man himself could scarcely have been differentiated from the great apes at the time when this region succumbed to the present unbroken reign of glacial death?

Yet now the sway of reason seemed irrefutably shaken, for this Cyclopean maze of squared, curved, and angled blocks had features which cut off all comfortable refuge. It was, very clearly, the blasphemous city of the mirage in stark, objective, and ineluctable reality. That damnable portent had had a material basis after all—there had been some horizontal stratum of ice dust in the upper air, and this shocking stone survival had projected its image across the mountains according to the simple laws of reflection. Of course, the phantom had been twisted and exaggerated, and had contained things which the real source did not contain; yet now, as we saw that real source, we thought it even

more hideous and menacing than its distant image.

Only the incredible, unhuman massiveness of these vast stone towers and ramparts had saved the frightful thing from utter annihilation in the hundreds of thousands—perhaps millions—of years it had brooded there amidst the blasts of a bleak upland. "Corona Mundi—Roof of the World——" All sorts of fantastic phrases sprang to our lips as we looked dizzily down at the unbelievable spectacle.

I thought again of the eldritch primal myths that had so persistently haunted me since my first sight of this dead antarctic world—of the demonic plateau of Leng, of the Mi-Go, or Abominable Snow Men of the Himalayas, of the Pnakotic Manuscripts with their prehuman implications, of the Cthulhu cult, of the *Necronomicon,* and of the Hyperborean legends of formless Tsathoggua and the worse than formless star spawn associated with that semientity.

FOR BOUNDLESS MILES in every direction the thing stretched off with very little thinning; indeed, as our eyes followed it to the right and left along the base of the low, gradual foothills which separated it from the actual mountain rim, we decided that we could see no thinning at all except for an interruption at the left of the pass through which we had come. We had merely struck, at random, a limited part of something of incalculable extent.

The foothills were more sparsely sprinkled with grotesque stone structures, linking the terrible city to the already familiar cubes and ramparts which evidently formed its mountain outposts. These latter, as well as the queer cave mouths, were as thick on the inner as on the outer sides of the mountains.

The nameless stone labyrinth consisted, for the most part, of walls from ten to one hundred and fifty feet in ice-clear height, and of a thickness varying from five to ten feet. It was composed mostly of prodigious blocks of dark primordial slate, schist, and sandstone—blocks in many cases as large as 4 x 6 x 8 feet—though in several places it seemed to be carved out of a solid, uneven bed rock of pre-Cambrian slate.

The buildings were far from equal in size, there being innumerable honeycomb arrangements of enormous extent as well as smaller separate structures.

The general shape of these things tended to be conical, pyramidal, or terraced; though there were many perfect cylinders, perfect cubes, clusters of cubes, and other rectangular forms, and a peculiar sprinkling of angled edifices whose five-pointed ground plan roughly suggested modern fortifications. The builders had made constant and expert use of the principle of the arch, and domes had probably existed in the city's heyday.

The whole tangle was monstrously weathered, and the glacial surface from where the towers projected was strewn with fallen blocks and immemorial débris. Where the glaciation was transparent we could see the lower parts of the gigantic piles, and we noticed the ice-preserved stone bridges which connected the different towers at varying distances above the ground. On the exposed walls we could detect the scarred places where other and higher bridges of the same sort had existed.

Closer inspection revealed countless largish windows; some of which were closed with shutters of a petrified material originally wood, though most gaped open in a sinister and menacing fashion.

Many of the ruins, of course, were roofless, and with uneven though wind-rounded upper edges; whilst others, of a more sharply conical or pyramidal model or else protected by higher surrounding structures, preserved intact outlines despite the omnipresent crum-

bling and pitting. With the field glass we could barely make out what seemed to be sculptural decorations in horizontal bands—decorations including those curious groups of dots whose presence on the ancient soapstones now assumed a vastly larger significance.

In many places the buildings were totally ruined and the ice sheet deeply riven from various geologic causes. In other places the stonework was worn down to the very level of the glaciation. One broad swath, extending from the plateau's interior to a cleft in the foothills about a mile to the left of the pass we had traversed, was wholly free from buildings. It probably represented, we concluded, the course of some great river which in Tertiary times—millions of years ago—had poured through the city and into some prodigious subterranean abyss of the great barrier range. Certainly, this was above all a region of caves, gulfs, and underground secrets beyond human penetration.

LOOKING BACK to our sensations, and recalling our dazedness at viewing this monstrous survival from æons we had thought prehuman, I can only wonder that we preserved the semblance of equilibrium which we did. Of course, we knew that something—chronology, scientific theory, or our own consciousness—was woefully awry; yet we kept enough poise to guide the plane, observe many things quite minutely, and take a careful series of photographs which may yet serve both us and the world in good stead.

In my case, ingrained scientific habit may have helped; for above all my bewilderment and sense of menace there burned a dominant curiosity to fathom more of this age-old secret—to know what sort of beings had built and lived in this incalculably gigantic place, and what relation to the general world of its time or of other times so unique a concentration of life could have had.

For this place could be no ordinary city. It must have formed the primary nucleus and center of some archaic and unbelievable chapter of earth's history whose outward ramifications, recalled only dimly in the most obscure and distorted myths, had vanished utterly amidst the chaos of terrene convulsions long before any human race we know had shambled out of apedom.

Here sprawled a Palæogæan megalopolis compared with which the fabled Atlantis and Lemuria, Commoriom and Uzuldaroum, and Olathoë in the land of Lomar are recent things of to-day—not even of yesterday; a megalopolis ranking with such whispered prehuman blasphemies as Valusia, R'lyeh, Ib in the land of Mnar, and the Nameless City of Arabia Deserta.

As we flew above that tangle of stark Titan towers my imagination sometimes escaped all bounds and roved aimlessly in realms of fantastic associations—even weaving links betwixt this lost world and some of my own wildest dreams concerning the mad horror at the camp.

The plane's fuel tank, in the interest of greater lightness, had been only partly filled; hence we now had to exert caution in our explorations. Even so, however, we covered an enormous extent of ground—or rather, air—after swooping down to a level where the wind became virtually negligible.

There seemed to be no limit to the mountain range, or to the length of the frightful stone city which bordered its inner foothills. Fifty miles of flight in each direction showed no major change in the labyrinth of rock and masonry that clawed up corpselike through the eternal ice.

There were, though, some highly absorbing diversifications; such as the carvings on the canyon where that broad river had once pierced the foothills and approached its sinking place in the great range.

The headlands at the stream's en-

trance had been boldly carved into Cyclopean pylons; and something about the ridgy, barrel-shaped designs stirred up oddly vague, hateful, and confusing semiremembrances in both Danforth and me.

We also came upon several star-shaped open spaces, evidently public squares, and noted various undulations in the terrain. Where a sharp hill rose, it was generally hollowed out into some sort of rambling stone edifice; but there were at least two exceptions. Of these latter, one was too badly weathered to disclose what had been on the jutting eminence, while the other still bore a fantastic conical monument carved out of the solid rock and roughly resembling such things as the well-known Snake Tomb in the ancient valley of Petra.

Flying inland from the mountains, we discovered that the city was not of infinite width, even though its length along the foothills seemed endless. After about thirty miles the grotesque stone buildings began to thin out, and in ten more miles we came to an unbroken waste virtually without signs of sentient artifice. The course of the river beyond the city seemed marked by a broad, depressed line, while the land assumed a somewhat greater ruggedness, seeming to slope slightly upward as it receded in the mist-hazed west.

So far we had made no landing, yet to leave the plateau without an attempt at entering some of the monstrous structures would have been inconceivable. Accordingly, we decided to find a smooth place on the foothills near our navigable pass, there grounding the plane and preparing to do some exploration on foot.

Though these gradual slopes were partly covered with a scattering of ruins, low flying soon disclosed an ample number of possible landing places. Selecting that nearest to the pass, since our next flight would be across the great range and back to camp, we succeeded about twelve thirty p. m. in coming down on a smooth, hard snow field wholly devoid of obstacles and well adapted to a swift and favorable take-off later on.

IT DID NOT seem necessary to protect the plane with a snow banking for so brief a time and in so comfortable an absence of high winds at this level; hence we merely saw that the landing skis were safely lodged, and that the vital parts of the mechanism were guarded against the cold.

For our foot journey we discarded the heaviest of our flying furs, and took with us a small outfit consisting of pocket compass, hand camera, light provisions, voluminous notebooks and paper, geologist's hammer and chisel, specimen bags, coil of climbing rope, and powerful electric torches with extra batteries; this equipment having been carried in the plane on the chance that we might be able to effect a landing, take ground pictures, make drawings and topographical sketches, and obtain rock specimens from some bare slope, outcropping, or mountain cave.

Fortunately, we had a supply of extra paper to tear up, place in a spare specimen bag, and use on the ancient principle of hare and hounds for marking our course in any interior mazes we might be able to penetrate. This had been brought in case we found some cave system with air quiet enough to allow such a rapid and easy method in place of the usual rock-chipping method of trail blazing.

Walking cautiously downhill over the crusted snow, toward the stupendous stone labyrinth that loomed against the opalescent west, we felt almost as keen a sense of imminent marvels as we had felt on approaching the unfathomed mountain pass four hours previously.

True, we had become visually familiar with the incredible secret concealed by the barrier peaks; yet the prospect of actually entering primordial walls

reared by conscious beings perhaps millions of years ago—before any known race of men could have existed—was none the less awesome and potentially terrible in its implications of cosmic abnormality.

Though the thinness of the air at this prodigious altitude made exertion somewhat more difficult than usual, both Danforth and I found ourselves bearing up very well, and felt equal to almost any task which might fall to our lot.

It took only a few steps to bring us to a shapeless ruin worn level with the snow, while ten or fifteen rods farther on there was a huge, roofless rampart still complete in its gigantic five-pointed outline, and rising to an irregular height of ten or eleven feet. For this latter we headed; and when at last we were actually able to touch its weathered Cyclopean blocks, we felt that we had established an unprecedented and almost blasphemous link with forgotten æons normally closed to our species.

This rampart, shaped like a star and perhaps three hundred feet from point to point, was built of Jurassic sandstone blocks of irregular size, averaging 6 x 8 feet in surface. There was a row of arched loopholes or windows about four feet wide and five feet high, spaced quite symmetrically along the points of the star and at its inner angles, and with the bottoms about four feet from the glaciated surface.

Looking through these, we could see that the masonry was fully five feet thick, that there were no partitions remaining within, and that there were traces of banded carvings or basreliefs on the interior walls—facts we had indeed guessed before, when flying low over this rampart and others like it. Though lower parts must have originally existed, all traces of such things were now wholly obscured by the deep layer of ice and snow at this point.

We crawled through one of the windows and vainly tried to decipher the nearly effaced mural designs, but did not attempt to disturb the glaciated floor. Our orientation flights had indicated that many buildings in the city proper were less ice-choked, and that we might perhaps find wholly clear interiors leading down to the true ground level if we entered those structures still roofed at the top.

Before we left the rampart we photographed it carefully, and studied its mortarless Cyclopean masonry with complete bewilderment. We wished that Pabodie were present, for his engineering knowledge might have helped us guess how such titanic blocks could have been handled in that unbelievably remote age when the city and its outskirts were built up.

THE HALF-MILE WALK downhill to the actual city, with the upper wind shrieking vainly and savagely through the skyward peaks in the background, was something of which the smallest details will always remain engraved on my mind. Only in fantastic nightmares could any human beings but Danforth and me conceive such optical effects.

Between us and the churning vapors of the west lay that monstrous tangle of dark stone towers, its outré and incredible forms impressing us afresh at every new angle of vision. It was a mirage in solid stone, and were it not for the photographs I would still doubt that such a thing could be. The general type of masonry was identical with that of the rampart we had examined; but the extravagant shapes which this masonry took in its urban manifestations were past all description.

Even the pictures illustrate only one or two phases of its endless variety, preternatural massiveness, and utterly alien exoticism. There were geometrical forms for which an Euclid could scarcely find a name—cones of all degrees of irregularity and truncation, ter-

races of every sort of provocative disproportion, shafts with odd bulbous enlargements, broken columns in curious groups, and five-pointed or five-ridged arrangements of mad grotesqueness.

As we drew nearer we could see beneath certain transparent parts of the ice sheet, and detect some of the tubular stone bridges that connected the crazily sprinkled structures at various heights. Of orderly streets there seemed to be none, the only broad open swath being a mile to the left, where the ancient river had doubtless flowed through the town into the mountains.

Our field glasses showed the external, horizontal bands of nearly effaced sculptures and dot groups to be very prevalent, and we could half imagine what the city must once have looked like—even though most of the roofs and tower tops had necessarily perished.

As a whole, it had been a complex tangle of twisted lanes and alleys, all of them deep canyons, and some little better than tunnels because of the overhanging masonry or overarching bridges.

Now, outspread below us, it loomed like a dream phantasy against a westward mist through whose northern end the low, reddish antarctic sun of early afternoon was struggling to shine; and when, for a moment, that sun encountered a denser obstruction and plunged the scene into temporary shadow, the effect was subtly menacing in a way I can never hope to depict. Even the faint howling and piping of the unfelt wind in the great mountain passes behind us took on a wilder note of purposeful malignity.

The last stage of our descent to the town was unusually steep and abrupt, and a rock outcropping at the edge where the grade changed led us to think that an artificial terrace had once existed there. Under the glaciation, we believed, there must be a flight of steps or its equivalent.

When at last we plunged into the town itself, clambering over fallen masonry and shrinking from the oppressive nearness and dwarfing height of omnipresent crumbling and pitted walls, our sensations again became such that I marvel at the amount of self-control we retained.

Danforth was frankly jumpy, and began making some offensively irrelevant speculations about the horror at the camp—which I resented all the more because I could not help sharing certain conclusions forced upon us by many features of this morbid survival from nightmare antiquity.

The speculations worked on his imagination, too; for in one place—where a débris-littered alley turned a sharp corner—he insisted that he saw faint traces of ground markings which he did not like; whilst elsewhere he stopped to listen to a subtle, imaginary sound from some undefined point—a muffled musical piping, he said, not unlike that of the wind in the mountain caves, yet somehow disturbingly different.

The ceaseless five-pointedness of the surrounding architecture and of the few distinguishable mural arabesques had a dimly sinister suggestiveness we could not escape, and gave us a touch of terrible subconscious certainty concerning the primal entities which had reared and dwelt in this unhallowed place.

Nevertheless, our scientific and adventurous souls were not wholly dead, and we mechanically carried out our program of chipping specimens from all the different rock types represented in the masonry. We wished a rather full set in order to draw better conclusions regarding the age of the place.

Nothing in the great outer walls seemed to date from later than the Jurassic and Comanchean periods, nor was any piece of stone in the entire place of a greater recency than the Pliocene age. In stark certainty, we were wandering

amidst a death which had reigned at least five hundred thousand years, and in all probability even longer.

AS WE PROCEEDED through this maze of stone-shadowed twilight we stopped at all available apertures to study interiors and investigate entrance possibilities. Some were above our reach, whilst others led only into ice-choked ruins as unroofed and barren as the rampart on the hill.

One, though spacious and inviting, opened on a seemingly bottomless abyss without visible means of descent. Now and then we had a chance to study the petrified wood of a surviving shutter, and were impressed by the fabulous antiquity implied in the still discernible grain. These things had come from Mesozoic gymnosperms and conifers—especially Cretaceous cycads—and from fan palms and early angiosperms of plainly Tertiary date. Nothing definitely later than the Pliocene could be discovered.

In the placing of these shutters—whose edges showed the former presence of queer and long-vanished hinges—usage seemed to be varied—some being on the outer and some on the inner side of the deep embrasures. They seemed to have become wedged in place, thus surviving the rusting of their former and probably metallic fixtures and fastenings.

After a time we came across a row of windows—in the bulges of a colossal five-edged cone of undamaged apex—which led into a vast, well-preserved room with stone flooring; but these were too high in the room to permit descent without a rope. We had a rope with us, but did not wish to bother with this twenty-foot drop unless obliged to—especially in this thin plateau air where great demands were made upon the heart action.

This enormous room was probably a hall or concourse of some sort, and our electric torches showed bold, distinct, and potentially startling sculptures arranged round the walls in broad, horizontal bands separated by equally broad strips of conventional arabesques. We took careful note of this spot, planning to enter here unless a more easily gained interior was encountered.

Finally, though, we did encounter exactly the opening we wished; an archway about six feet wide and ten feet high, marking the former end of an aërial bridge which had spanned an alley about five feet above the present level of glaciation. These archways, of course, were flush with upper-story floors, and in this case one of the floors still existed.

The building thus accessible was a series of rectangular terraces on our left facing westward. That across the alley, where the other archway yawned, was a decrepit cylinder with no windows and with a curious bulge about ten feet above the aperture. It was totally dark inside, and the archway seemed to open on a well of illimitable emptiness.

Heaped débris made the entrance to the vast left-hand building doubly easy, yet for a moment we hesitated before taking advantage of the long-wished chance. For though we had penetrated into this tangle of archaic mystery, it required fresh resolution to carry us actually inside a complete and surviving building of a fabulous elder world whose nature was becoming more and more hideously plain to us.

In the end, however, we made the plunge, and scrambled up over the rubble into the gaping embrasure. The floor beyond was of great slate slabs, and seemed to form the outlet of a long, high corridor with sculptured walls.

Observing the many inner archways which led off from it, and realizing the probable complexity of the nest of apartments within, we decided that we must begin our system of hare-and-hound trail blazing. Hitherto our com-

passes, together with frequent glimpses of the vast mountain range between the towers in our rear, had been enough to prevent our losing our way; but from now on, the artificial substitute would be necessary.

Accordingly we reduced our extra paper to shreds of suitable size, placed these in a bag to be carried by Danforth, and prepared to use them as economically as safety would allow. This method would probably gain us immunity from straying, since there did not appear to be any strong air currents inside the primordial masonry. If such should develop, or if our paper supply should give out, we could of course fall back on the more secure though more tedious and retarding method of rock chipping.

Just how extensive a territory we had opened up, it was impossible to guess without a trial. The close and frequent connection of the different buildings made it likely that we might cross from one to another on bridges underneath the ice, except where impeded by local collapses and geologic rifts, for very little glaciation seemed to have entered the massive constructions.

Almost all the areas of transparent ice had revealed the submerged windows as tightly shuttered, as if the town had been left in that uniform state until the glacial sheet came to crystallize the lower part for all succeeding time. Indeed, one gained a curious impression that this place had been deliberately closed and deserted in some dim, bygone æon, rather than overwhelmed by any sudden calamity or even gradual decay. Had the coming of the ice been foreseen, and had a nameless population left *en masse* to seek a less doomed abode?

The precise physiographic conditions attending the formation of the ice sheet at this point would have to wait for later solution. It had not, very plainly, been a grinding drive. Perhaps the pressure of accumulated snows had been responsible, and perhaps some flood from the river, or from the bursting of some ancient glacial dam in the great range, had helped to create the special state now observable. Imagination could conceive almost anything in connection with this place.

VI.

IT WOULD BE cumbrous to give a detailed, consecutive account of our wanderings inside that cavernous, æon-dead honeycomb of primal masonry—that monstrous lair of elder secrets which now echoed for the first time, after uncounted epochs, to the tread of human feet.

This is especially true because so much of the horrible drama and revelation came from a mere study of the omnipresent mural carvings. Our flashlight photographs of those carvings will do much toward proving the truth of what we are now disclosing, and it is lamentable that we had not a larger film supply with us. As it was, we made crude notebook sketches of certain salient features after all our films were used up.

The building which we had entered was one of great size and elaborateness, and gave us an impressive notion of the architecture of that nameless geologic past. The inner partitions were less massive than the uter walls, but on the lower levels were excellently preserved. Labyrinthine complexity, involving curiously irregular differences in floor levels, characterized the entire arrangement; and we should certainly have been lost at the very outset but for the trail of torn paper left behind us.

We decided to explore the more decrepit upper parts first of all, hence climbed aloft in the maze for a distance of some one hundred feet, to where the topmost tier of chambers yawned snowily and ruinously open to the polar sky. Ascent was effected over the steep, transversely ribbed stone ramps or in-

clined planes which everywhere served in lieu of stairs.

The rooms we encountered were of all imaginable shapes and proportions, ranging from five-pointed stars to triangles and perfect cubes. It might be safe to say that their general average was about 30 x 30 feet in floor area, and twenty feet in height, though many larger apartments existed.

After thoroughly examining the upper regions and the glacial level we descended, story by story, into the submerged part, where indeed we soon saw we were in a continuous maze of connected chambers and passages probably leading over unlimited areas outside this particular building.

The Cyclopean massiveness and giganticism of everything about us became curiously oppressive; and there was something vaguely but deeply unhuman in all the contours, dimensions, proportions, decorations, and constructional nuances of the blasphemously archaic stonework. We soon realized, from what the carvings revealed, that this monstrous city was many million years old.

We cannot yet explain the engineering principles used in the anomalous balancing and adjustment of the vast rock masses, though the function of the arch was clearly much relied on. The rooms we visited were wholly bare of all portable contents, a circumstance which sustained our belief in the city's deliberate desertion. The prime decorative feature was the almost universal system of mural sculpture, which tended to run in continuous horizontal bands three feet wide and arranged from floor to ceiling in alternation with bands of equal width given over to geometrical arabesques.

There were exceptions to this rule of arrangement, but its preponderance was overwhelming. Often, however, a series of smooth cartouches containing oddly patterned groups of dots would be sunk along one of the arabesque bands.

THE TECHNIQUE, we soon saw, was mature, accomplished, and æsthetically evolved to the highest degree of civilized mastery, though utterly alien in every detail to any known art tradition of the human race. In delicacy of execution no sculpture I have ever seen could approach it. The minutest details of elaborate vegetation, or of animal life, were rendered with astonishing vividness despite the bold scale of the carvings; whilst the conventional designs were marvels of skillful intricacy.

The arabesques displayed a profound use of mathematical principles, and were made up of obscurely symmetrical curves and angles based on the quantity of five.

The pictorial bands followed a highly formalized tradition, and involved a peculiar treatment of perspective, but had an artistic force that moved us profoundly notwithstanding the intervening gulf of vast geologic periods.

Their method of design hinged on a singular juxtaposition of the cross section with the two-dimensional silhouette, and embodied an analytical psychology beyond that of any known race of antiquity. It is useless to try to compare this art with any represented in our museums. Those who see our photographs will probably find its closest analogue in certain grotesque conceptions of the most daring futurists.

The arabesque tracery consisted altogether of depressed lines, whose depth on unweathered walls varied from one to two inches. When cartouches with dot groups appeared—evidently as inscriptions in some unknown and primordial language and alphabet—the depression of the smooth surface was perhaps an inch and a half, and of the dots perhaps a half inch more. The pictorial bands were in countersunk low relief, their background being depressed about

two inches from the original wall surface.

In some specimens marks of a former coloration could be detected, though for the most part the untold æons had disintegrated and banished any pigments which may have been applied. The more one studied the marvelous technique the more one admired the things. Beneath their strict conventionalization one could grasp the minute and accurate observation and graphic skill of the artists; and indeed, the very conventions themselves served to symbolize and accentuate the real essence or vital differentiation of every object delineated.

We felt, too, that besides these recognizable excellences there were others lurking beyond the reach of our perceptions. Certain touches here and there gave vague hints of latent symbols and stimuli which another mental and emotional background, and a fuller or different sensory equipment, might have made of profound and poignant significance to us.

The subject matter of the sculptures obviously came from the life of the vanished epoch of their creation, and contained a large proportion of evident history. It is this abnormal historic-mindedness of the primal race—a chance circumstance operating, through coincidence, miraculously in our favor—which made the carvings so awesomely informative to us, and which caused us to place their photography and transcription above all other considerations.

In certain rooms the dominant arrangement was varied by the presence of maps, astronomical charts, and other scientific designs on an enlarged scale—these things giving a naïve and terrible corroboration to what we gathered from the pictorial friezes and dados.

In hinting at what the whole revealed, I can only hope that my account will not arouse a curiosity greater than sane caution on the part of those who believe me at all. It would be tragic if any were to be allured to that realm of death and horror by the very warning meant to discourage them.

INTERRUPTING these sculptured walls were high windows and massive twelve-foot doorways; both now and then retaining the petrified wooden planks—elaborately carved and polished—of the actual shutters and doors. All metal fixtures had long ago vanished, but some of the doors remained in place and had to be forced aside as we progressed from room to room.

Window frames with odd transparent panes—mostly elliptical—survived here and there, though in no considerable quantity. There were also frequent niches of great magnitude, generally empty, but once in a while containing some bizarre object carved from green soapstone which was either broken or perhaps held too inferior to warrant removal.

Other apertures were undoubtedly connected with bygone mechanical facilities—heating, lighting, and the like—of a sort suggested in many of the carvings. Ceilings tended to be plain, but had sometimes been inlaid with green soapstone or other tiles, mostly fallen now. Floors were also paved with such tiles, though plain stonework predominated.

As I have said, all furniture and other movables were absent; but the sculptures gave a clear idea of the strange devices which had once filled these tomblike, echoing rooms. Above the glacial sheet the floors were generally thick with detritus, litter, and débris, but farther down this condition decreased.

In some of the lower chambers and corridors there was little more than gritty dust or ancient incrustations, while occasional areas had an uncanny air of newly swept immaculateness. Of course, where rifts or collapses had oc-

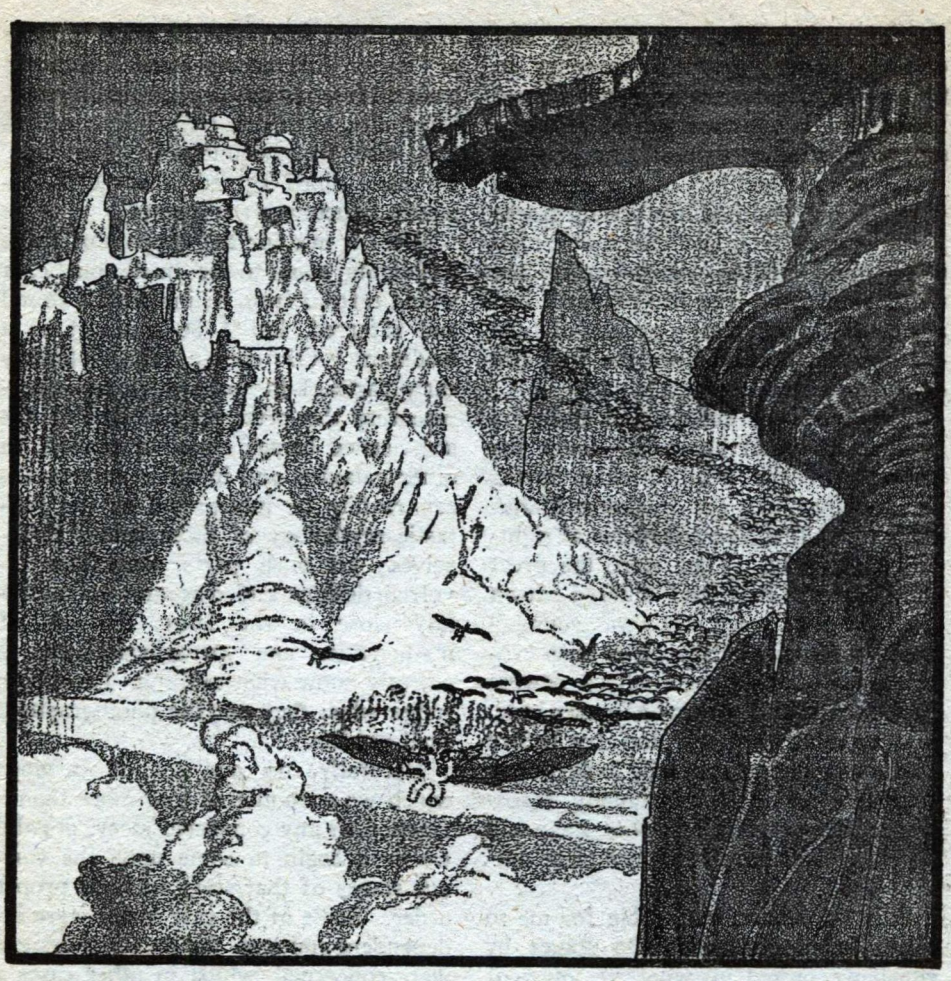
It was, very clearly, the blasphemous city of the mirage—in stark, objective reality!

curred, the lower levels were as littered as the upper ones.

A central court—as we had seen in other structures, from the air—saved the inner regions from total darkness; so that we seldom had to use our electric torches in the upper rooms except when studying sculptured details. Below the ice cap, however, the twilight deepened; and in many parts of the tangled ground level there was an approach to absolute blackness.

To form even a rudimentary idea of our thoughts and feelings as we penetrated this æon-silent maze of unhuman masonry one must correlate a hopelessly bewildering chaos of fugitive moods, memories, and impressions. The sheer appalling antiquity and lethal desolation of the place were enough to overwhelm almost any sensitive person, but added to these elements were the recent unexplained horror at the camp, and the revelations all too soon effected by the terrible mural sculptures around us.

The moment we came upon a perfect section of carving, where no ambiguity of interpretation could exist, it took only



a brief study to give us the hideous truth—a truth which it would be naïve to claim Danforth and I had not independently suspected before, though we had carefully refrained from even hinting it to each other. There could now be no further merciful doubt about the nature of the beings which had built and inhabited this monstrous dead city millions of years ago, when man's ancestors were primitive archaic mammals, and vast Dinosaurio roamed the tropical steppes of Europe and Asia.

We had previously clung to a desperate alternative and insisted—each to himself—that the omnipresence of the five-pointed motif meant only some cultural or religious exaltation of the archæan natural object which had so patently embodied the quality of five-pointedness; as the decorative motifs of Minoan Crete exalted the sacred bull, those of Egypt the scarabæus, those of Rome the wolf and the eagle, and those of various savage tribes some chosen totem animal.

But this lone refuge was now stripped from us, and we were forced to face definitely the reason-shaking realization which the reader of these pages has doubtless long ago anticipated. I can scarcely bear to write it down in black and white even now, but perhaps that will not be necessary.

THE THINGS once rearing and dwelling in this frightful masonry in the age of Dinosauria were not indeed Dinosauria, but far worse. Mere Dinosauria were new and almost brainless objects—but the builders of the city were wise and old, and had left certain traces in rocks even then laid down well nigh a thousand million years—rocks laid down before the true life of earth had advanced beyond plastic groups of cells—rocks laid down before the true life of earth had existed at all.

They were the makers and enslavers of that life, and above all doubt the originals of the fiendish elder myths which things like the Pnakotic Manuscripts and the *Necronomicon* affrightedly hint about. They were the great "Old Ones" that had filtered down from the stars when earth was young—the beings whose substance an alien evolution had shaped, and whose powers were such as this planet had never bred. And to think that only the day before Danforth and I had actually looked upon fragments of their millennially fossilized substance—and that poor Lake and his party had seen their complete outlines——

It is, of course, impossible for me to relate in proper order the stages by which we picked up what we know of that monstrous chapter of prehuman life. After the first shock of the certain revelation, we had to pause a while to recuperate, and it was fully three o'clock before we got started on our actual tour of systematic research.

The sculptures in the building we entered were of relatively late date—perhaps two million years ago—as checked up by geological, biological, and astronomical features—and embodied an art which would be called decadent in comparison with that of specimens we found in older buildings, after crossing bridges under the glacial sheet.

One edifice hewn from the solid rock seemed to go back forty or possibly even fifty million years—to the lower Eocene or upper Cretaceous—and contained bas-reliefs of an artistry surpassing anything else, with one tremendous exception, that we encountered. That was, we have since agreed, the oldest domestic structure we traversed.

Were it not for the support of those flashlights soon to be made public, I would refrain from telling what I found and inferred, lest I be confined as a madman. Of course, the infinitely early parts of the patchwork tale—representing the preterrestrial life of the star-headed beings on other planets, in other galaxies, and in other universes—can readily be interpreted as the fantastic mythology of those beings themselves; yet such parts sometimes involved designs and diagrams so uncannily close to the latest findings of mathematics and astrophysics that I scarcely know what to think. Let others judge when they see the photographs I shall publish.

Naturally, no one set of carvings which we encountered told more than a fraction of any connected story, nor did we even begin to come upon the various stages of that story in their proper order. Some of the vast rooms were independent units so far as their designs were concerned, whilst in other cases a continuous chronicle would be carried through a series of rooms and corridors.

The best of the maps and diagrams were on the walls of a frightful abyss below even the ancient ground level—a cavern perhaps two hundred feet square and sixty feet high, which had almost undoubtedly been an educational center of some sort.

There were many provoking repetitions of the same material in different rooms and buildings, since certain chapters of experience, and certain summaries or phases of racial history, had evidently been favorites with different decorators or dwellers. Sometimes, though, variant versions of the same

theme proved useful in settling debatable points and filling up gaps.

I still wonder that we deduced so much in the short time at our disposal. Of course, we even now have only the barest outline—and much of that was obtained later on from a study of the photographs and sketches we made.

It may be the effect of this later study—the revived memories and vague impressions acting in conjunction with his general sensitiveness and with that final supposed horror-glimpse whose essence he will not reveal even to me—which has been the immediate source of Danforth's present breakdown.

But it had to be; for we could not issue our warning intelligently without the fullest possible information, and the issuance of that warning is a prime necessity. Certain lingering influences in that unknown antarctic world of disordered time and alien natural law make it imperative that further exploration be discouraged.

VII.

THE FULL STORY, so far as deciphered, will eventually appear in an official bulletin of Miskatonic University. Here I shall sketch only the salient high lights in a formless, rambling way. Myth or otherwise, the sculptures told of the coming of those star-headed things to the nascent, lifeless earth out of cosmic space—their coming, and the coming of many other alien entities such as at certain times embark upon spatial pioneering.

They seemed able to traverse the interstellar ether on their vast membranous wings—thus oddly confirming some curious hill folklore long ago told me by an antiquarian colleague. They had lived under the sea a good deal, building fantastic cities and fighting terrific battles with nameless adversaries by means of intricate devices employing unknown principles of energy.

Evidently their scientific and mechanical knowledge far surpassed man's today, though they made use of its more widespread and elaborate forms only when obliged to.

Some of the sculptures suggested that they had passed through a stage of mechanized life on other planets, but had receded upon finding its effects emotionally unsatisfying. Their preternatural toughness of organization and simplicity of natural wants made them peculiarly able to live on a high plane without the more specialized fruits of artificial manufacture, and even without garments, except for occasional protection against the elements.

It was under the sea, at first for food and later for other purposes, that they first created earth life—using available substances according to long-known methods.

The more elaborate experiments came after the annihilation of various cosmic enemies. They had done the same thing on other planets, having manufactured not only necessary foods, but certain multicellular protoplasmic masses capable of molding their tissues into all sorts of temporary organs under hypnotic influence and thereby forming ideal slaves to perform the heavy work of the community.

These viscous masses were without doubt what Abdul Alhazred whispered about as the "Shoggoths" in his frightful *Necronomicon*, though even that mad Arab had not hinted that any existed on earth except in the dreams of those who had chewed a certain alkaloidal herb.

When the star-headed Old Ones on this planet had synthesized their simple food forms and bred a good supply of Shoggoths, they allowed other cell groups to develop into other forms of animal and vegetable life for sundry purposes, extirpating any whose presence became troublesome.

With the aid of the Shoggoths, whose expansions could be made to lift prodigious weights, the small, low cities

under the sea grew to vast and imposing labyrinths of stone not unlike those which later rose on land. Indeed, the highly adaptable Old Ones had lived much on land in other parts of the universe, and probably retained many traditions of land construction.

As we studied the architecture of all these sculptured Palæogæan cities, including that whose æon-dead corridors we were even then traversing, we were impressed by a curious coincidence which we have not yet tried to explain, even to ourselves. The tops of the buildings, which in the actual city around us had, of course, been weathered into shapeless ruins ages ago, were clearly displayed in the bas-reliefs, and showed vast clusters of needlelike spires, delicate finials on certain cone and pyramid apexes, and tiers of thin, horizontal scalloped disks capping cylindrical shafts.

This was exactly what we had seen in that monstrous and portentous mirage, cast by a dead city whence such sky-line features had been absent for thousands and ten of thousands of years, which loomed on our ignorant eyes across the unfathomed mountains of madness as we first approached poor Lake's ill-fated camp.

OF THE LIFE of the Old Ones, both under the sea and after part of them migrated to land, volumes could be written. Those in shallow water had continued the fullest use of the eyes at the ends of their five main head tentacles, and had practiced the arts of sculpture and of writing in quite the usual way—the writing accomplished with a stylus on waterproof waxen surfaces.

Those lower down in the ocean depths, though they used a curious phosphorescent organism to furnish light, pieced out their vision with obscure special senses operating through the prismatic cilia on their heads—senses which rendered all the Old Ones partly independent of light in emergencies. Their forms of sculpture and writing had changed curiously during the descent, embodying certain apparently chemical coating processes—probably to secure phosphorescence—which the bas-reliefs could not make clear to us.

The beings moved in the sea partly by swimming—using the lateral crinoid arms—and partly by wriggling with the lower tier of tentacles containing the pseudofeet. Occasionally they accomplished long swoops with the auxiliary use of two or more sets of their fan-like folding wings.

On land they locally used the pseudofeet, but now and then flew to great heights or over long distances with their wings. The many slender tentacles into which the crinoid arms branched were infinitely delicate, flexible, strong, and accurate in muscular-nervous coördination—ensuring the utmost skill and dexterity in all artistic and other manual operations.

The toughness of the things was almost incredible. Even the terrific pressure of the deepest sea bottoms appeared powerless to harm them. Very few seemed to die at all except by violence, and their burial places were very limited. The facts that they covered their vertically inhumed dead with five-pointed inscribed mounds set up thoughts in Danforth and me which made a fresh pause and recuperation necessary after the sculptures revealed it.

The beings multiplied by means of spores—like vegetable pteridophyta, as Lake had suspected—but, owing to their prodigious toughness and longevity, and consequent lack of replacement needs, they did not encourage the large-scale development of new prothallia except when they had new regions to colonize.

The young matured swiftly, and received an education evidently beyond any standard we can imagine. The pre-

vailing intellectual and æsthetic life was highly evolved, and produced a tenaciously enduring set of customs and institutions which I shall describe more fully in my coming monograph. These varied slightly according to sea or land residence, but had the same foundations and essentials.

Though able, like vegetables, to derive nourishment from inorganic substances; they vastly preferred organic and especially animal food. They ate uncooked marine life under the sea, but cooked their viands on land. They hunted game and raised meat herds—slaughtering with sharp weapons whose odd marks on certain fossil bones our expedition had noted.

They resisted all ordinary temperatures marvelously, and in their natural state could live in water down to freezing. When the great chill of the Pleistocene drew on, however—nearly a million years ago—the land dwellers had to resort to special measures, including artificial heating—until, at last, the deadly cold appears to have driven them back into the sea.

For their prehistoric flights through cosmic space, legend said, they had absorbed certain chemicals and become almost independent of eating, breathing, or heat conditions—but by the time of the great cold they had lost track of the method. In any case, they could not have prolonged the artificial state indefinitely without harm.

Being nonpairing and semivegetable in structure, the Old Ones had no biological basis for the family phase of mammal life, but seemed to organize large households on the principles of comfortable space-utility and—as we deduced from the pictured occupations and diversions of codwellers—congenial mental association.

In furnishing their homes they kept everything in the center of the huge rooms, leaving all wall spaces free for decorative treatment. Lighting, in the case of the land inhabitants, was accomplished by a device probably electrochemical in nature.

Both on land and under water they used curious tables, chairs and couches like cylindrical frames—for they rested and slept upright with folded-down tentacles—and racks for the hinged sets of dotted surfaces forming their books.

GOVERNMENT was evidently complex and probably socialistic, though no certainties in this regard could be deduced from the sculptures we saw. There was extensive commerce, both local and between different cities—certain small, flat counters, five-pointed and inscribed, serving as money. Probably the smaller of the various greenish soapstones found by our expedition were pieces of such currency.

Though the culture was mainly urban, some agriculture and much stock raising existed. Mining and a limited amount of manufacturing were also practiced. Travel was very frequent, but permanent migration seemed relatively rare except for the vast colonizing movements by which the race expanded.

For personal locomotion no external aid was used, since in land, air, and water movement alike the Old Ones seemed to possess excessively vast capacities for speed. Loads, however, were drawn by beasts of burden—Shoggoths under the sea, and a curious variety of primitive vertebrates in the later years of land existence.

These vertebrates, as well as an infinity of other life forms—animal and vegetable, marine, terrestrial, and aërial—were the products of unguided evolution acting on life cells made by the Old Ones, but escaping beyond their radius of attention. They had been suffered to develop unchecked because they had not come in conflict with the dominant beings. Bothersome forms, of course, were mechanically exterminated.

It interested us to see in some of the very last and most decadent sculptures a shambling, primitive mammal, used sometimes for food and sometimes as an amusing buffoon by the land dwellers, whose vaguely simian and human foreshadowings were unmistakable. In the building of land cities the huge stone blocks of the high towers were generally lifted by vast-winged pterodactyls of a species heretofore unknown to paleontology.

The persistence with which the Old Ones survived various geologic changes and convulsions of the earth's crust was little short of miraculous. Though few or none of their first cities seem to have remained beyond the Archæan Age, there was no interruption in their civilization or in the transmission of their records.

Their original place of advent to the planet was the Antarctic Ocean, and it is likely that they came not long after the matter forming the moon was wrenched from the neighboring South Pacific. According to one of the sculptured maps, the whole globe was then under water, with stone cities scattered farther and farther from the antarctic as æons passed.

Another map shows a vast bulk of dry land around the south pole, where it is evident that some of the beings made experimental settlements, though their main centers were transferred to the nearest sea bottom.

Later maps, which display this land mass as cracking and drifting, and sending certain detached parts northward, uphold in a striking way the theories of continental drift lately advanced by Taylor, Wegener, and Joly.

With the upheaval of new land in the South Pacific, tremendous events began. Some of the marine cities were hopelessly shattered, yet that was not the worst misfortune. Another race—a land race of beings shaped like octopi and probably corresponding to the fabulous prehuman spawn of Cthulhu—soon began filtering down from cosmic infinity and precipitated a monstrous war which for a time drove the Old Ones wholly back to the sea—a colossal blow in view of the increasing land settlements.

Later, peace was made, and the new lands were given to the Cthulhu spawn whilst the Old Ones held the sea and the older lands. New land cities were founded—the greatest of them in the antarctic, for this region of first arrival was sacred.

From then on, as before, the antarctic remained the center of the Old Ones' civilization, and all the cities built there by the Cthulhu spawn were blotted out.

Then, suddenly, the lands of the Pacific sank again, taking with them the frightful stone city of R'lyeh and all the cosmic octopi, so that the Old Ones were again supreme on the planet, except for one shadowy fear about which they did not like to speak.

At a rather later age their cities dotted all the land and water areas of the globe—hence the recommendation in my coming monograph that some archæologist make systematic borings with Pabodie's type of apparatus in certain widely separated regions.

THE STEADY TREND down the ages was from water to land—a movement encouraged by the rise of new land masses, though the ocean was never wholly deserted. Another cause of the landward movement was the new difficulty in breeding and managing the Shoggoths upon which successful sea life depended.

With the march of time, as the sculptures sadly confessed, the art of creating new life from inorganic matter had been lost, so that the Old Ones had to depend on the molding of forms already in existence. On land the great reptiles proved highly tractable; but the Shoggoths of the sea, reproducing by fission and acquiring a dangerous de-

gree of accidental intelligence, presented for a time a formidable problem.

They had always been controlled through the hypnotic suggestion of the Old Ones, and had modeled their tough plasticity into various useful temporary limbs and organs; but now their self-modeling powers were sometimes exercised independently, and in various imitative forms implanted by past suggestion. They had, it seems, developed a semistable brain whose separate and occasionally stubborn volition echoed the will of the Old Ones without always obeying it.

Sculptured images of these Shoggoths filled Danforth and me with horror and loathing. They were normally shapeless entities composed of a viscous jelly which looked like an agglutination of bubbles, and each averaged about fifteen feet in diameter when a sphere. They had, however, a constantly shifting shape and volume—throwing out temporary developments or forming apparent organs of sight, hearing, and speech in imitation of their masters, either spontaneously or according to suggestion.

They seem to have become peculiarly intractable toward the middle of the Permian Age, perhaps one hundred and fifty million years ago, when a veritable war of resubjugation was waged upon them by the marine Old Ones. Pictures of this war, and of the headless, slime-coated fashion in which the Shoggoths typically left their slain victims, held a marvelously fearsome quality despite the intervening abyss of untold ages.

The Old Ones had used curious weapons of molecular disturbance against the rebel entities, and in the end had achieved a complete victory. Thereafter the sculptures showed a period in which Shoggoths were tamed and broken by armed Old Ones as the wild horses of the American west were tamed by cowboys.

Though during the rebellion the Shoggoths had shown an ability to live out of water, this transition was not encouraged—since their usefulness on land would hardly have been commensurate with the trouble of their management.

During the Jurassic Age the Old Ones met fresh adversity in the form of a new invasion from outer space—this time by half-fungous, half-crustacean creatures—creatures undoubtedly the same as those figuring in certain whispered hill legends of the north, and remembered in the Himalayas as the Mi-Go, or Abominable Snow Men.

To fight these beings the Old Ones attempted, for the first time since their terrene advent, to sally forth again into the planetary ether; but, despite all traditional preparations, found it no longer possible to leave the earth's atmosphere. Whatever the old secret of interstellar travel had been, it was now definitely lost to the race.

In the end the Mi-Go drove the Old Ones out of all the northern lands, though they were powerless to disturb those in the sea. Little by little the slow retreat of the elder race to their original antarctic habitat was beginning.

IT WAS CURIOUS to note from the pictured battles that both the Cthulhu spawn and the Mi-Go seem to have been composed of matter more widely different from that which we know than was the substance of the Old Ones. They were able to undergo transformations and reintegrations impossible for their adversaries, and seem therefore to have originally come from even remoter gulfs of cosmic space.

The Old Ones, but for their abnormal toughness and peculiar vital properties, were strictly material, and must have had their absolute origin within the known space-time continuum—whereas the first sources of the other beings can only be guessed at with bated breath.

All this, of course, assuming that the nonterrestrial linkages and the anomalies ascribed to the invading foes are not pure mythology. Conceivably, the Old Ones might have invented a cosmic framework to account for their occasional defeats, since historical interest and pride obviously formed their chief psychological element. It is significant that their annals failed to mention many advanced and potent races of beings whose mighty cultures and towering ethics figure persistently in certain obscure legends.

The changing state of the world through long geologic ages appeared with startling vividness in many of the sculptured maps and scenes. In certain cases existing science will require revision, while in other cases its bold deductions are magnificently confirmed.

As I have said, the hypothesis of Taylor, Wegener, and Joly that all the continents are fragments of an original antarctic land mass which cracked from centrifugal force and drifted apart over a technically viscous lower surface—an hypothesis suggested by such things as the complimentary outlines of Africa and South America, and the way the great mountain chains are rolled and shoved up—receives striking support from this uncanny source.

Maps evidently showing the Carboniferous of an hundred million or more years ago displayed significant rifts and chasms destined later to separate Africa from the once continuous realms of Europe (then the Valusia of primal legend), Asia, the Americas, and the antarctic continent.

Other charts—and most significantly one in connection with the founding fifty million years ago of the vast dead city around us—showed all the present continents well differentiated. And in the latest discoverable specimen—dating perhaps from the Pliocene Age—the approximate world of to-day appeared quite clearly despite the linkage of Alaska with Siberia, of North America with Europe through Greenland, and of South America with the antarctic continent through Graham Land.

In the Carboniferous map the whole globe—ocean floor and rifted land mass alike—bore symbols of the Old Ones' vast stone cities, but in the later charts the gradual recession toward the antarctic became very plain.

The final Pliocene specimen showed no land cities except on the antarctic continent and the tip of South America, nor any ocean cities north of the fiftieth parallel of South Latitude. Knowledge and interest in the northern world, save for a study of coast lines probably made during long exploration flights on those fanlike membranous wings, had evidently declined to zero among the Old Ones.

Destruction of cities through the upthrust of mountains, the centrifugal rending of continents, the seismic convulsions of land or sea bottom, and other natural causes was a matter of common record; and it was curious to observe how fewer and fewer replacements were made as the ages wore on.

The vast dead megalopolis that yawned around us seemed to be the last general center of the race—built early in the Cretaceous Age after a titanic earth buckling had obliterated a still vaster predecessor not far distant.

It appeared that this general region was the most sacred spot of all, where reputedly the first Old Ones had settled on a primal sea bottom. In the new city—many of whose features we could recognize in the sculptures, but which stretched fully a hundred miles along the mountain range in each direction beyond the farthest limits of our aërial survey—there were reputed to be preserved certain sacred stones forming part of the first sea-bottom city, which were thrust up to light after long epochs in the course of the general crumpling of strata.

VIII.

NATURALLY, Danforth and I studied with special interest and a peculiarly personal sense of awe everything pertaining to the immediate district in which we were. Of this local material there was naturally a vast abundance.

On the tangled ground level of the city we were lucky enough to find a house of very late date whose walls, though somewhat damaged by a neighboring rift, contained sculptures of decadent workmanship carrying the story of the region, much beyond the Pliocene map, whence we derived our last general glimpse of the prehuman world. This was the last place we examined in detail, since what we found there set upon us a fresh, immediate objective.

Certainly, we were in one of the strangest, weirdest, and most terrible of all the corners of earth's globe. Of all existing lands it was infinitely the most ancient. The conviction grew upon us that this hideous upland must indeed be the fabled nightmare plateau of Leng which even the mad author of the *Necronomicon* was reluctant to discuss.

The great mountain chain was tremendously long—starting as a low range at Luitpold Land on the coast of Weddell Sea and virtually crossing the entire continent. The really high part stretched in a mighty arc from about Latitude 82°, E. Longitude 60° to Latitude 70°, East Longitude 115°, with its concave side toward our camp and its seaward end in the region of that long, ice-locked coast whose hills were glimpsed by Wilkes and Mawson at the antarctic circle.

Yet even more monstrous exaggerations of nature seemed disturbingly close at hand. I have said that these peaks are higher than the Himalayas, but the sculptures forbid me to say that they are earth's highest. That grim honor is beyond doubt reserved for something which half the sculptures hesitated to record at all, whilst others approached it with obvious repugnance and trepidation.

It seems that there was one part of the ancient land—the first part that ever rose from the waters after the earth had flung off the moon and the Old Ones had seeped down from the stars—which had come to be shunned as vaguely and namelessly evil. Cities built there had crumbled before their time, and had been found suddenly deserted.

Then when the first great earth buckling had convulsed the region in the Comanchean Age, a frightful line of peaks had shot suddenly up amidst the most appalling din and chaos—and earth had received her loftiest and most terrible mountains.

If the scale of the carvings was correct, these abhorred things must have been much over forty thousand feet high—radically vaster than even the shocking mountains of madness we had crossed. They extended, it appeared, from about Latitude 77°, E. Longitude 70° to Latitude 70°, E. Longitude 100°—less than three hundred miles away from the dead city, so that we would have spied their dreaded summits in the dim western distance had it not been for that vague, opalescent haze. Their northern end must likewise be visible from the long antarctic circle coast line at Queen Mary Land.

Some of the Old Ones, in the decadent days, had made strange prayers to those mountains—but none ever went near them or dared to guess what lay beyond. No human eye had ever seen them, and as I studied the emotions conveyed in the carvings I prayed that none ever might.

There are protecting hills along the coast beyond them—Queen Mary and Kaiser Wilhelm Lands—and I thank Heaven no one has been able to land and climb those hills. I am not as sceptical about old tales and fears as I

used to be, and I do not laugh now at the prehuman sculptor's notion that lightning paused meaningfully now and then at each of the brooding crests, and that an unexplained glow shone from one of those terrible pinnacles all through the long polar night. There may be a very real and very monstrous meaning in the old Pnakotic whispers about Kadath in the Cold Waste.

But the terrain close at hand was hardly less strange, even if less namelessly accursed. Soon after the founding of the city the great mountain range became the seat of the principal temples, and many carvings showed what grotesque and fantastic towers had pierced the sky where now we saw only the curiously clinging cubes and ramparts.

In the course of ages the caves had appeared, and had been shaped into adjuncts of the temples. With the advance of still later epochs all the limestone veins of the region were hollowed out by ground waters, so that the mountains, the foothills, and the plains below them were a veritable network of connected caverns and galleries. Many graphic sculptures told of explorations deep underground, and of the final discovery of the Stygian sunless sea that lurked at earth's bowels.

THIS vast nighted gulf had undoubtedly been worn by the great river which flowed down from the nameless and horrible westward mountains, and which had formerly turned at the base of the Old Ones' range and flowed beside that chain into the Indian Ocean between Budd and Totten Lands on Wilkes's coast line. Little by little it had eaten away the limestone hill base at its turning, till at last its sapping currents reached the caverns of the ground waters and joined with them in digging a deeper abyss.

Finally its whole bulk emptied into the hollow hills and left the old bed toward the ocean dry. Much of the later city as we now found it had been built over that former bed. The Old Ones, understanding what had happened, and exercising their always keen artistic sense, had carved into ornate pylons those headlands of the foothills where the great stream began its descent into eternal darkness.

This river, once crossed by scores of noble stone bridges, was plainly the one whose extinct course we had seen in our aëroplane survey. Its position in different carvings of the city helped us to orient ourselves to the scene as it had been at various stages of the region's age-long, æon-dead history, so that we were able to sketch a hasty but careful map of the salient features—squares, important buildings, and the like—for guidance in further explorations.

We could soon reconstruct in fancy the whole stupendous thing as it was a million or ten million or fifty million years ago, for the sculptures told us exactly what the buildings and mountains and squares and suburbs and landscape setting and luxuriant Tertiary vegetation had looked like.

It must have had a marvelous and mystic beauty, and as I thought of it I almost forgot the clammy sense of sinister oppression with which the city's inhuman age and massiveness and deadness and remoteness and glacial twilight had choked and weighed on my spirit.

Yet, according to certain carvings the denizens of that city had themselves known the clutch of oppressive terror; for there was a somber and recurrent type of scene in which the Old Ones were shown in the act of recoiling affrightedly from some object—never allowed to appear in the design—found in the great river and indicated as having been washed down through waving, vine-draped cycad forests from those horrible westward mountains.

It was only in the one late-built house with the decadent carvings that we ob-

tained any foreshadowing of the final calamity leading to the city's desertion. Undoubtedly there must have been many sculptures of the same age elsewhere, even allowing for the slackened energies and aspirations of a stressful and uncertain period; indeed, very certain evidence of the existence of others came to us shortly afterward. But this was the first and only set we directly encountered.

We meant to look farther later on; but as I have said, immediate conditions dictated another present objective. There would, though, have been a limit —for after all hope of a long future occupancy of the place had perished among the Old Ones, there could not but have been a complete cessation of mural decoration. The ultimate blow, of course, was the coming of the great cold which once held most of the earth in thrall, and which has never departed from the ill-fated poles—the great cold that, at the world's other extremity, put an end to the fabled lands of Lomar and Hyperborea.

Just when this tendency began in the antarctic it would be hard to say in terms of exact years. Nowadays we set the beginning of the general glacial periods at a distance of about five hundred thousand years from the present, but at the poles the terrible scourge must have commenced much earlier. All quantitative estimates are partly guesswork, but it is quite likely that the decadent sculptures were made considerably less than a million years ago, and that the actual desertion of the city was complete long before the conventional opening of the Pleistocene—five hundred thousand years ago—as reckoned in terms of the earth's whole surface.

IN THE decadent sculptures there were signs of thinner vegetation everywhere, and of a decreased country life on the part of the Old Ones. Heating devices were shown in the houses, and winter travelers were represented as muffled in protective fabrics. Then we saw a series of cartouches—the continuous band arrangement being frequently interrupted in these late carvings—depicting a constantly growing migration to the nearest refuges of greater warmth—some fleeing to cities under the sea off the far-away coast, and some clambering down through networks of limestone caverns in the hollow hills to the neighboring black abyss of subterrane waters.

In the end, it seems to have been the neighboring abyss which received the greatest colonization. This was partly due, no doubt, to the traditional sacredness of this special region, but may have been more conclusively determined by the opportunities it gave for continuing the use of the great temples on the honeycombed mountains, and for retaining the vast land city as a place of summer residence and base of communication with various mines.

The linkage of old and new abodes was made more effective by means of several gradings and improvements along the connecting routes, including the chiseling of numerous direct tunnels from the ancient metropolis to the black abyss—sharply down-pointing tunnels whose mouths we carefully drew, according to our most thoughtful estimates, on the guide map we were compiling.

It was obvious that at least two of these tunnels lay within a reasonable exploring distance of where we were—both being on the mountainward edge of the city, one less than a quarter of a mile toward the ancient rivercourse, and the other perhaps twice that distance in the opposite direction.

The abyss, it seems, had shelving shores of dry land at certain places, but the Old Ones built their new city under water—no doubt because of its greater certainty of uniform warmth. The depth of the hidden sea appears to have

been very great, so that the earth's internal heat could insure its habitability for an indefinite period.

The beings seem to have had no trouble in adapting themselves to part-time—and eventually, of course, whole-time—residence under water, since they had never allowed their gill systems to atrophy.

There were many sculptures which showed how they had always frequently visited their submarine kinsfolk elsewhere, and how they had habitually bathed on the deep bottom of their great river. The darkness of inner earth could likewise have been no deterrent to a race accustomed to long antarctic nights.

Decadent though their style undoubtedly was, these latest carvings had a truly epic quality where they told of the building of the new city in the cavern sea. The Old Ones had gone about it scientifically—quarrying insoluble rocks from the heart of the honeycombed mountains, and employing expert workers from the nearest submarine city to perform the construction according to the best methods.

These workers brought with them all that was necessary to establish the new venture—Shoggoth tissue from which to breed stone lifters and subsequent beasts of burden for the cavern city, and other protoplasmic matter to mold into phosphorescent organisms for lighting purposes.

AT LAST a mighty metropolis rose on the bottom of that Stygian sea, its architecture much like that of the city above, and its workmanship displaying relatively little decadence because of the precise mathematical element inherent in building operations.

The newly bred Shoggoths grew to enormous size and singular intelligence, and were represented as taking and executing orders with marvelous quickness. They seemed to converse with the Old Ones by mimicking their voices—a sort of musical piping over a wide range, if poor Lake's dissection had indicated aright—and to work more from spoken commands than from hypnotic suggestions as in earlier times.

They were, however, kept in admirable control. The phosphorescent organisms supplied light with vast effectiveness, and doubtless atoned for the loss of the familiar polar auroras of the outer-world night.

Art and decoration were pursued, though, of course, with a certain decadence. The Old Ones seemed to realize this falling off themselves, and in many cases anticipated the policy of Constantine the Great by transplanting especially fine blocks of ancient carving from their land city, just as the emperor, in a similar age of decline, stripped Greece and Asia of their finest art to give his new Byzantine capital greater splendors than its own people could create. That the transfer of sculptured blocks had not been more extensive, was doubtless owing to the fact that the land city was not at first wholly abandoned.

By the time total abandonment did occur—and it surely must have occurred before the polar Pleistocene was far advanced—the Old Ones had perhaps become satisfied with their decadent art—or had ceased to recognize the superior merit of the older carvings. At any rate, the æon-silent ruins around us had certainly undergone no wholesale sculptural denudation, though all the best separate statues, like other movables, had been taken away.

The decadent cartouches and dados telling this story were, as I have said, the latest we could find in our limited search. They left us with a picture of the Old Ones shuttling back and forth betwixt the land city in summer and the sea-cavern city in winter, and sometimes trading with the sea-bottom cities off the antarctic coast.

By this time the ultimate doom of the land city must have been recognized, for the sculptures showed many signs of the cold's malign encroachments. Vegetation was declining, and the terrible snows of the winter no longer melted completely even in midsummer.

The saurian live stock were nearly all dead, and the mammals were standing it none too well. To keep on with the work of the upper world it had become necessary to adapt some of the amorphous and curiously cold-resistant Shoggoths to land life—a thing the Old Ones had formerly been reluctant to do. The great river was now lifeless, and the upper sea had lost most of its denizens except the seals and whales. All the birds had flown away, save only the great, grotesque penguins.

What had happened afterward we could only guess. How long had the new sea-cavern city survived? Was it still down there, a stony corpse in eternal blackness? Had the subterranean waters frozen at last? To what fate had the ocean-bottom cities of the outer world been delivered? Had any of the Old Ones shifted north ahead of the creeping ice cap? Existing geology shows no trace of their presence. Had the frightful Mi-Go been still a menace in the outer land world of the north? Could one be sure of what might or might not linger, even to this day, in the lightless and unplumbed abysses of earth's deepest water?

Those things had seemingly been able to withstand any amount of pressure—and men of the sea have fished up curious objects at times. And has the killer-whale theory really explained the savage and mysterious scars on antarctic seals noticed a generation ago by Borchgrevingk?

The specimens found by poor Lake did not enter into these guesses, for their geologic setting proved them to have lived at what must have been a very early date in the land city's history. They were, according to their location, certainly not less than thirty million years old, and we reflected that in their day the sea-cavern city, and indeed the cavern itself, had had no existence.

They would have remembered an older scene, with lush Tertiary vegetation everywhere, a younger land city of flourishing arts around them, and a great river sweeping northward along the base of the mighty mountains toward a far-away tropic ocean.

And yet we could not help thinking about these specimens—especially about the eight perfect ones that were missing from Lake's hideously ravaged camp. There was something abnormal about that whole business—the strange things we had tried so hard to lay to somebody's madness—those frightful graves—the amount *and nature* of the missing material—Gedney—the unearthly toughness of those archaic monstrosities, and the queer vital freaks the sculptures now showed the race to have —— Danforth and I had seen a good deal in the last few hours, and were prepared to believe and keep silent about many appalling and incredible secrets of primal nature.

TO BE CONCLUDED.

This magnificent picture of strange civilization comes to a surprising climax next month. Don't miss it.

Scientific Observations!

Dear Editor:

To me, the most fascinating story in the December issue was *The Mad Moon* by Weinbaum. I sincerely hope it will be one of a series on the same theme, indeed, a continuation of the same story. The living characters—to say nothing of the terrain—are so intensely interesting.

The strange behavior of the loonies can be studied much further profitably, for the benefit of Ionian biologists, as comparatively little is known about these silly, unbalanced but withal, harmless and friendly creatures. It is said that their mental reactions are a kind of history of their degeneration from a former high estate.

For lovers of pets, too, more study of the intelligence of the parcat—Felis Ionis Parlatus—would be amusing as well as profitable. It is generally thought that this gentle, three-legged, mimicking beast is as dumb as the Earth parrot in the repetition of sounds, but, according to the Universal Encyclopedia, this is a gross maligning of the animal's intelligence.

Those who read the story will remember that many of its words seemed silly repetitions of sounds it had picked up, yet closer examination will show that though its words are not used in the exact English or literal sense, they are associated with appropriate situations.

Observe that when the parcat stepped forth from the rocket plane, a most unexpected event in the story, it repeated the phrase which it had picked up on the observation of another unexpected event: "I'm real and you're real." The association of ideas was thus: "Any amazing, but incontrovertible fact is expressed by the words 'I'm real and you're real.'"

This little animal is affectionate and loyal, in its feline way, to loonies or men—whoever may care for it—and while its intelligence is not generally comparable to that of slinkers, it has been frequently known to outwit the latter, who are the common enemy.

I sincerely trust that Mr. Weinbaum will continue these highly instructive little stories, as they serve to acquaint the general public with the most unusual flora and fauna of Io and their odd, semiearthly, psychological reaction to situations.—Armand B. Coigne, Box 45, Station D, New York, N. Y.

Including Advice!

Dear Editor:

Whatever course you decide to take, in regard to your pending decision of future policy, do be firm with your authors, and insist that stories be well-written, and developed with originality. It is not so much whether the plot of a tale is absolutely new, as whether the treatment of it is different. And no story, no matter how original or startling in its conceptions is worthy of your magazine unless it is written to the best of that author's ability. Sometimes, even not then.

Some critics have asserted that science-fiction is read, for the most part, by high-school children. Whether or not that is true makes little difference upon your literary standards. As a matter of fact, you will find that high-school kids demand a much higher style of literature than most adults.

As to your editorial yardstick, the best rule, to my way of thinking, is to have no rule. You know, or at least have a good idea, of what is good science-fiction; then every story that strikes you as being worth printing, will likewise appear the same to the majority of your readers. And when you do have a rule, you can't help but start measuring stories by your set standards, rather than by their merits.

Many tales which might fit an editorial yardstick to perfection would be far better in the wastebasket, and, conversely, there are a goodly crop of fine tales which could not fit any given standard. Try for balance, and let it go at that. Variety is the spice of science-fiction as well as of everything else.

To be a little more specific, try to visualize each story as written five years from now, and whether it would be worth reading then. If a story is one that presents enough human interest to make it as enjoyable in 1940 as it is now, then it is good. But if all it has to say for itself is a bit of exciting adventure with fantastic settings, then it may as well return to the writer. Science-fiction has, too long, been typed. A certain magazine used to run a streamer on its cover, reading, "Adventures of Future Science." The only stories printed under that policy which are being read to-day are those which were more than merely what the streamer indicated.

For example: *Ships That Come Back* will be as alive in five years as it was last month. Why? Because five years from now there will still be men like Captain Robey who sacrifice everything to a soulless ideal—a shadowy god called duty. *I Am Not God* will not be forgotten quickly, because, for many years to come, there will be men who long to take the world in their own hands and make it over.

On the other hand, what has *Islands of the Sun* when the excitement dies down? Nothing. Some may remember the ideas in it, but the story itself won't last. On the other hand, the *Legion of Space* will be recalled indefinitely because what reader hasn't known and loved Giles Habibula? You have known him. I have known him—not on the Moon, nor by that name—but perhaps right at home or across the street.

Finally, I want to answer Miss Mildred Gifford. I agree with her to the letter. As a matter of fact, my little piece was meant for a bit of sarcasm on readers, myself included, who raise the very devil over such side issues as covers, illustrations, and the editor answering letters in the columns. I feel that too much valuable space has been, and is still being wasted in Brass Tacks upon these things.

The readers have it in their power to make science-fiction what it should be by writing their ideas to these columns, and instead they pen reams of tripe about covers, edges, staples, illustrations, and silly societies. A little humor now and then is just fine. In fact, I would favor one long letter each issue burlesquing the many failings of science-fiction, science-fiction magazines, and science-fiction readers. But to fill the entire section with this and a lovely list of all the recent stories with their individual gradings—phooey! (To those who don't like slang, may I suggest that, like silence, it is most expressive.) If readers really must have it, then why not tell us each issue just which stories and illustrations were rated highest and lowest in the one before last?

Now, after all this, it would be quite puerile of me to say that I am dancing on the moonbeams over the return of H. W. Wesso, think your new cover for the January, 1936, issue is the best I've seen in years, enjoy immensely your wide variety of artists in the new issues, and still wish you would answer the reader's letters in the columns—yes, it would be quite infantile—so I don't think I'll mention it.—Robert W. Lowndes, Box 353, Springdale, Conn.

Wesso Saves It!

Dear Editor:

Taking the December Astounding Stories into consideration, I think that the issue is bad, terrible, and putrid.

Starting with the cover, it was a horrible conglomeration of out-of-proportion figures and is the worst cover we have ever had.

Davy Jones' Ambassador was merely fair-minus. The good writing could not balance the senile plot.

Concerning *Nova Solis*, I would advise the author to learn something about astronomy before attempting to write such a story.

The Green Doom was the worst hackneyed drivel that I have ever read in a science-fiction magazine. Phooey to all "death clouds" from now on.

Mad Moon was fairly good.

Human Machines was rotten, terrible, odoriferous, and awful. My, how Haggard has deteriorated!

The Fourth-Dimensional Demonstrator was the only halfway decent story in the magazine, but was too scientifically illogical for me to fully appreciate it. Its amusing qualities, however, made it readable.

Avalanche was fair. Nothing superior about it.

Science-fiction must be in a rut if you spring stories like *Forbidden Light* upon us poor, unsuspecting readers.

As a whole, the issue was terribly punk, although I haven't read *Blue Magic*.

Probably the only bright light upon the horizon is the return of Wesso. Three cheers for one of the best science-fiction artists. I shall never stop yelling until I see a cover by him.

Hoping for a much better issue next time.—Raymond Peel Mariella, 5227 Chancellor Street, Philadelphia, Pa.

Weinbaum Is Tops!

Dear Editor:

I have made up my mind to write you a letter every month; whether they are printed or not makes no great difference to me.

After receiving and reading the January Astounding Stories. I must say that that issue was one heck of a way to begin the new year. It was a poorer magazine than any of the 1935 ones. Here are the stories in order of their quality: *The Isotope Men*, Schachner; *Strange City*, Van Lorne; *Stranger From Fomalhaut*, Kruse; *Smothered Seas*, Weinbaum-Farley; *Laboratory Coöperator 3*, Bowman; *Moon Crystals*, Haggard.

The first-mentioned story was really one of Schachner's best. Please tell Ralph Milne Farley to let Stanley G. Weinbaum alone: *Smothered Seas* was the first Weinbaum yarn that I did not especially care for. Weinbaum's other creations are all tops as far as I'm concerned.

Moon Crystals was strongly reminiscent of Weinbaum's *The Mad Moon* in the December issue, but it was very inferior to the latter story.

As I have only been reading science-fiction for about two and one half years, I had never seen any of Wesso's work before I saw the January magazine. Gosh, he's swell! When Dold—artist supreme—reënters the pages of Astounding, and if we still can keep Wesso, that'll be a real treat to lovers of good drawings. Marchioni is improving; with a few more illustrations like those in recent issues, he'll be able to be a candidate for the honored privilege of holding a candle to Dold.—Douglas Blakely, 4516 Edina Blvd., Minneapolis, Minn.

We Try to be Original!

Dear Editor:

Greetings to you and Brass Tacks! Again I shall bully and abuse you, but it is first necessary that I offer a little criticism, good and bad.

The artists shall be the first in line for my praise or my denouncement. Brown's monster is quite convincing, and I like it better than Marchioni's on the inside illustration.

The first two page piece by Dold is very good, and far ahead of the other illustrations in the December issue. Please find the printer who is careless and causes all those black illustrations. By a few simple adjustments he can make the impressions much lighter.

Davy Jones' Ambassador is excellent and humorous; it is well-handled and has a touch of humor that prevents a person from taking it seriously as a story and more as a humorous escapade through Mr. Welch's supersympathetic dream world.

Nova Solis is a fairly well-written story, mediocre, hashed and hacked in spots, but interesting. I suggest that the author try another type of science-fiction.

The Green Doom: Hash! Hash! Hash!

The Mad Moon: Weinbaum is a creative writer who turns out a good story each issue and has a sense of humor.

Human Machines, by Haggard, is up to standard. Let me add that he writes in a distinctive rhythmic style as though he were writing blank verse. His paragraphs have a beat and measure that I enjoy.

Blue Magic: hocus-pocus, hash!

The Fourth-Dimensional Demonstrator: Great stuff, light, humorous, and well written.

Avalanche: A mediocre story, not especially well written, but ahead of *Blue Magic.*

Forbidden Light: Boy, oh boy! What will Welch say about this hodgepodge of miraculous escapades and monsters?

No previous magazine has ever successfully decided the amount of science or romance in the stories. The same goes for adventure. Why? It is because of the vast differences of temperament of the readers.

Since you, in all your past editions have managed to present nine or more stories in each issue, each having two or three of these interests strongly noticeable in them, you have succeeded to a moderate degree. Since experimenting might prove expensive, I suggest that you stick to your present system and be satisfied to achieve a quiet success.

In my opinion, I think it would be a good idea to feature in each issue, or every other issue, at least, one unusual story—one that is foreign to your stock stuff. It makes no difference whether it is fantasy, science-fiction or weird, but make it original. Remember the element of surprise is pleasing to every one.

Make your heroes a little more human with a few of the faults of the rest of us. Most of your heroes are too consistently virtuous.

Is it not remarkable that Edington and Jeans cannot agree with each other and with Einstein upon many points? Mathematics are O. K., but just a little too plastic to be convincing. Scientific theories are supposed to be free from personalities. Yet the human factor enters in and the result is that the individuality reeks from the average savants theories the way butter reeks when spread by a fishy knife.

Nowadays it is becoming to have a fall and winter style for atomic models, as well as one for spring and summer. It is the old hocus-pocus that men have been kidding themselves about since the dawn of creation. Of course, there must be a beginning; whether any one of the dozen or so scientific theories of to-day will be that starting point, is a matter of speculation; surely all of them, especially those dealing with mass, energy and electron cannot be right. So don't go into a rage because a fellow succeeds in publishing a story in a pulp magazine that is inaccurate according to present-day concepts.

It seems that Welch, although he calls us morons, and other cute names, is mighty anxious to get into Brass Tacks with the rest of the moronic clan. Unfortunately, his criticism is excellent, although tainted by a grievance against the world. He is an amusing example of what the force of human vanity can accomplish. Some people shout from soap boxes to gain attention; Welch writes letters.

Yours for bigger and better science-fiction, and give Dold my best wishes for happier days. —Hubert Allcock, 295 Pine Street, Lyndhurst, N. J.

On the Whole, Favorable!

Dear Editor:

This is my first letter to Brass Tacks. I have been reading science-fiction for pretty nearly four years, but now I certainly thank the day that my friend presented me with a copy of your Astounding Stories magazine, for from that day to this and until the time of my departure I shall always enjoy reading your magazine. There is something about your magazine that makes it differ greatly from other so-called science-fiction magazines.

When I sit down to read it, I know that more and more powerful stories will be revealed as I turn the pages. At present, your magazine is the tops in science-fiction. You have set a pace that has put all other competitors in the past mode. I would certainly enjoy seeing Astounding Stories published in an annual or semiannual or quarterly edition, but as for publishing it semimonthly, maybe it wouldn't be so good. Your magazine is now running like a well-oiled machine, and to attempt such an overload, possible damage might result.

About your stories and illustrations: ninety-nine per cent of them carry a powerful kick. They take one from the everyday life and elevate one to the peak of satisfaction. My favorite authors are: Williamson, Binder, Weinbaum and John Taine.

I certainly enjoy your thought-variant stories. Let's have more of them. Your serial stories are great too but it is kind of hard on the poor reader who has to wait four or five months before completing soul-stirring tales. Your covers are what one would call super-realistic. Dold certainly has the essence of imaginary powers. He is great and so is Brown and Marchioni.

I would like to extend wishes to you for the best of luck for forthcoming issues of Astounding Stories and may they in the future surpass their present success. I would like to correspond with anybody between the ages of sixteen and twenty in the United States or any English-speaking country.—Tom Kerwin, 141 Philip Street, Albany, N. Y.

Plenty of Variety!

Dear Editor:

The editor's page this month is one of the most interesting so far. See that you live up to it. I think you have done pretty well up to now. Variety is the spice of life and there is plenty of variety in science-fiction.

The stories I liked, without question, in the January issue are:

The Isotope Men, by an author who, in my estimation, is one of the best in the science-fiction world today; well illustrated by Wesso.

Strange City, a well-written story; enjoyed it throughout.

Smothered Seas, if other collaborations by these authors are just as good, by all means let them continue to do it. Swell story.

Coöperator 3, one of those intriguing shorts you publish from time to time.

Blue Magic, good story of the type Astounding used to specialize in.

Stories that just don't click somehow: *Moon Crystals.* While reading this story, I got the impression that I had read it before. It was similar in style to one of Weinbaum's recent stories.

Stranger From Fomalhaut, interestingly written but not much to the plot.

Good cover by Brown, but I did not care for his inside work—never have. Marchioni, good. Dold, great. Thompson, fair.

Please, a little more modern type for the story headings.

That title block on the cover—bad.

What about some scientific detective stories?—Jack Darrow, 4224 N. Sawyer Avenue, Chicago, Ill.

Striking but Gaudy!

Dear Editor:

Your January cover is indeed striking but I think a little bit gaudy. I haven't read the stories yet as I just received it, but will during my vacation. Concerning the November issue, the cover is indeed beautiful, one of Brown's masterpieces. *The Red Peri* takes the cake. The way it ends calls for a series. Am I right?

The Adaptive Ultimate in my estimation is a close second. The last paragraph of *I Am Not God* made a thrill and chill go up and down my spine. This story is a typical Schachner moral yarn. Now a question: How about Keller? Why don't you include him?

Thanks a lot for reading this letter. I had to get a lot of things off my chest.—Seymour Dickman, 4325 Knox Place, Bronx, New York, N. Y.

More Sequels?

Dear Editor:

This seems to be a season to demand things of you. I will change the style and ask something.

How about more sequels? Surely you won't let the *Skylark* and *The Mightiest Machine* just drop out of sight into the dim past. Although you state that the sameness of stories would make the magazine monotonous, don't you think that enough time has passed to enable a story of that type to be appreciated again? You could maintain a balance in the same way that you did in the January issue, by printing different types of stories along with it.

Why can't some of the kickers be satisfied with the old Astounding? They know darn well that they would read it even if it were printed on tissue paper. It's the stories themselves that make a magazine. So why not point out the good points of the magazine instead of fussing about paper, binding, edges, etc.

I hope some of you readers will take heed of my plea and support me.—Lyle Dahlbam, 601 Benton Street, Rock Rapids, Iowa.

We Got Wellman!

Dear Editor:

May I horn in? Though this is my first letter to Brass Tacks, I have read Astounding for as long as I have read anything understandingly. Here and now I wish to say that staples, or glue, rough edges or anything, I'll continue to read Astounding as long as it is published and I have the price.

Science or adventure? Why not some of each? Balance your magazine nicely each month between the two kinds and use some stories splitting the emphasis between the two qualities. And, on that subject, I am with the many who clamor for the tried and true old-timers who are probably better than they ever were. I would be particularly pleased to see Ray Cummings, Clark Ashton Smith, R. F. Strazl, Manley Wade Wellman, S. Fowler Wright and many others. Not H. P. Lovecraft, as many have suggested. Good as Lovecraft is, even great, he writes pure and beautiful fantasy, not science-fiction.

In reference to the letter of Robert S. Pratt in the December issue, I, too, vote for the series, and especially for the Jan Van Tyren series by Raymond S. Gallun. His *Derelict* was dandy and I do not wonder that all the Oliver Twists are calling for more.

And Milton Rothman, in the same issue, came out with a good idea. He said, "Why don't authors get at least three new ideas before writing a story?" I think that the suggestion should be adopted and enforced. Of course, there may not be three new ideas under the sun, but it shouldn't be hard to find three that are as yet fresh and unfamiliar.—Lloyd Scott, 359 W. 22nd Street, New York, N. Y.

A New Objection!

Dear Editor:

Here goes the initial idiotic gibberings to the readers' page from a scientifictionists of many years standing. This hopeless case of scientifictionists has been the object of worried mutterings and completely nutty frowns by alleged friends for years.

Although I have tried rather half heartedly to inject some of my enthusiasm for science-fiction into my friends, I received for my pains such remarks as: "What? Read that trash? Not on your life! My opinion of people who will go for such things is not very high." I know exactly how a hotly pursued fugitive from justice feels. That haunted, guilty, hair-trigger-nerves feeling is mine completely, though my crime is nothing more than an insatiable desire for more and more science-fiction. I slink furtively to the nearest and most inconspicuous news stand, refuse all offers of aid in hunting out the science-fiction magazines, and beat a hasty retreat.

One of my pet mysteries is the title of the magazine. Why in the name of goodness don't you use a title on the cover that vaguely hints to the new reader the fact that science-fiction stories abide within its covers? Astounding! What does that word imply to you, other than the fact that Webster says the word means to confound or astound? Does it say anything about astounding scientifically? No! Why don't you take a readers' poll for a new name for Astounding? It should have a name with the word "science" in it.

I know that slick paper costs a lot of money and reflects glaring light into the eyes of the reader. I also know that slick paper stands the ravages of time, wear and binding much better than pulp. Any true and devoted science-fiction reader takes pardonable pride in stocking his library with the science-fiction he reads.

I have no comment to make, favorable or otherwise about your artists. If the author is worthy of the name he is able to paint with words a good description of each and every character in the story. Concentration on the cover page however, the place where a drawing does the most good, should always be carefully attended to by, in your own opinion, your best artist.

I add my puny cry for another masterpiece by Doc Keller. If that boy is as good a doctor as he is an author, then come on, eternal health! R. M. Johnson, Associated Press, Youngstown, Ohio.

So Many Sequels?

Dear Editor:

I just finished the January issue and it was swell. Congratulations on *Strange City*. It was one of the best stories that I have read in a long time. Let's have a sequel soon. Brown's cover for the story was good, too.

Moon Crystals could use a sequel, too. In fact, there have been several stories lately that need them—*Derelict, the Way of the Earth* and *The Red Peri*. *The Isotope Men* was interesting from a scientific viewpoint but not probable. I don't like it.

Will you please print a Skylark story? I have never read one of them. I agree with Robert Boelke about the publishing of serials in book form. You could go twice a month by reducing the price to fifteen cents and the number of pages to one hundred and forty-four, and sell as many copies twice a month. It is a lot easier to get fifteen cents twice a month than twenty cents once a month.—Robert Strasser, 316 Hunter Avenue, Dayton, Ohio.

The Good Old Days!

Dear Editor:

What ho! Do my eyes deceive me or is Wesso back where he belongs? Boy! It will certainly seem like the good old days! He sure used to do some good illustrating. With both Dold and Wesso your magazine will sure rate tops. I certainly hope Dold's sickness will not keep him from illustrating.

And by the way, I do agree with all these fellows who are howling for a quarterly. Come on, editor, loosen up. Don't you think it about time you gave us the long-awaited quarterly? Can't you see how fiendishly you are torturing your loyal followers? Can't you see how you deprive us of our chief source of enjoyment?—P. L. Lewis, 126 South Cedar Street, Glendale, California.

Brass Tacks Gets Questions Answered!

Dear Editor:

I have just purchased the January issue and it looks as if it will be O. K. I haven't had time to read anything yet except Brass Tacks which is an endless story in itself.

Hurray for Wesso! Keep him! Let Dold or Brown take the covers. You have four good

artists: Dold, Brown, Marchioni, and Wesso. The magazine is improving steadily, but I will not say that it is my favorite. Keep up the good work, though, and I will keep on reading it.

Why can't we have a department of questions and answers? If not that, can't we at least have a questionnaire on the facts in the stories? I know that you have a large amount of letters to print each month, but just the same, couldn't you use some other kind of type in Brass Tacks?

For heaven's sake, get shorter serials. A three-part serial is long enough, but more than that is too much. Put out a quarterly with a couple of long stories in it. That would be much better.—Roy Test, Jr., 325 East 68th Street, Los Angeles, California.

From Cover to Cover!

Dear Editor:

Please accept a revised supplement of criticism.

January issue: The cover, a good subject, well made up. The red block is too large. This cover is much superior to the December one, which I did not like.

The editorial. I am glad to hear that Lovecraft is to appear among our authors. I eagerly await his story.

The interior illustrations. Please do away quietly with the artist who illustrated *Smothered Seas*. Terrible. The illustration for *Moon Crystals* is fair but it looks out of place in a science-fiction magazine. Schneeman is slightly superior. At last Marchioni has turned out a good job on *Strange City*. Congratulations! I am pleased to see that you have one of the old masters—H. Wesso. His work is good, needless to say. And Dold is still at his best.

There are no outstanding stories in this issue but I remember most vividly *Smothered Seas*, and *Strange City*, also the short *Laboratory Co-operator 3*. The others are interesting, although I am sorry to say that *Blue Magic* is rather dragging along.

In line with your policy of "stories as foils for stories" I hope that as soon as the Lovecraft serial is finished we may have another story of superscience by one of the master authors. Two good authors whom I do not see in your pages are: P. Schuyler Miller and Harl Vincent.

A brief comment on the December issue: I will remember longest *Fourth-Dimensional Demonstrator*. The remainder will fade with time. *Forbidden Light* was slightly out of the class of our magazine.

If you follow the suggestion of several of the readers and bring out some of the better science-fiction novels in book form I wish you would reprint Merritt's *Moon Pool*.—L. M. Jensen, Box Number 35, Cowley, Wyoming.

Selects the Nine Best!

Dear Editor:

I don't write so very often, so naturally it takes me a little longer to speak my piece, but I'll try to make it as brief as possible.

I pick as the nine best stories published in the last five issues up to and including the January issue: *I Am Not God, Derelict, Intra Planetary, Islands of the Sun, Adaptive Ultimate, Fruit of the Moon Weed, The Mad Moon, Greater Glories*, and *The Isotope Men*.

In my opinion, you are too optimistic if you really expect the readers to give reasons why they like stories. There are only two main essentials in writing: good plot, which explains itself, although some authors can dress up old plots until you can't see the wrinkles, and well-drawn characters, natural and interesting conversation, and making improbable situations seem reasonable. I don't care whether the hero is zapping loonies or moving planets so long as he is doing it naturally.

I would select *The Isotope Men* and *Intra Planetary* as good plot stories. *I Am Not God* and *Derelict* were well-written stories, and *Greater Glories* was a pleasing combination.

I hate to hear readers say that you have a monopoly on good science-fiction. You haven't; you're the best, and we'll let it go at that.

H. H. Welch is too obviously fishing for enraged replies. Welch, as one syntonic individual to another, "Know thyself." Your defense reaction is working overtime.

One more thing. I had a faint twinge when I read your editorial in the September issue, wherein you mentioned with pride your British readers. I am not prejudiced against the British, but another science-fiction magazine has adopted a sickening attitude of servility toward British readers. It's silly to rave about something that hasn't happened and probably won't happen, but "an ounce of prevention etc."—Jack C. Campbell, Buchanan, Kentucky.

Review!

Dear Editor:

The stories I liked best in the last six or seven issues are: *Son of Old Faithful, Brain Leeches, Liquid Power, The Galactic Circle, Man of Iron, The Phantom Dictator, The Blue Infinity, Islands of the Sun, I Am Not God, Night, Derelict, The Red Peri, Blue Magic, The Lichen From Eros, Forbidden Light, Strange City, The Isotone Men*.

Tell Wesso he is great—the same for the other artists except Marchioni and Brown. Marchioni's drawings are too stiff, while Brown is only good for a cover.—James Taurasi, 137-07 32nd Avenue, Flushing, Long Island.

A Favorable Pat!

Dear Editor:

Congratulations on your August issue! It was a whamditty! I sure was glad to see Jack Williamson back! And Schachner's serial was as good as the original one.

I suppose I'm getting rather mushy now, but after the numerous kickings practiced by many of the readers I suppose a little pat on the back is welcome at times! So I'll say this! You've got the best magazine on the market!—Steve Heckett, 1139 S. 6th St., Terre Haute, Ind.

Illusion of Reality!

Dear Editor:

In line with the opinions of Al and Camille a reader of science-fiction would like to say amen!

You must know, Mr. Editor, that true fantasy stories of high caliber always weave credibility and realism into their theme, so as to create an illusion of reality! Please change your policy to the above and let your authors develop an artistic style. Why, I believe you'd even refuse A. Merritt admission to your pages on the grounds that he doesn't have enough science in his stories! How often do we intelligent readers tell you that we don't buy your magazine for a scientific treatise but for entertainment?

I am a radio broadcast operator and wouldn't think of turning to your pages for the latest in radio theory or application. You know that the science in your stories is the driest rot in print to-day, and all of it, if any is true at all, is given a false twist to prove, an end accepted as impossible on the very nature of your stories. Wasted time and hot air! Sure, you print some stories that fill this definition but you admit the others. If you don't want to change your policy, then print another magazine with that as the policy. But not just plain blood and thunder; that is the other extreme!—Fred C. Favre, 1466 Astor Ave., Bronx, N. Y.

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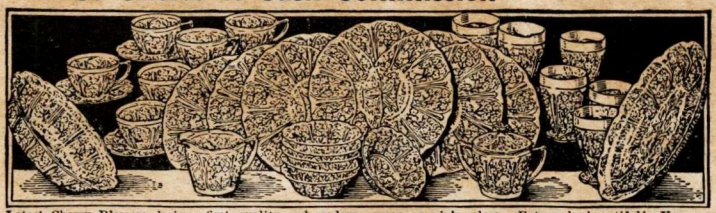

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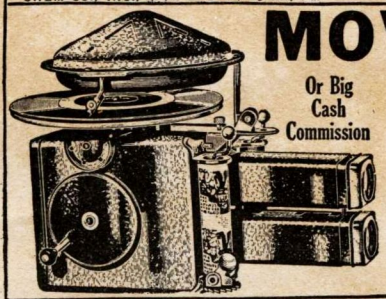

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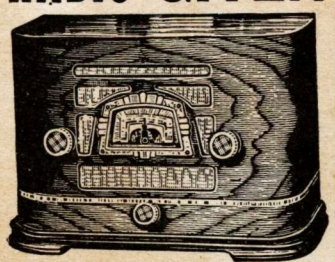

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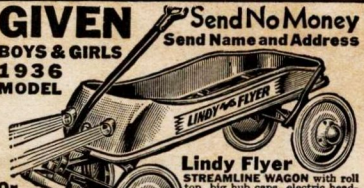

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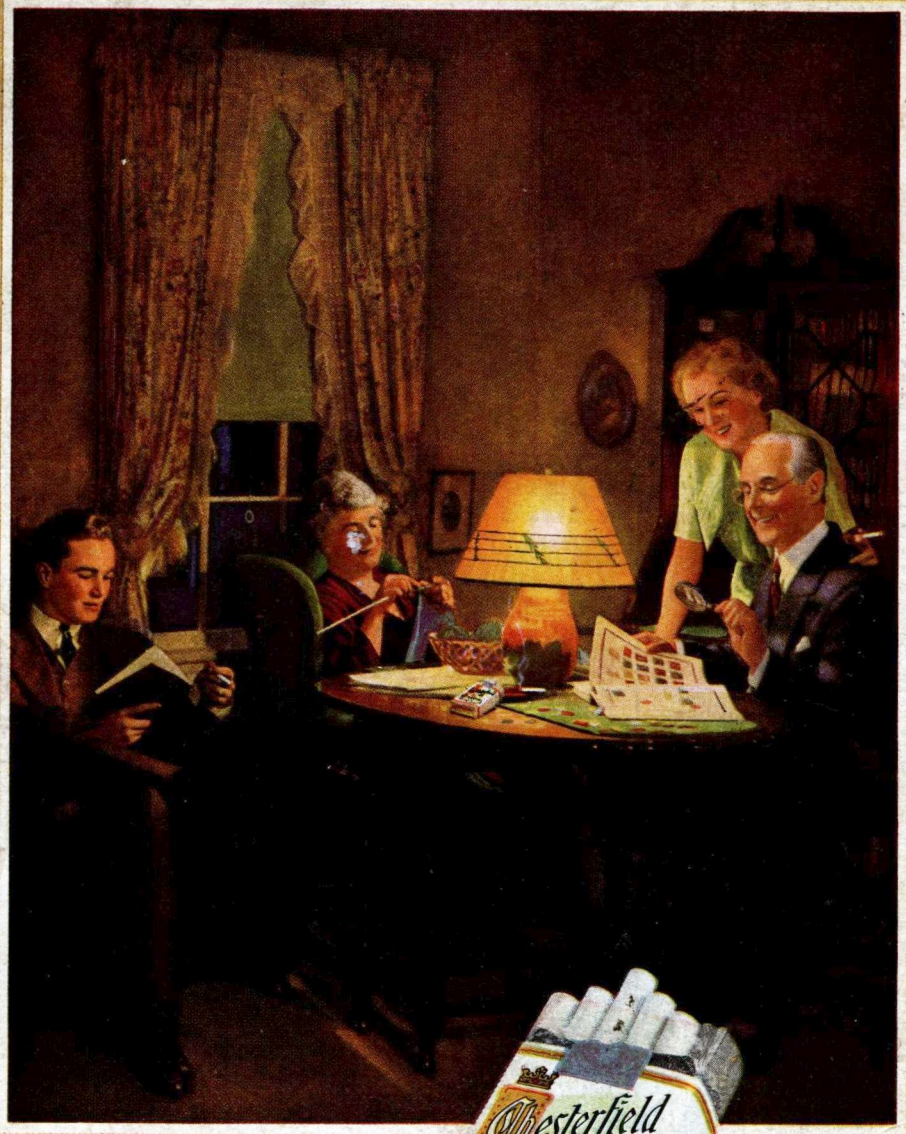

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