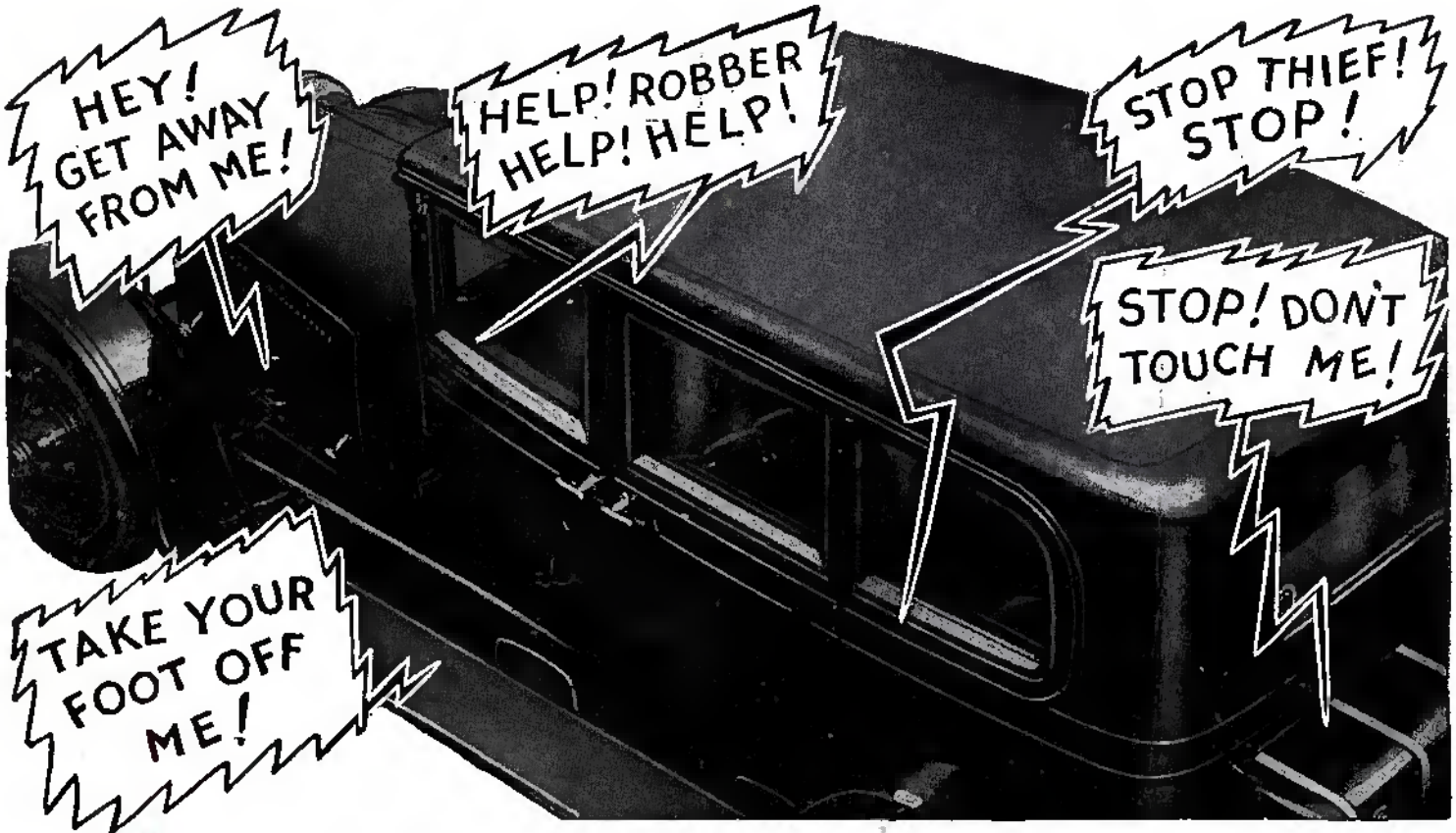
OCTOBER

AMAZING STORIES

SKYLARK THREE
By EDWARD E. SMITH, Ph.D.

Other Scientifiction Stories by
OTIS ADELBERT KLINE
EDMOND HAMILTON
L. TAYLOR HANSEN



Astonishing Electrical Invention

Protects Your Car from Thieves

...Automatically!

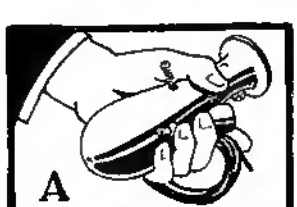
This unquestionably is the queerest, most incredible invention since the first discoveries of radio! A magical, shouting, automatic watchman that actually is far more than human! Never sleeps, rests or gets tired! Stands guard over your entire car from spare tire to headlights and steering wheel! Endorsed by police! Approved by Motor Association! Now offered on generous 5-day free test basis! The coupon brings full details.

A Startling Uncanny Money Maker for Agents

"WHAT makes it work?" "Where on earth did you get it?" "Bet you five dollars he's got some one hiding in there!" "It simply can't be true." A running fire of comment like this breaks out whenever and wherever this new invention is exhibited. And why not? When no one ever heard of such a startling, uncanny device before! In fact few people would even dare to dream there could be such a thing! So this, men, is something really NEW, something to grip the imagination of everyone, something that sells to every autoist on sheer novelty alone. Distributors, "star" salesmen, every man who wants to double and treble his present income should note carefully the following facts.

The Secret of a Theft-Proof Car

Now in this amazing new way, every car can be protected from theft for 24 full hours a day. In the garage or parked on the street, if any thief so much as pulls at your spare tire or touches his foot to your running board—ZOWIE! A riot of noise starts instantly! And your car never shuts up till the thief leaves. And listen to this. Even if the thief is wise to what's up, you alone place the secret control button anywhere you want it around the car. The thief can't possibly find it. If he wastes time looking for it—Bingo! He's caught and on his way to jail! This astonishing invention guards your spare-tire, headlights and spot-lights as well as the car itself.



A Mere Handfull

Note the tiny size of this amazing invention in the above picture. The switch, wire and sealed tube containing the "activator" is all there is to it. The entire cost is scarcely more than an ordinary radio tube! Test it. Mail the coupon today.

Installed in 10 Minutes—Costs Nothing to Operate

The inventor has asked the U. S. Government to protect his patent rights on this revolutionary discovery. Because of its uncanny powers and to distinguish it from everything else on earth this queer discovery is now called "Devil Dog."

Among its amazing features is the fact that it can be installed by anyone in 10 minutes or less. There is absolutely no cost for operation. It will last as long as the car. Fits any car from Ford to Rolls Royce without adjustment or fussing.

For introductory purposes a special 5-day test offer is now being made. If you are interested in learning about the most astonishing invention since the radio first came in, use the coupon at once. If your present income is less than $50 a week, the profit possibilities as our agent may astonish you. The coupon brings details of all offers. Mail it now.

NORTHWEST ELECTRIC CORP.
Dept. P-580 Pukwana, So. Dakota

AUTOMATIC DEVIL DOG

NORTHWEST ELECTRIC CORP.
Dept. P-580
Pukwana, So. Dakota

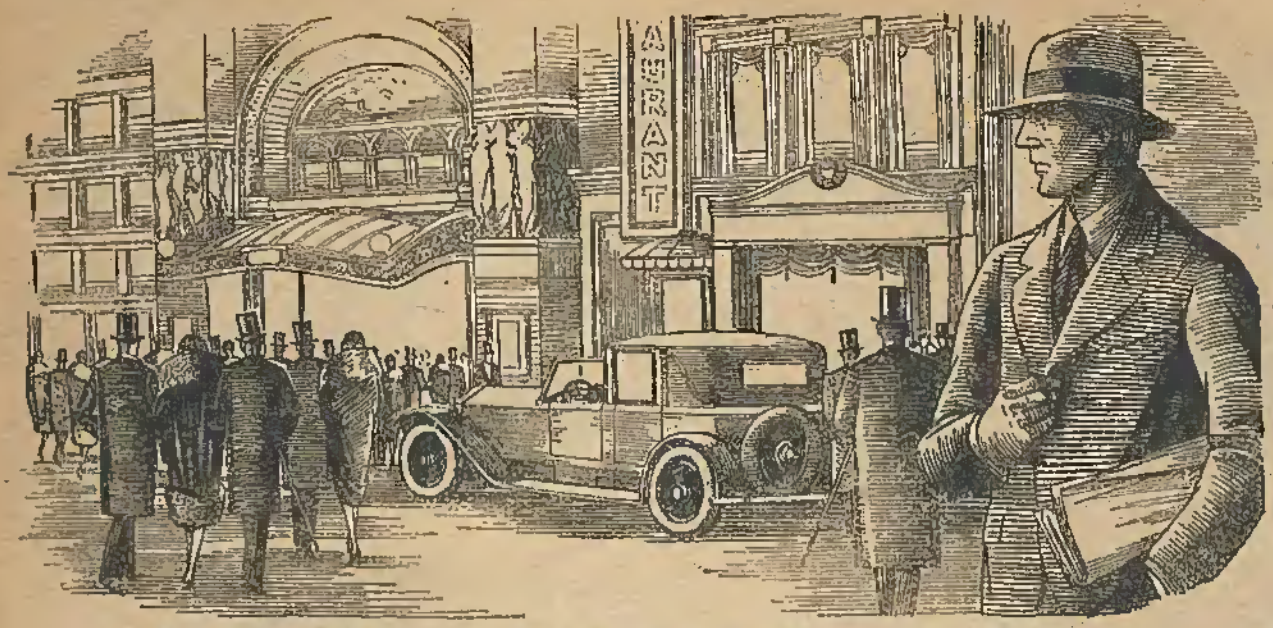
Rush details of your big 5-day test offer and big profits for agents.

Name.....

Address.....

Town..... State.....

☐ Check here if interested only in one for your own car and not in agents' money-making offer.



Always outside of things—that's where I was just twelve short months ago. I just didn't have the cash, that was all. No theatres, no parties, no good restaurants. No real enjoyment of life. I was just getting by, just existing. What a difference today! I drive my own car, have a good bank account, enjoy all the amusements I please.

I Couldn't Get the Good Things of Life

Then I Quit My Job and "Found" Myself!

HOW does a man go about making more money? If I asked myself that question once, I asked it a hundred times!

I know the answer now—you bet. I know the way good money is made, and I'm making it. Gone forever are the days of cheap shoes, cheap clothes, walking home to save carfare, pinching pennies to make my salary last from one pay-day to the next one. I own one of the finest Radio stores you ever saw, and I get almost all the Radio service and repair work in town. The other Radio dealers send their hard jobs to me, so you can see how I stand in my line.

But—it's just a year ago that I was a poorly paid clerk. I was struggling along on a starvation salary until by accident my eyes were opened and I saw just what was the matter with me. Here's the story of just how it happened.

One of the big moments of my life had come. I had just popped the fatal question, and Louise said, "Yes!"

Louise wanted to go in and tell her father about it right away, so we did. He sort of grunted when we told him the news, and asked Louise to leave us alone. And, my heart began to sink as I looked at his face.

"So you and Louise have decided to get married," he said to me when we were alone. "Well, Bill, just listen to me. I've watched you often here at the house with Louise and I think you are a pretty good, upstanding young fellow. I knew your father and mother, and you've always had a good reputation here, too. But let me ask you just one question—how much do you make?"

"Twenty-eight a week," I told him.

He didn't say a word—just wrote it down on a piece of paper.

"Have you any prospects of a better job or a good raise some time soon?" he asked.

"No, sir; I can't honestly say that I have," I admitted. "I'm looking for something better all the time, though."

"Looking, eh? How do you go about it?"

Well, that question stopped me.

How did I? I was willing to take a better job if I saw the chance all right, but I certainly had laid no plans to make such a job for myself. When he saw my confusion he grunted. "I thought so," he said. Then he held up some figures he'd been scribbling at.

"I've just been figuring out your family budget, Bill, for a salary of twenty-eight a week. I've figured it several ways, so you can take your pick of the one you like best. Here's Budget No. 1: I figure you can afford a very small unfurnished apartment, make your payments on enough plain, inexpensive furniture to fix such an apartment up, pay your electricity, gas and water bills, buy just about one modest outfit of clothes for both of you once each year, and save three dollars a week for sickness, insurance, and emergencies. But you can't eat. And you'll have to go without amusements until you can get a good, substantial raise in salary."

I began to turn red as fire.

"That budget isn't so good after all," he said, glancing at me; "maybe Budget No. 2 will sound better——"

"That's enough, Mr. Sullivan," I said. "Have a heart. I can see things pretty clearly now; things I was kidding myself about before. Let me go home and think this over." And home I went, my mind in a whirl.

At home I turned the problem over and over in my mind. I'd popped the question at Louise on impulse without thinking it out. Everything Mr. Sullivan had said was gospel truth. I couldn't see anything to do, any way to turn. But I had to have more money.

I began to thumb the pages of a magazine which lay on the table beside me. Suddenly an advertisement seemed almost to leap out at my eyes, an advertisement telling of big opportunities for trained men to succeed in the great new Radio field. With the advertisement was a coupon offering a big free book full of information. I sent the coupon in, and in a few days received a handsome 64-page book, printed in two colors, telling all about the opportunities in the Radio field and how a man can prepare quickly and easily at home to take advantage of these opportunities. I read the book carefully, and when I finished it I made my decision.

What's happened in the twelve months since that day seems almost like a dream to me now. For ten of those twelve months I've had a Radio business of my own! At first, of course, I started it as a little proposition on the side, under the guidance of the National Radio Institute, the institution that gave me my Radio training. It wasn't long before I was getting so much to do in the Radio line that I quit my measly little clerical job and devoted my full time to my Radio business.

Since that time I've gone right on up, always under the watchful guidance of my friends at the National Radio Institute. They would have given me just as much help, too, if I had wanted to follow some other line of Radio besides building my own retail business, such as broadcasting, manufacturing, experimenting, sea operating, or any one of the score of lines they prepare you for. And to think that until that day I sent for their eye-opening book, I'd been wailing, "I never had a chance!"

Now I'm making real money. Louise and I have been married six months, and there wasn't any kidding about budgets by Mr. Sullivan when we stepped off, either. I'll bet that today I make more money than the old boy himself.

Here's a real tip. You may not be as bad off as I was. But, think it over—are you satisfied? Are you making enough money, at work that you like? Would you sign a contract to stay where you are now for the next ten years, making the same money? If not, you'd better be doing something about it instead of drifting.

This new Radio game is a live-wire field of golden rewards. The work, in any of the 20 different lines of Radio, is fascinating, absorbing, well paid. The National Radio Institute—oldest and largest Radio home-study school in the world—will train you inexpensively in your own home to know Radio from A to Z and to increase your earnings in the Radio field.

Take another tip—no matter what your plans are, no matter how much or how little you know about Radio—clip the coupon below and look their free book over. It is filled with interesting facts, figures, and photos, and the information it will give you is worth a few minutes of anybody's time. You will place yourself under no obligation—the book is free and is gladly sent to anyone who wants to know about Radio. Just address J. E. Smith, President, National Radio Institute. Dept. OLSS, Washington, D. C.

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

Dear Mr. Smith:

Please send me your 64-page free book, printed in two colors, giving all information about the opportunities in Radio and how I can learn quickly and easily at home to take advantage of them. I understand this request places me under no obligation, and that no salesmen will call on me.

Name .....

Address .....

Town .....State .....

JULES VERNE'S TOMBSTONE AT AMIENS PORTRAYING HIS IMMORTALITY

AMAZING STORIES

Scientific Fiction

Vol. 5 October, 1930 No. 7

In Our Next Issue

THE DRUMS OF TRAPAJOS, by Capt. S. P. Meek. (A Serial in three parts) Part I. What has happened to the lost Atlantis? Was it really lost, or have the people somehow managed to retain life and civilization in some unaccountable manner? It seems hardly possible, yet we know that "truth is stranger than fiction." Within the past ten or twelve years—we might even say, since the World War, much stress has been laid on scientific development and mechanical invention. The results are phenomenal, despite the fact that we are inclined to regard each new "miracle" with a slight rising of the eyebrows and then award it a cool acceptance. The strides a nation, unmolested, might achieve in any direction are unlimited. What if this lost tribe of Atlantis, for instance, is carrying on? Capt. Meek is at his best in this story, and even the first instalment will prove us amply justified in saying this is one of the best stories of its kind that we have published.

THE GLOBOID OF TERROR, by R. F. Starzl. The author of "Madness of the Dust" has answered the call for more stories, which reach us. Mr. Starzl is getting an increasing number of followers—deservedly, for this new story is more thrilling and more full of adventure than his others—yet he does not forget his science.

THE COSMIC EXPRESS, by Jack Williamson. If you bemoan the good old days when life was full of adventure and courage was necessary to the continuation of life, read this short story, strangely enough laid in the future. Excellently written and vivid, it furnishes much food for thought.

THE PINEAL STIMULATOR, by I. S. Stephens and Fletcher Pratt. A scientist and writer have joined to give us a short scientific fiction story of stimulating interest.

And other scientifiction stories by David H. Keller, M.D., Stanton A. Coblentz, and others.

In Our October Issue

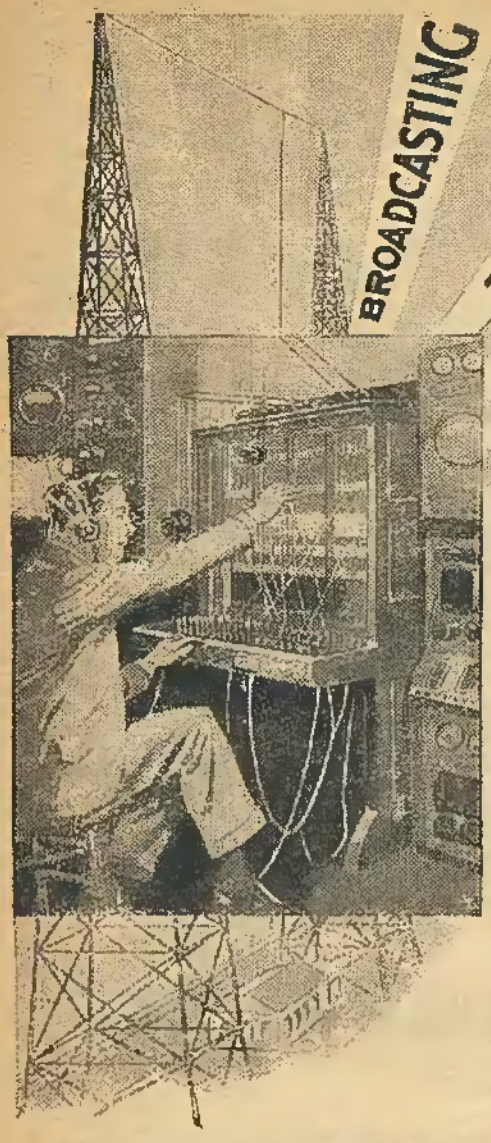
Our Cover

this month illustrates a scene from the story entitled, "The Prince of Liars," by L. Taylor Hansen, in which the rescued galley slave is introduced to the "eye" of the ship in which he is being conveyed to the Blue World, to which the strange beings with him belong.

Illustration by Morey

Published monthly by The Experimenter Publications, Inc., at 184-10 Jamaica Ave., Jamaica, N. Y.
B. A. MACKINNON, President H. K. FLY, Vice-President and Treasurer

Price 25c a copy; subscription $3.00 a year in U. S. A., $3.50 a year in Canada, $4.00 in all foreign countries.
Entered as second-class matter at Jamaica, N. Y., under act of March 3, 1879. Copyright, 1930, by the Experimenter Publications, Inc. The contents of this Magazine must not be reprinted without permission.
We cannot be responsible for lost manuscripts, although every care is taken for their safety.
Editorial and Executive Offices, 381 Fourth Avenue, New York City.



BROADCASTING TELEVISION TALKING PICTURES WIRELESS OPERATING

WIN FAME and FORTUNE in RADIO!

Don't spend your life slaving away in some dull, hopeless job! Don't be satisfied to work for a mere $20 or $30 a week. Let me show you how to make **real money in Radio—the fastest-growing, biggest money-making game on earth!**

THOUSANDS OF JOBS ARE OPEN
Paying $60, $70 and on up to $200 a Week

Jobs as Designer, Inspector and Tester, paying $3,000 to $10,000 a year—as Radio Salesman and in Service and Installation Work, at $45 to $100 a week—as Operator or Manager of a Broadcasting Station, at $1,800 to $5,000 a year—as Wireless Operator on a Ship or Airplane, as a Talking Picture or Sound Expert—THOUSANDS of JOBS Paying $60, $70 and on up to $200 a WEEK!

Learn Without Lessons *in* 60 Days

You learn ALL branches of Radio at Coyne—in 8 short, pleasant weeks—NOT BY CORRESPONDENCE, but by actual work on actual Radio, Television and Sound equipment. We don't waste time on useless theory. We give you just the practical training you will need—in 8 weeks' time.

No Books - No Lessons
All Practical Work at Coyne

Coyne is NOT a Correspondence School. We don't teach you from books or lessons. We train you on the greatest outlay of Radio, Television and Sound equipment in any school—on scores of modern Radio Receivers, huge Broadcasting equipment, the very latest JENKINS Television apparatus, Talking Picture and Sound Reproduction equipment, Code Practice equipment, etc. You don't need advanced education or previous experience. We give you—right here in the Coyne Shops—all the actual practice and experience you'll need.

TELEVISION
Is on the Way!

And now Television is on the way! Soon there'll be a demand for THOUSANDS of TELEVISION EXPERTS! The man who learns Television NOW can make a FORTUNE in this great new field. Get in on the ground-floor of this amazing new Radio development! Learn Television at COYNE on the very latest JENKINS Television equipment.

Talking Pictures
A Great Field

Talking Pictures and Public Address Systems offer thousands of golden opportunities to the Trained Radio man. Here is a great new field of Radio that has just started to grow! Prepare NOW for these marvelous opportunities! Learn Radio Sound Work at Coyne, on actual Talking Picture and Sound Reproduction equipment.

Coyne is 31 Years Old

Don't worry about a job! Coyne Training settles the job question for life. You get Free Employment Help as long as you live. And if you need part-time work while at school to help pay expenses we'll gladly help you get it. Coyne is 31 years old! Coyne Training is tested—proven beyond all doubt. You can find out everything ABSOLUTELY FREE. JUST MAIL COUPON FOR MY BIG FREE BOOK.

H. C. Lewis, Pres. *Radio Division* Founded 1899

Coyne Electrical School

500 S. Paulina Street Dept. 70-6A, Chicago, Illinois

H. C. LEWIS, President
Radio Division, Coyne Electrical School
500 S. Paulina St., Dept. 70-6A, Chicago, Ill.

Send me your Big Free Radio Book and all details of your Special Introductory Offer. This does not obligate me in any way.

Name.....

Address.....

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

SENSATIONAL!

- Scientist
- perfects
- long
- sought
- device

NEW Radio Discovery

- Hopkins'
- amazing
- new invention
- approved by experts

Now an exclusive feature of the

• 1931 HFL Mastertone

At last! Radio perfection is realized. After three years of intensive research work, assisted by a corps of laboratory experts, Mr. Charles L. Hopkins, noted radio scientist, has actually developed the first practical band rejecting amplifier. This miraculous new system, long the dream of radio designers, permits the construction of a remarkably efficient receiver which is ideally perfect in operation. Stations over the entire continent may now be received with an ease of tuning, unprecedented clarity of tone and total lack of interference that astonishes engineers and fans alike.

• Interfering Stations Rejected

Application of the Hopkins principle to the 1931 HFL Mastertone has immediately resulted in three outstanding improvements. Now, for the first time in radio history, it is possible to tune in an exact 10 kilocycle channel to the complete exclusion of everything else on the air. Not 9 or 11 or 16 kilocycles, but 10—with mathematical accuracy. Stations on each side of the selected band are sharply cut off and *actually rejected*. This heretofore unattainable action now takes place over the entire tuning range. The set does not "go broad" even on the highest wave lengths.

• Tonal Perfection Realized

The salient feature of the Hopkins band rejector system is that it handles all musical frequencies with an absolutely even intensity. No sacrifice in selectivity is made in order to obtain these marvelously realistic tonal reproductions. Although the 1931 HFL Mastertone maintains a precise 10 kilocycle signal channel at all times, every note and each delicate overtone *right up to 5000 cycles* comes through with a life-like quality that is a revelation. Far distant stations have the same superb tones due to the complete elimination of all local interference.

• 12,500 Mile Reception

Engineers the country over proclaim the 1931 HFL Mastertone to be the greatest long distance receiver ever designed. Its range is easily 12,500 miles (world-wide reception) whenever weather conditions permit such distances to be covered. Five 224 screen grid, two 227, two 245 and one 280 tubes are employed. A tremendous reserve power of *over 400 per cent* is available. The Mastertone is unconditionally guaranteed to receive any station on earth that can be heard with a radio set.

• Ultra Modern

In addition to the Hopkins RF amplifying system the 1931 HFL Mastertone incorporates every modern improvement known to science. One dial, one spot, 180 K.C. intermediate amplifier. Resistance coupled, push-pull phonograph amplifier, controlled from panel. Puncture proof, high voltage, humless Electrofarad filter condensers. Self contained, all steel heavily cadmium plated chassis. Doubly shielded radio frequency circuits and dozens of other entirely new features. Our FREE literature gives complete information and prices. *Send for it today!*

DEALERS: The New Mastertone is the sensation of the century. Get in on the biggest radio boom ever known. Rush this coupon attached to your business letterhead for special proposition. *ACT QUICKLY!*

HIGH FREQUENCY LABORATORIES

Dept. D, 28 North Sheldon St., Chicago, U. S. A.

HIGH FREQUENCY LABORATORIES, Dept. D
28 North Sheldon Street, Chicago, U.S.A.

Gentlemen: Please send me your FREE literature and photos of the 1931 HFL Mastertone.

☐ Check here if your name is *not* on our mailing list now.
☐ Check here if you have been receiving mail from us.

*Name*_____

*Address*_____

*City*_____ *State*_____

(PLEASE PRINT PLAINLY)

Send This Now!

This coupon is not an order . . . you incur no obligation

HFL

VOLUME 5

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

OCTOBER, 1930 No. 7

T. O'CONOR SLOANE, Ph.D., *Editor*
MIRIAM BOURNE, *Managing Editor*
WILBUR C. WHITEHEAD, *Literary Editor*
C. A. BRANDT, *Literary Editor*
Editorial and General Offices: 381 Fourth Avenue, New York, N. Y.

Extravagant Fiction Today - - - - - - - - - - Cold Fact Tomorrow

The Million

By T. O'Conor Sloane, Ph. D.

THE writer was told by a young man, lately out of school, that he and some friends had once undertaken to count a million. This was done as a matter of curiosity or interest, and it took them several weeks to complete the count. This shows what a large sum a million is. The calculation is often made of how many hours it would require to count this sum, allowing so many counts to a minute. This we leave to our readers to do for themselves and if they never looked into it, they will be surprised at the length of time it would take to finish the counting.

In the conception of distance Edgar A. Poe says in one of his stories that he doubts if anybody can contain within his mind the conception of the distance from a milestone to its neighbor, and this is only 5,280 feet, about one two-hundredth part of a million feet. The circumference of the earth at the equator is about one fortieth of a million of miles. It appears for us on this earth that a million is a pretty good sized number to work upon or use as a unit.

The moon, our faithful satellite, is less than one quarter of a million miles from us. If she was the full million she would be about one fourth of her present diameter in appearance. That is to say she would subtend an angle of about one eighth of a degree, and her apparent area would be about one-sixteenth of what it is now. So we see that a million is a pretty respectable unit or quantity when we go out into the solar system and not beyond it.

In time a million of minutes, hours, days or years are very long periods. The historical period of the earth may be put at about six thousand years, a quite small fraction of our million quantity.

Having once formed a conception of what a gigantic thing a million is, we may go out into space beyond the planets and the sun and still further out among the stars and we will see what an insignificant unit a million is when we deal with stellar distances. The sun is about 93 millions of miles from our earth, so if our readers have calculated how long it would take to count a million, let them see how long it would take them to cover the distance from here to the Sun by the fastest automobile. This will give some idea of what a hundred million would be. In this curious solar system of ours, where at least nine planets revolve around the sun, practically all in one plane, the earth must rank as rather near to the sun. The frigid Neptune is nearly thirty times as far from the sun as is our earth, and way outside of it is the new planet, definitely named Pluto, but for which the name Minerva has been suggested, so as to have one more member of the fair sex among the planets. Without going away from our solar system, we see that the million becomes in itself a convenient unit. If we take the size of the sun, we will find that its diameter approaches a million miles, so that its volume is so inconceivably great that the number of cubic miles in it is beyond human conception. Three suns would be as large as a million earths and it is fair to say that in the case of the sun, we are brought face to face with the enormous quantity units of the astronomer. The sun is constantly changing, parting with its matter, and sending out into space every second enormous quantities of radiations, and yet it is so gigantic that the loss amounts to nothing as far as we are concerned. But all this is nothing when we come to the stellar world.

Light travels at the rate of between one sixth and one fifth of a million miles in a second. Now, multiply this number of miles, about 186,000, by the seconds in the year (we will let you do this for yourself) and you will get the length of what is known as the light-year, over 63,000 times the distance from the earth to the sun. It is the great unit for stellar or star distances. If we take the star, Sirius, one of our nearest neighbors, we will find that its distance from the earth has been determined by astronomers as 8.6 light years. So we find that our unitary distance of a million of miles is negligible or extremely small in the stellar world. The sun is over 800,000 miles in diameter. Some of the stars are supposed to be equal to the diameter of Neptune's orbit in their linear dimensions. We have given our readers a chance to do some figuring, so taking this distance, between five or six thousand millions of miles, as a diameter of a sphere, let them calculate the volume of a sphere of that size and see how big a respectable star can be when it tries to see what it can do.

The geologists talking of the ages of the earth, speak of millions and billions of years without hesitation, but their quantities are small compared to astronomical distances and volumes. Time is sometimes referred to by generations; the generation is taken as a sort of unit. If we come back to our million we will find an enormous number of generations in it, unless our references to stellar distances have made the million fade away into insignificance.

Now let us go back to what may be called a modified epicurian chaos. Imagine matter in atomic or molecular state, mixed up in endless confusion. Let it now be imagined to start a process of combining into different substances and imagine that process becoming more and more complicated and leading to the production of substances more or less as we know them now. Then, coming down through the ages, let us imagine a constant system of change and production of rocks and vegetation, and animal life as we see it today, or as it might have been seen in early geologic eras and as a culmination on this sphere, we have man with his amazing intellect. It is no wonder that the strict evolutionists need millions and billions of years to carry out their building up of the world. So if we accept the epicurian philosophy, we will have to take the world's million years as a comfortable working unit. The more we look at it and study it, the smaller this million appears when applied by man to cosmic relations.

The Prince of Liars

By L. Taylor Hansen

Author of "The Man from Space," "The Undersea Tube," etc.

MINKOWSKI, a distinguished relativist, puts it beautifully, when he says of Einstein's conception of relativity and the fourth dimension: "We are familiar with the "Wanderer Fantasie" of Schubert, its tonal disposition is realistic, conforming to nature, yet its general expression is transcendental—so is a ramble with Einstein. . . ." But he, of course, is supposed to be one of the dozen men who understand Einstein. But whether you have been able as yet to master any of this master's conceptions or not, there is a world of fascination in this story, which penetrates, in easily followed paths, the mysteries propounded by this foremost scientist. We recommend the careful study of this tale.

Foreword

Have You Read Einstein?

PERHAPS it was this embarrassing question which is thrust upon one from every angle in scientific circles; or perhaps it was the suspicion that for a theory which is supposed to be so incomprehensible that only twelve men in the world can really grasp it, and of these twelve not one knows who the eleven are, it is humorously said. Relativity has certainly stirred up an astounding number of arguments among the ranks of the physicists, or perhaps it was the reflection that since it would be remarkable to find minds as different, and backgrounds, trainings, temperaments and nationalities as divergent as those of Cunningham, Lorentz, Borel, Birkhoff, Eddington, Weyl, Hevesy, Lodge and Slosson, for instance, agreeing about the most obvious of questions, it would be nothing short of a miracle to discover that they agree as well as they do on the fundamental precepts of Relativity, if we must believe that they do not really understand the points under discussion in the first place: or perhaps it was a combination of these facts which made me suspect that Einstein is somewhat better understood by the scientists than we have been led to believe. However, I do not mean to insinuate that, because of this suspicion, I decided to write a treatise upon Relativity in the form of a scientific fiction story, or that I am setting myself down as another interpreter of his genius. Indeed, no. On the contrary, I urge every man who can beg, borrow or steal the time, to go to the public library and become acquainted with this riot of debate that is sweeping the ranks of our scientists. Einstein's own book, or rather abstract, is almost unreadable, being a sort of shorthand of higher mathematics, but there are plenty of others, one of the most delightful of which, perhaps, is "Einstein and the Universe," by Nordmann.

At first your mind will be, no doubt, a battleground of ideas. Some pet theories are dragged out and shot during the conflict, and their ghosts are hard to bury. And yet, Einstein gives us so much more in their place that we are well compensated for their loss. He puts the word "impossible" with definite directness into the language of science, and yet his possibilities are so much more interesting — as for instance, when he is reported to have said that it is quite impossible for a moving body ever to attain a velocity greater than that of light, because it is scientifically inconceivable, but, on the other hand, it is conceivable, and therefore within the range of possibility, that man may yet fly to the most distant constellations.

Then as the great structure of this new physics begins to take shape, you may experience some of that feeling of awe which came to me and gave the inspiration for this story. And if this little tale, treating, as it must, only one phase of that mighty structure, has any charm, it is because Einstein's conception is so magnificent that, though one is grounded to reality, yet one seems to be listening to the harmony of the stars.

Indeed, as his friend and admirer, Minkowski, so well describes that impression:

"We are familiar with the Wanderer Fantasie of Schubert, its tonal disposition is realistic, conforming to nature, yet its general expression is transcendental—so is a ramble with Einstein. . . ."

The Prince of Liars

I MIGHT just as easily have called this tale "Speaking of Einstein," though I do not mean to suggest by this that Einstein is a liar. However, my transformation from a skeptical Newtonian to a radical Relativist was accomplished by a man who, though he cheerfully admitted he had sometimes been called "The Prince of Liars," yet gained his point not by arguing relativity in the ordinary fashion, but by telling me a wild yarn which, even in my sanest moments, I am more than half inclined to believe. But I am anticipating. . . .

Illustrated by
PAUL

Suddenly a portion of the heavy glass opened inward, and the ship nosed her way down. . . .

I do not know that I would have ever met Dr. Smead if it had not been for his watch-charm, which was shaped like a miniature sun and glowed in the dark. It was night when I first saw him. I was feeling my way through the damp blindness of a London fog, guiding myself partly by instinct and partly by the diffused shimmer of the street lamps, when I saw his watch-charm approaching me like the glowing eye of a wounded tiger. After having lived a year in tropical jungles, it gives one a start to see a small light coming noiselessly out of the dark. Perhaps that is why I unhesitantly bumped into him and profusely begged his pardon, in order to get a closer examination of the uncanny little light. And yet when I looked up into his seared face with its livid scar that slanted crosswise over the forehead, twisted the corner of one eye and divided the right cheek into pieces, my confident voice petered out lamely, and with a confused murmur I hurried on.

I do not know why, but that face haunted me. I had seen faces before that were terribly scarred, but this one was different. Sorrow and suffering were mingled in those eyes—they were eyes of a man who has gone through more and has seen more than one mortal should have experienced and seen.

Therefore I do not believe that I would have quickly forgotten the incident, even if two evenings later, at the reception of the Peruvian Ambassador, I had not seen him again. But coming as it did, so soon after our first meeting, the sight of that face was like the realization of a nightmare. Hurriedly I sought a South American diplomat with whom I was slightly acquainted, and pointed him out.

"That man is an interesting mystery to us all," he murmured with a smile, "perhaps because he seems to have no country and is rather amusingly inflicted with hallucinations."

"Hallucinations?"

"Yes. Among other things, I understand that he claims to have lived through past centuries and upon other planets. Sometimes I think he is crazy and then, again, I think he is an expert liar."

"You know, I could almost say that he looks the part."

"The psychopathic experts say he is harmless."

"Have you ever noticed his watch-charm?"

"No, I can't say that I have."

"Being a geologist, it interests me. You haven't heard any stories about it, I presume?"

"No—I believe not. He has had a good deal of fun poked at him, but if you ask him seriously straight out, I do not doubt that you will get some wild explanation concerning it. Would you like to meet him?"

"Very much, indeed."

And so it was arranged. I found him a most fascinating companion, well educated and well traveled, though no mention was made of other countries or strange planets. In fact, knowing that one must always pilot the insane away from the subjects which are their weaknesses, I avoided both of these, finding plenty of material for mutual interest among the adventures in out-of-the-way places, in which he could not only match my own varied and hazardous life, but even best it. I reflected, it is true, upon his reputation for the unusual, but dismissed my reflections with the thought that if he was a liar, he was indeed the most ingenious and entertaining liar I had ever encountered. And that was a compliment, whether he would have considered it such or not.

Perhaps he thought the same thing about me. I do not know. But at any rate, he was kind enough to invite me to his apartment the following evening, and I was not at all slow in accepting the invitation.

It occurred to me as I was seated on the trolley car the following night, that like my South American friend, I had not placed the man's features nor his slight accent, though I could have sworn he was neither an Englishman nor an American. But I dismissed the thought with a shrug a moment later, as I alighted and turned down the street toward the address he had given me.

The smell of an exotic incense hung like an aura over his mellowly lighted bachelor quarters as I followed a bowing Hindu through a maze of silky Oriental rugs and strange drapes to a cozy library where a log fire was crackling on the hearth. It was obviously the apartment of a rover, being filled with the oddities which one picks up in various corners of the earth. A stone god from Yucatan frowned at a coolie hat on the opposite wall, while a fat green Buddha of unfathomable age sat smilingly upon an equally curious Navajo rug, carrying the symbol of the double cross with a fringe of the Greek motif. I carried the memory of that rug for several moments, intending to mention the strange resemblance of ancient symbols, whether found in the Old World or the New.

"Master will be ready in a moment," the Hindu murmured as he motioned me to a divan of odd design and slipped away silently.

I sank back in the cushions and looked around at his library, at the fireplace, and the table which, strewn carelessly with a few volumes of various sizes, was emphasized mainly because the light from the floor-lamp streamed over it. From where I sat I could read some of the titles of these chosen works — Newton's Principia, Einstein's Special and General Theories, Pliny's Lives, Aristotle, Poincaré, Kant and Virgil were heaped there in confusion. Turned the other way, a large volume of interesting age lay open, its yellow leaves reflecting the lamplight.

ALL around the room were book shelves, except one large open space where a huge life-sized painting covered the wall. It was to my back and in the shadow, but I saw immediately that it was the most arresting object in the room. Not only was it masterfully executed with a richness of tone that was reminiscent of Rembrandt, but the subject nearly pulled my breath from my throat, for though I looked upon what appeared to be a Roman galley slave, chained to his bench, drooping with toil and marked with the stripes of the driver's whip, yet the face was strangely familiar. As if drawn by an invisible force, I got up and turned all the way around while I stared at those tired, anguished eyes from which hope seemed to have died. Then suddenly, as if with a wave of cold horror, I recognized him. It was the same face I had stared into that night of the London fog, the same except for one thing—this man in the picture bore no terrible scar upon his face.

"You are startled at the likeness?"

I whirled back to face the doorway, where he stood with a faint smile of amusement upon his lips, the upper part of his cloven cheek shining slightly.

"Not startled," I corrected him, "just positively shocked. You make a most excellent model."

"Yes, even better than you imagine."

There was a trace of bitterness in the words which I could not account for at the moment.

"Who painted it?" I asked, taking my seat again.

"It is my own work. I do not claim to be an artist, however. Painting is simply a minor avocation of mine."

I stared in puzzled unbelief as he crossed the room and sank into the cushions beside me. I was being uncomfortably reminded by my reason that such a masterpiece means a background of intense study and hard work. The painting was too good for the brush of an amateur. Again I looked at his face, thought of all the adventure tales he had told me and their suggested years of travel—and remembered the hallucinations. His face was not that of an old man. With the uncertain light of the fire playing over it, I judged it was within ten years of fifty, the age when, according to their works, men usually reach their intellectual prime. Of course he might have painted it. But when had he found time to travel and to study science, as I found he seemed to know it in almost all of its branches? Yes, frankly, when had he found time for it all in the short span of fifty years?

My face must have reflected some of these thoughts, for he leaned back in the cushions and laughed.

"You think I'm a great liar, don't you?"

"Excellent," I admitted.

"Why? Because of the painting?"

"Certainly. I do not say that you are a genius, or that you are not. For convenience we will say that you are, but you are also a student and a rover, and even genius must learn to handle its tools."

"True. Very true. And I have studied many years under masters of whose existence you have but little conception. The chemistry of my paints also . . . they will not fade with the years."

"I know a little of the principal great living teachers."

"Of this earth, yes. But we live upon such a tiny atom of space. The artistic instinct is not confined to mankind."

"Surely," I nodded, wondering if I had not better change the subject.

A faint smile flitted for a moment over his lips as he glanced from my eyes back to the fire. But somehow, I could not look away from him. No wonder my friend had called him an interesting mystery! Almost without realizing it, I stared at him thoughtfully, while he leaned back in the cushions and twirled that little watch-charm on the tips of his fingers. I remembered my interest in the glowing stone and decided to ask him about it.

"You know the psychologists say that curiosity is the driving power of the scientific mind," I began somewhat lamely, and then taking courage as he glanced back into my eyes with a friendly smile, "it is fairly lashing mine. I mean the watch-charm. Where in the world did you get it?"

"I remember, you did tell me that you were a geologist. Would you be startled if I were to tell you that it is a substance originally extra-terrestrial?"

"You mean a meteorite?"

"No. Unlike a meteorite, it was not brought from elsewhere and into the attraction of this planet by chance."

"I do not understand." I smiled as evenly as possible.

"It came into my possession long ago—very long ago as you reckon time. By the way, are you a relativist?"

"No, a Newtonian. I believe in the absolute values of time and space." I smiled, glacing at his volumes of Einstein.

"Do you mean to say that you think time has the same value here on our little planet as it has, say, on Sirius, where the density is greater?"

"Certainly I do."

"Well, then, as a scientist, let me remind you that though the driving power of the scientific mind may be curiosity, its greatest asset is suspended judgment."

"We are all subject to prejudices of one type or another."

"I admit that. And yet, as we grow up intellectually, they tend to dwindle. For instance, we have gone beyond the dog, who having learned that there is such a thing as property, suspects everyone of being a thief. But, on the other hand, having learned to measure time with clocks, mankind is still suspicious of anyone who could suggest such a thing as the elasticity of time. It was not long ago that they felt the same way about mass . . . ."

"BUT what has Einstein and his theories to do with the watch-charm?"

"I am coming to that. In the first place, let us thrash out between us this matter of time, or we simply cannot understand each other at all."

"All right, go ahead," I grinned, settling down for a good argument.

"Do you admit that in this space-time continuum, in which we find ourselves at present, we make use of time to measure every event and experiment?"

"Yes, that is true."

"Now we measure events in three dimensions of space also, do we not?"

"Yes."

"And since we measure events in the three dimensions of space and the one dimension of time, time must of necessity become our fourth measure or our fourth dimension. Put out of your mind all thoughts to the effect that we can therefore travel through it, or other nonsense. I am simply naming it as the fourth measure which we use daily in all of our conversation."

"Certainly we make use of it, but that does not make it a dimension," I countered. "Time might just as easily be thought of as an illusion. For instance, if we want to name the place where the coronation of George III. of England took place, we must, you say, not only find the spot through the three dimensions of space on our globe, but we must also go back through the dimension of time in order to point out the exact spot in space, since the earth as well as the entire solar system has moved a great distance in the meantime?"

"Yes, of course."

"But I say, not at all."

"And why not?"

"Because, if from the Newtonian point of view, seated somewhere in the heavens a privileged observer in space could know to a needle-point just how far the earth has moved around the sun, and the sun has moved in the, or rather with reference to, the Milky Way, and how far that has moved in respect to other island universes, etc. . . . etc. . . . he would find that spot, would he not, without bothering about time?"

"An interesting conception," he smiled. "But since we are not off in space and do not have all that interesting information, we must measure time, and continue to make use of it as a dimension."

"However, my point is that this is only because we have limitations."

"Certainly. Every observer has his own limitations, and therefore his own point of view. An observer on Mars would have his limitations and an observer on Arcturus would have still others. And I might say that the Newtonian point of view has its limitations."

"For instance?"

"Physicists have lived on earth for so long that they cannot get off of it, even in thought, long enough to see that there is no set standard of measurement. Earth-time and earth-space need not be the same as the time and space on Vega, Saturn or even Venus. Suppose, for example, that some mischievous wizard decided to fool mankind by lengthening out one ordinary day, so that it would last a thousand years. If all clocks, all motions and all physical processes were also lengthened in proportion, would we know the difference?"

"No, we probably wouldn't."

"Why not?"

"Because there would be no means of comparison."

"Then it is possible for time to be thought of as elastic?"

"But since we have no such ingenious wizard playing these pranks, we must continue to think of time as absolute."

"Are you sure?"

"I think so."

"And yet it was not so very long ago that mass was also considered a most dependable and unvarying measure, was it not? Physicists built theories and made experiments upon the stability of mass, didn't they?"

"Yes," I admitted with a smile.

"Einstein was considered a little mad because he thought mass would be found to vary with velocity. And what has happened? Men soon found that they had been mistaken about mass, because heretofore they had dealt only with very low velocities. But the beta particles of X-Rays having a very high velocity changed things, for their mass was found to increase in the measure predicted by the new physics.* Mass is not a constant."

"Even though I should grant this, yet we were talking about time," I reminded him. "And I still believe that time is a constant, as I believe in the absolute value of space."

"You are wrong. Time and space might both be warped by the presence of matter. In other words, taking one of these beach-resort mirrors which make us absurdly short, would you say that the measurement in that mirror was correct for the mirror?"

"Well, in the Land of the Looking Glass, measurements do seem to vary, according to the particular mirror under observation."

"And why? Because our measuring rods also vary according to the mirror."

"But of course we have the proper one beside us in the Land of Reality with which we can always correct the error in the Land of the Looking Glass."

"Ah, but that is just the point. We are using measurements that seem absolute, in our Land of Reality, but is it not possible that they are simply correct for us living here in a globe of a certain size and composition in the continuum of earth-time and earth-space? Euclidean geometry, in which only one line may be passed through a given point parallel to a given line, would not work on a curved surface. It is very possible to conceive of a type of space in which one would use, not the geometry of Euclid, but rather that of Riemann."

"I do not follow you. Do you mean to say that there are worlds where we would be much shorter than we are here?"

"And furthermore we would not know it because our measuring stick would also be shorter."

"But as for time. . . ."

"I believe that I can illustrate my point better with a story."

"Great! I enjoy your stories—fantastic or not."

"This will be fantastic, all right. And yet, it is one that a relativist would say could be true."

"I have noticed, haven't you, that it is the tales which could be true, but probably are not, that make the best entertainment?"

"And the best liar of the narrator?"

"Absolutely! To tell the truth, I enjoy listening to a first-rate liar—the kind, I mean, that makes you believe him—for the moment."

"Am I to suspect that some of the yarns you have been telling me about the Amazon are. . . ."

I shrugged my shoulders indifferently.

"Why bother over minor details? Truth usually needs coloring, you know. But I must warn you that even credulity such as mine has a vanishing point."

He laughed.

"All right, I will try to keep away from that point, though I may as well admit, before beginning, that I have sometimes been called the Prince of Liars. However, I would rather have a frank doubter for a listener than an apparently agreeing hypocrite. You always know just where you stand with the doubter."

Then walking over to the buffet, he poured out two glasses of ale, remarking as he handed me one:

"To the man who admires a good liar! May he some day realize how fantastic the truth can be."

AS I swallowed the last gulp and pushed the empty glass toward Einstein's latest pamphlet, my host sank back in the cushions and spread out his hands to the fire.

"I will have to take you back a good many years."

"Two or three hundred?"

He gave me a quick, sharp glance.

"No—even farther back. We will picture a warm, star-strewn night in ancient Greece on the shore of the Mediterranean in the year 522 B. C. Pythagoras, the unequalled, had just completed his most illuminating lecture on the solar system, and one of his younger students wandered in absorbed revery with his eyes on the stars.

"Pythagoras was, as you know, the first man to discard the title 'Sophos,' meaning 'Wise man,' for the word 'Philosopher' or 'Lover of Wisdom.' Scientist—astronomer and mathematical genius—to mention only two of his fields; what a shame that the brilliance of his name has become clouded with superstition! But I forget that in the eternal struggle between knowledge and creed, the science of one millennium becomes black magic in the next, and is so disguised that when knowledge again gains the upper hand, it fails to recognize its own."

He filled his pipe thoughtfully and struck a match. The repeated flares, as the tobacco ignited, lit a face that for the moment seemed as old as that far off age—bitter with the futility of history's repeated failures and the blind stupidity of mankind.

"As I say, it was a warm night," he continued at last. "The sea washed in quietly, and Gnostes, as we will call him, was too much absorbed with the thoughts which the master had just given him to notice that a boat had been beached noiselessly behind him. A moment later there was a fierce, wild struggle with bearded ruffians, who finally knocked their victim unconscious and rowed quickly out into the silent sea with him stretched on the bottom boards of the boat."

He blew a smoke ring thoughtfully toward the fire.

"It was not unusual in those days for rich young men to be kidnaped and held for ransom. We will suppose that the disappearance of this one became the sensation of the year, but that gossip at last burned itself out, and the society of the day finally began to look elsewhere for its sensations. And so the civilized world of Greece forgot the young scholar whose family, position and wealth have now been lost so long in the annals of time.

"And yet, though cut off forever from his world, the boy had not died. Shipwrecked again before the pirates could communicate about the ransom, and rescued by a trireme ship, whose brutal master, being short

*Hevesy—Manual of Radio-Activity.

of slaves because of recent cruelties, chose to laugh at his story and chained him to the oar, the boy toughened into a steel-muscled youth—but his soul became—like that."

I shuddered almost involuntarily as I saw him nod toward the painting, which gleamed so lividly among the shadows.

"But hope dies hard. In spite of the cruelties of the slave-driver, the life was an out-of-door life. Also the work was hard and the food contained no softening elements. And so with renewed vigor in the body came a renewed desire for life—and revenge. During the nights when the guards slept or made merry with wine, he began to rub the links of his chain until at last two of them became dangerously thin. Then he could laugh, for he was strong now. Finally his break came. The ship was sailing majestically into a new harbor, on whose shores gleamed a marble city, rose-lit in the sinking sun.

"Gnostes knew that this was one of the lands whose very existence had been held a trade secret by the men who held him in bondage, and he knew that this secret was more precious than the life of any slave. But this knowledge only made him the more determined to get away or die in the attempt—for he swore that they should never take him alive. Therefore he waited with increasing impatience, while he helped to pull the ship into the colorful harbor, passing dirty fishing boats and pleasure craft with silken sails, while his eyes roved furtively toward the banks where marble palaces caught the last rays of the reddened sun. The first night in a port was always a night of carousal, he remembered, as he clutched his portion of broth and watched the distorted sun drop into the jungle that yawned behind the Acropolis of the city. For the purpose of the story we shall call it the Port of De. Its real name, like that of Gnostes, is meaningless today."

The sea-gray eyes of Dr. Smead held a far-away look as he stared at the coals of the fire. I could almost imagine that he was the slave holding that bowl of broth and glancing furtively toward the gleaming palaces that lined the waterfront.

"But fate had not arranged things quite as well as she might have done. Perhaps the youth was too impatient and could not wait until the liquor had entirely drugged away the watchful senses of the guards. Be that as it may, the splash of his body as he dropped over the side of the ship, was heard by someone who managed to gather together a few of the more sober revellers and start after him in pursuit.

"But they only pursued a slave while Gnostes swam for his life. Diving under water and coming up beside the slippery hull of one craft after another, he could always see the boat somewhere behind him—the occupants now dragging the water with nets as their bending shapes were silhouetted in the glow of the full moon, and again leaning far out to cut the water with their lances. Bits of wood tossed against his skin now and then and once a dead fish struck coldly against his face, but he swam on dodging and diving—always making for shore.

"FINALLY he pulled himself up on the beach. No marble palaces were here. This was a poorer stretch; from the stench of salted fish he judged that it was used by the fishermen to dry their nets. One glance confirmed his guess, and he threw himself prone in the shadow of a boat, scarcely daring to breathe as he heard the scrape of the pursuing boat on the sands. For what seemed like hours, he crouched there listening. Someone had evidently seen him creep up on the shore for they were spread in a circle—a circle that kept closing in. At last he knew it was only a matter of time until he would be discovered, and so he determined to make a dash for safety. He had gotten his wind back, and even though his pursuers were not weary from their dash for shore, yet they were still probably a little dizzy from their celebration which he had interrupted, and he had at least an even chance of beating them for a short way. But where would he go? Then suddenly he remembered the red light of the sun as it touched the Acropolis. These people must have a temple of some kind. And if they had, he would be safe in the temple, for no matter what gods might be worshipped there, one of mankind's sensitive points was that he did not like to have his gods insulted by a murder committed under their eyes. What happened outside, of course, did not matter.

"So suddenly he darted through the surprised searchers and dashed toward the city with the pack at his heels, following now in full cry. Jostling conversational groups and little cliques of bargaining merchants, he tore through the darkened streets of the city toward the Acropolis.

"He had succeeded at last in out-distancing his pursuers by a few hundred feet as he dragged himself, sobbing for breath, up the marble steps and across the mosaic floor of the temple. Lighted fitfully by the gleam of two torches on each side, sat the Goddess—a huge wooden image, which stared thoughtfully into space as she crouched there upon the outspread paws of a tiger. The strangest thing about her, perhaps was her eyes—for they seemed to be formed of miniature suns which glowed faintly in the semi-darkness.

"Gnostes had already staggered half-way across the floor, dragging one dripping leg after the other as if they were half-paralyzed, when he caught sight of a young woman in the shadow between the paws of the Goddess. In a dull sort of way, he realized that she was perhaps the most beautiful woman he had ever seen. Her long hair which rippled about her was of deepest auburn, but in the turn of each curling ripple, it gleamed with dashes of golden flame. She turned and looked at him with eyes of pity. Gnostes knew then that if she was once won she would protect him, for she was surely not a coward. Her very grace of movement was that of a thoroughbred.

"Quickly he threw himself upon his knees—imploring her help with his eyes and his outstretched arms, as he heard the first triumphant shouts of his pursuers. They would reach the temple any moment. Desperately, he looked at her. For the fraction of a second her eyes measured him and then hearing the cry of the oncoming pack, she touched a hidden spring with her sandal and indicated a door that yawned suddenly between the paws of the Goddess. He stumbled forward into the opening—the door snapped shut behind him—leaving him in darkness. Then, after a moment of adjustment, he realized that the darkness was not utterly black. The light was still flickering in through a tiny peep-hole, and he turned stealthily around so that he might look out. She was kneeling before him, so close that he could almost touch her hair—that glorious sheen with its red-gold glints.

"Then like a flood they burst in and filled the temple—shouting, jabbering, quarreling and cursing. She turned around and drew herself up imperiously. But apparently they had not even seen her, for they set about searching—peering into corners and running around the fluted columns. She held up a protecting arm, but they paid no attention. And then one of them, a short man with bristly red hair that covered him like a sparse fur, pointed to a wet spot upon the beautiful mosaic of the floor. It was the spot where but a moment before, Gnostes had kneeled before the auburn-haired priestess and held out his arms in his plea for protection. Now that very act, instead of saving him, had given him away. He looked at the little pool of muddy water as it gleamed in the torchlight, tracing each step toward his hiding place in those muddy footprints which had followed him like the merciless mark of fate. He groaned. Then a strange thing happened. The groan echoed and re-echoed throughout the temple in tremulous waves that sent the blood curdling up his spine. The girl with the auburn hair had hidden him in the talking-chamber of the Goddess!

"But if the groan had made his blood curdle, it froze that of the men. Everyone had suddenly stiffened, with eyes almost popping from his head and hair standing out like that of a Bushman. The little furry man stood there with loosened jaw, his knees fairly clattering together. The effect was so absurd that he had the mad desire to laugh, which he only succeeded in preventing after a few whispered snickers had burst through his fingers. Then once again came a demonstration of those echoes—only now they were magnified into sardonical laughter that whispered from wall to wall as if all the unseen spirits of the dark regions had gathered in the shadows to mock these human fools who had dared to defile the temple. This was too much for the superstitious traders. They fled in confused terror. Pushing, shoving and scratching, in their madness to get away from the haunted horror of that shadowy roof, they scattered into the night like frightened rabbits and Gnostes never saw one of them again. Thus the slave met the priestess Thora."

Smead had stopped smoking long ago, and now he was unaware that his pipe had gone out. With his strange sea-grey eyes upon the coals of the fire, he seemed to be staring at it as if he could conjure from those glowing galleries the features of that young woman of another age.

"Well?" I asked at last.

He started, as if from a dream.

"OH, yes. I was telling you of Thora, wasn't I? It is hard to describe her mind and its tremendous storehouse of knowledge. She was unusually well educated, even for a priestess, this daughter of one of Egypt's high officials and a Celtic slave. Her understanding of the lore of Egypt was immense—lore that the world has long since lost. To Gnostes, in the weeks which followed, she taught not only her language but she also explained many of the things which to archaeologists of today are inexplainable—namely, the discoveries of shockingly accurate scientific knowledge among the ancients, side by side with childishly naïve superstitions. She revealed to him the closeness of that world which we of today think of as prehistoric. She disclosed the vast extent of ancient travel and the accurate knowledge of the earth's topography, which degenerated in the wars and disasters that followed, into trade secrets to be guarded with one's life. With a perspective that viewed the past by thousands of years, she pointed out the eternal struggle between the drive for knowledge, which is science, and the clinging to old beliefs and out-worn superstitions, which is creed. During one millennium science had forged ahead until the ignorant masses, which it had ignored, became carried away by some new religion and made the world unsafe for knowledge unless employed in the service of the reigning creed. So the following millennium became again the dark ages of ignorance. Men no longer freely sailed the seas, fearing unknown terrors, while a few cities waxed rich in the light of certain "trade secrets." Learned masters, on the other hand, taught in secret and hid their discoveries. Religion again reigned supreme—whether the powerful Amen of Egypt or the Feathered Serpent of America. Yes, Thora knew about the golden cities of Peru. . . .

"So it was that choosing to serve science, she had been forced to serve creed. No one else but the priestly cast had any business searching for knowledge, you see. And Thora was tirelessly searching.

"One night as they were sitting in the upper chamber of the Goddess-image—a hidden chamber behind those strange glowing eyes where Thora had concealed Gnostes for weeks, she leaned over and touched his hand, whispering with a queer tenseness:

"'There is something I must tell you. Prah, the head-priest of the Mahyak shrine, suspects your presence. If he finds you, it will be death for us both. They will bury me alive, and you they will boil in oil.'

"Gnostes tried to control his recoiling muscles.

"'Do not fear. He will not find you. I have sent for the men of Allos. They arrive tonight.'

"'The men of Allos?'

"'Yes. I was going to tell you of Allos in a less abrupt manner, but there is no time now. The fewer the words, the less we are apt to be discovered. Yet there are some things which you should know. I had hoped to lead you up to this knowledge gradually, but I must make every word count tonight.' Gnostes nodded silently.

"'I was captured long ago—it matters not how long ago, because you will learn the details later, and carried off to a distant planet. Our people had called it "The Blue World," though it had only come down to us in the most vague of legends. Once, it seems, the earthmen had communicated regularly with Allos, but something happened which destroyed the civilization on the earth. Perhaps it was a series of disasters, but I prefer to think it was a terrific raid of death from unknown beings. I mean from creatures that came to earth from somewhere out in space. The men of Allos found only smoking ruins on their next trip and so for a thousand years they did not return. When they did come back, it was to find that earth-men had again reverted to the condition of savages living in jungles and so they were fated to call the disaster a mystery and would have, except for one thing. . . .'

"Gnostes was beginning to wonder if Thora had suddenly gone mad, though perhaps his training under the great Pythagoras had prepared his mind for the reception of strange ideas to a far greater degree than was the case with the minds of countless thousands of his fellows. Therefore instead of ridiculing the turn of her mind, he asked quietly:

"'And what was it that gave them a clue to the solution of the mystery?'

"She smiled slowly—a strange, enigmatic smile.

"'It was these stones,' she said in a soft voice, touching the back of the image's eyes. 'It was these rocks—these rocks that do not come from our earth—these rocks that are shaped like miniature suns and which glow in the dark.'"

SMEAD was fingering his watch-charm as he said this, and again my eyes were drawn, as if by a magnet, to that curious bit of stone.

"'These rocks were thought to be weapons perhaps, but that has never been proved definitely. . . .' She lingered a moment, with her fingers still on the stone, as if she were just on the point of disclosing a secret. But the secret was locked up again behind her laughing, fearless eyes and she seated herself on the floor beside Gnostes, with a shrug of the shoulders.

"'As I said, I was carried off to Allos long ago. It is in fact, my home. I was educated there. On earth I am but an agent for the men of Allos, gathering all the knowledge I can, while I am here, and returning again. Now my time here is about up. Tonight I am going back to "The Blue World" with my report, and you are going back with me.'

"But to Gnostes this was wild and foolish talk. The important thing was that the head-priest had suspected his presence.

"'You know, Thora, I believe that the head-priest is in love with you,' Gnostes said.

"She threw back her head and laughed merrily.

"'Nonsense. He is simply jealous of my influence here. Until I came, he was all-powerful.'

"'And how did you come?'

"An impish smile played mischievously over her lips for a moment.

"'It was all very mysterious. The people here will tell you that one night strange rays of colored light shone down like many suns over the city, and the next morning I was found on this hill, holding the stones which were to become the eyes of the Tiger-Goddess.'

"'Of course some fools may tell such lies, for there are many fools in a city of this size, but you do not expect me to believe them, do you?'

"She shrugged her shoulders with a teasing smile.

"'Would you believe me if I were to tell you that on the Blue World, men have learned to talk by means of a thin copper string laid under the ground, and that because of this instrument, the voice of a child can be carried even as far as your own land?'

"'Absurd.'

"'Or that they have learned to record the voice of a singer so that after the performer has died, they can by means of another instrument, still hear his song if they so desire?'

"'Don't you think I have some adult intelligence, Thora? I am aware that such nonsense is utterly impossible.'

"'Or even more strange perhaps,' she continued with tantalizing indifference, 'is the instrument by which they can send the human voice around the entire globe . . . or the instrument with which they can produce the human features on a blank wall. . . .'

"'Thora, I am no child that I need to be entertained with fairy tales. I never in all my life heard such monstrous stories from the most fantastic of liars. I thought you had a higher opinion of my intelligence. In fact I . . .'

"A finger held up suddenly, cut his thoughts in two.

"'Listen!' she whispered.

"A board creaked ominously in the hidden speaking chamber below them. He started to his feet but she put a forefinger over her lips. A stealthy movement now unmistakably from the lowest stair, caught his ear. She pointed to the glowing stone that formed the iris of the Image's strange eyes, and motioned for him to pry it out and give it to her. Again that stealthy movement, as if someone crept with silent menace up the stairs.

"'Prah?' His lips formed the word soundlessly.

"She nodded and snuffed out the ancient oil torch, even as she pointed anxiously at the glowing stone. Gnostes was annoyed. What did she want to bother with them for at such a time as this? Of course these relics were valuable and interesting, and he remembered that she had hinted that they held some sort of secret, but after all. . . . Half-reluctantly, he crossed to the darkened wall where the stones were glowing, and started to pry one loose. As the edge of it came out, he was startled to find that through the opening thus left, he saw below not an empty temple whose shining floor reflected back the glow of torches, but an immense throng of people, half-curious and half-afraid, who crowded in through every door and pressed toward the Image. Whirling back toward Thora, his words of warning were crushed by the sudden upheaval of a lighted torch thrust through the trap door at the top of the ladder-stairs from the speaking-chamber and followed by the yellow, leering face of Prah. Then, in the split second which followed, a glinting dagger flew toward the girl, and missing her, buried itself in the heavy curtains that draped the opposite wall. But even as she had dodged the dagger, she had drawn a vial of transparent liquid from her robe and had dashed it into his leering smile. As it struck his teeth, it spread over his face, turning his skin purple. For a moment he clawed at his face like a madman, and then, giving a strange gurgling yell, he fell backward down the stairs, the torch bounding after him and lighting the room with receding flares.

"For a moment they faced each other breathlessly in the darkness and then he whispered: 'The temple . . . look . . . they are here.'

"With a bound she had crossed the room, but it was with a bitterly disappointed voice that she answered:

"'No, Gnostes, those are earth-men. They are only the population of De that have been able to get in for the show. A goddess and her earthly lover are not killed every day, you know.'

"'I suppose not, though if the fools but knew it, you are not any more of a goddess than I am.'

"'They don't, but Prah has his suspicions. He hurled a dagger. But you must be able to recognize the men of Allos in case I . . . in case the next dagger . . .

"'I am vulnerable also, Thora.'

"'But you must listen. We have so little time now. The men of Allos are not human like us. They travel in machines here on our earth. . . . Listen! They are coming back! Give me the Iris-stone!'

"'Is it a weapon?'

"'Yes. I had hoped to get back before I had to use it, but that cannot be helped now. I will give them a surprise this time.'

"'What about all those people out there? We are two against a thousand.'

"'Fear is a wonderful weapon. In a moment they will leave screaming. But the priests may attack from two sides. Get that dagger out of the curtain and guard my back. There is an old forgotten entrance to this room behind those curtains.'

"As he handed Thora the stone, her fingers clasped around his for a moment. And it was with a singing heart that he went to get the dagger out of the curtains where Prah had hurled it. He groped into the tapestry eagerly but his hands found no dagger. It was gone!

"A wave of horror rushed over him as he realized that someone else was in that darkened room. Turning back to Thora, with the impulse to shield her with his own body until he could at least hear this new intruder, he was startled at the sight of two more faces thrust up the stairs behind another torch. In that same moment, Thora threw up her hands and gave the stone a quick twist. Immediately a green ray of peculiar penetration crackled through the air with a choking, acrid smell. The two priests straightened up, the look of startled surprise quickly becoming agony as their skin turned a ghastly green. Then, as Gnostes rubbed his eyes, they seemed to disappear—to simply fade into nothingness, while the torch flickered a moment uncertainly and then vanished—leaving the room again in total darkness. In the temple, Gnostes heard wails of mortal terror and the stampede of a thousand feet.

HARDLY did he have time to wonder what supernatural power this stone held, when several faces appeared on the stairs, in a desperate attempt to break through the withering wall of the Green Ray, and at the same moment he caught sight of something glinting out of the corner of his eye. Whirling around, he looked into the leering face of Prah, burned now like a raw steak in the flames, from which the cruel eyes gleamed maliciously. A long, curved knife glittered in his yellow claw. Reaching for the knife with more anger than cunning, Gnostes grasped empty space and winced as the cold blade bit through the flesh of his right arm and laid bare the bone. Hurling his left fist at the head-priest then, he felt the burned flesh of Prah tear beneath his knuckles as other arms gripped him from behind, and pinioned his arms. Wrenching himself loose again, he made another lunge at Prah, striking the startled head-priest full in the stomach and sending him, like a flying bag of grain, straight into Thora, who fell headlong down the steps upon the faces of the advancing priests and followed by Prah. Arms gripped him mercilessly and forced him down the stairs where Prah, cut and bleeding, ordered a lesser priest to hold a torch. Thora's hands were also pinioned now, while several men seemed to be searching the floor for her weapon. Her eyes were still fearless as they looked into his, seeming to signal courage.

"Gnostes was inclined to half-admire and half-mistrust her optimism. Did she still believe in these fantastic deliverers of hers? Even now that Prah had them both in his power? Even now that he was evidently preparing to torture them on the spot? As for himself, he knew that by the rate he was losing blood, it would be but a matter of time . . . but Thora? He glared at Prah with the snarl of the dying wolf in his throat, and the head-priest smiled back nastily.

"Ordering his men to give him the girl, Prah put a dagger in her hand and advanced toward Gnostes.

"'You thought he was handsome, did you? Is that why you liked this slave?'

"She tossed her head in the air and stared at him contemptuously.

"'Well, if that was the reason, then take a last look at him, for I am going to spoil his beauty, or rather, I am going to give you the pleasure of spoiling it yourself. First we will carve a line like this . . .' and dragging the struggling, fighting girl toward the young Greek, he plunged the dagger toward Gnostes' face. The blade slashed through his forehead and, just missing the eye, laid the cheek back to the bone.

"Through the red tint of the blood that ran into his eye, Gnostes saw Thora glance toward the temple. A mad look of delight swept into her eyes.

"'Let him go, Prah. Let him go and you will not be destroyed. It is the men of Allos!'

"'No, Goddess Thora, I have no fear of the illusions you bring forth to frighten the timid. Come, another cut . . . .'

"Gnostes saw the knife descending again, as Thora screamed:

"'Let him go or I will call for the ray that turns us into nothingness!'

"'You no longer have the weapon in your hand, beautiful one.'

"The knife came nearer and nearer, reaching, it seemed, toward his one clear eye.

"'Let him go, Prah! It is your last chance for life! See . . . they are inside the door!'

"The evil face seemed to blanch for a moment at what was hidden to Gnostes beyond the door. The patches of yellow skin which were not red and bloody grew an ashen grey, and then the eyes spat forth fire.

"'Your devils are but illusions! My answer is no!'

"Throwing back her head, she screamed out:

"'Bo-Kar! The death-ray! Follow my voice! Turn on the death-ray! And you, Gnostes—now you must carry on!'

"For a second, a blinding flash like a bolt of lightning turned everything to white flame. Thora and Prah seemed to shrivel up and disappear, while the men who held Gnostes, dropped his arms and fled screaming. Then it seemed to the wounded man, that everything swam crazily around, as the floor came up and hit him a terrific blow upon the head. The white flood of light was turned off at last and the bloody tinge of the wall glimmered out to total blackness. For a while he seemed to hear a buzzing noise at a great distance, but at last this too, dwindled away, leaving him to utter oblivion."

For a moment my friend leaned forward and stared into the coals of the fire, while I, suddenly aware, that I had been tensely listening to the tale of the fight, breathed a sigh that was partly relief and partly amusement over my own concern as I settled back again into the cushions of the divan. Yet, somehow, I could not help staring at his scarred face as he sat there. After all, a scar is not strange, and I have seen men with faces scarred more terribly than his. . . .

Perhaps it was that tense stare of mine that recalled him. He glanced at his pipe, which had long since gone out, and struck a match. I noticed that his fingers were trembling, as he drew in each breath of smoke slowly. Then tossing the match into the grate, he leaned for-

ward once more—puffing on his pipe quietly and brooding with weary eyes upon the spot where the match flamed for a moment like a tiny torch and then dropped a little blackened cinder, into the violet-red galleries of the coals.

"Thora!" he murmured half to himself. "Somehow she seemed more elfin than human. Thora, with her beauty that was occidental in the color of her hair and skin and oriental in the slight slant of her eyes; Thora, with her viewpoint that was a combination of the ancient sage and the modern scientist; Thora, with her vast knowledge and her timeless perspective—I wonder how many centuries she had probed before she met that heartsick lad who had once been a scholar of Pythagoras!"

I WAS wondering in a puzzled way about this strange malady of the mind which was evidently affecting my friend, for I noticed that he spoke of this creature of his imagination, not as a peg upon which to hang his story illustrating the relativist's doctrines, but as a real woman. Of course, this was an absurd fancy, I assured myself. Yet I realized that their absurd fancies were very real to the insane. Of course, if I allowed myself to actually believe . . . but safely skeptical once more, I smiled condescendingly and settled back among the pillows.

"The man we have chosen to call Gnostes awoke at last after many tortuous dreams and visions, in a swinging lounge suspended in a room that at first glance looked like a glass cage. Perhaps I had better mention something of these dreams for they were somewhat significant in the light of later events. He thought that he was again pinioned by the stairs and that Prah was dragging Thora toward him with that knife. Then came the blinding flash, and Thora vanished, but the head-priest, smiling that evil smile, slipped away behind the curtains of the speaking chamber. Time and time again the vision came and always Prah managed to evade the force of the death-ray. Therefore, when at last Gnostes found himself awake and sane once more, he did not notice the surroundings of his apartment particularly, but lay quiet, trying to settle in his mind definitely whether or not Prah actually escaped the destruction which Thora brought upon them.

"He was startled by a voice which seemed to whisper:

"'Do not waste your energy, creature-of-earth, upon those things which we are powerless to change.'

"After a moment of paralyzing astonishment, Gnostes realized that he had not heard the words, but that some strange force had apparently impressed them upon his mind.

"'Who was that and where are you?' he called.

"'Do not be alarmed,' came the answer. 'I am a creature of Allos, very different from you in appearance. When you will not be shocked and will regard me as a friend, I will come in. You have been too ill from poisoned wounds to be startled by the unusual, as your kind always are. Let it suffice that we communicate in this manner, and that we are as natural beings as you are or any of your world's animals.'

"'Then Thora was not mad! You are from the Blue World?'

"'We will discuss that when you awake from a longer sleep, man-of-earth. For the present, this is all.'

"Though Gnostes tried and tried to bring that impression back, he could not, and at last, weary with the sustained effort, he fell asleep.

"When he awoke a second time in the swinging couch after a heavy, dreamless sleep, he remembered that he was in the care of strange creatures, probably far from his own earth. Burning with curiosity, he attempted to rise, only to discover that he was amazingly thin and weak—a mere shadow of his former self. This surprised him for he thought he had been ill but a few days. Had it been longer? Afterwards he was inclined to think that it had. He moved to his side and called:

"'Man of Allos! Come in and talk to me. I have much to ask of you and I want to see you. Please come in now. I have slept a long time—a much longer time, in fact, than I would have cared to remain ignorant, had my will been consulted.'

"'Be content, I will come.'

"After what seemed interminable moments of waiting, Gnostes heard a slight rushing sound in what appeared to be the outer chamber of his room. The walls, which apparently were made of glass were a sort of silvery-blue in color, and quite impervious to the eye. Then a portion of the wall opposite to him seemed to part and a peculiar machine about three feet tall approached slowly. Again he heard the unspoken words:

"'I live upon a globe of far greater density and therefore heavier air pressure. I must wear this metal suit to protect the delicate organs of my body—especially those of my head, from being exploded in this thin air of yours. In like manner, I warn you that you must wear a metal suit when you decide to go into the rest of the ship where we live in comfort. Otherwise you will be crushed in the inrush of air. The noise you heard just now was the pumping chamber outside of your door which adjusts the air pressure for those entering and leaving. Do you understand all I am saying?'

"'Well, not exactly,' Gnostes admitted. 'You talk of density and air-pressure for instance. I think I grasp what you mean by the last term and I probably do in a fashion, for the rest of your explanations seem logical.'

"'What a shame to lose Thora! Ah, well, man-of-earth, I had forgotten that you had so much to learn. I will arrange for you to have a tutor right away. You will start studying as soon as the medical authorities advise. It will be some time before you can carry the heavy metal of your suit, so you must be content to stay in your room somewhat longer. I leave now. Your tutor, Hekanos, will follow me very shortly.'

"Though this creature seemed all intellect, the one assigned to Gnostes as his tutor soon showed him that all the men of Allos were not alike, for the first thing the new machine did was to question his charge upon the death of Thora and the fight in the temple. He was very much interested in the story of the Iris-stone as well, and took pains to probe for the minutest details concerning the manner in which Thora made use of the hidden ray.

"THE opportunity of speaking to some sympathetic creature about the death of that brave girl, and especially one who seemed to mourn her loss sincerely, formed a bond which drew a fellow feeling and a devotion from Gnostes as nothing else could have done. And so Gnostes and Hekanos soon became fast friends. It was the man of Allos who described the insane terror

of the people that night to take the mind of the boy into brighter channels.

"'But think of it, driving the space-ship of Allos right up to the temple. Why that is an incident that the world will never forget—never!'

"'No, my friend. Never is a ghost word. The world of earth will forget in a few centuries and if the men of a later age ever succeed in digging up and translating the libraries, such a tale of colored lights around a huge bird that rested in the city grounds and disgorged a swarm of devils, would be passed by as an unintelligent myth or religious legend whose significance has long been lost. You will some day learn that the past is full of such absurd tales—the absurdity of which is very apparent and the significance unapparent.'

"And Gnostes, having listened to Pythagoras and then to the far more astounding tales of Thora, was no longer inclined to scoff, but longed to carry his new knowledge back to Greece—the world's one kingdom of the intellect, at all times more friendly to the expanding thought of science than the solidified thought of creed. How little he suspected then that the world can not be told—it must experience for itself in order to believe."

Smead leaned forward and tapped the ashes from his pipe and laid it upon the table beside the empty ale glasses before he continued.

"So Gnostes gained not only a tutor, but also a friend, in this man of Allos. But upon the day that Hekanos presented him with the Iris-stone, the Greek was convinced that his liking for this queer-looking little creature was returned, for his tutor had told him before that one of the stones had already gone to the chemical laboratory in an attempt to make it yield its secret.

"'It is all I could give you that belonged to her,' the man of Allos said simply. 'We found it on the floor of the temple, close beside your unconscious body.'

"'It is the last of the Iris-stones?"

"Hekanos nodded.

"'The other one will soon yield its secret to the scientists of Allos. Then if another raid comes from these unknown creatures, we will be ready.'

"'But the earth, what about mankind?'

"'When the earth can use such knowledge without abusing it, we will enlighten them.'

"'Tell me, Hekanos, when will I be returned to earth?'

"'Do you desire to return very soon?'

"'Yes, there is a man . . .' he whispered, his voice thickening with hate.

"'Revenge is an unworthy object for the expenditure of energy.'

"'Yet I will not be happy until I can be certain that he is dead.'

"'Very well. I will see that you are returned after a short visit to the Blue World.'

"'Thank you, Hekanos.'

"'However, there will be some studies which you will be asked to master first.'

"'Will they take many years?'

"'If you are apt, they should not take longer than five tiara—as we call our years.'

"So Gnostes began his studies with an ardor that delighted his tutor. Being a natural scholar—one who loves wisdom for its own sake, he drank eagerly of all that was offered, dipping first into the physical sciences. It was natural, perhaps, that rays should fascinate him, and when he learned that the ship on which he was a passenger was propelled by means of a ray that not only negated gravity but actually harnessed it as a driving force to shoot the ship away from the globe it was leaving, he became very anxious to see the interior of the engine room with its massive controls and its telescopic eye as described by Hekanos.

"When at last the curious suit of armor was brought in, which he was to wear, Gnostes could hardly babble his delight for excitement. He noticed for the first time also, that Hekanos had a long, feeler-like arm that seemed to unroll from under the jaw somewhere, much as a butterfly carries its tongue. With this slender organ almost thread-like at the tip, he adjusted the suit of armor and then led Gnostes into the pumping room.

"'Never come into the pumping room without this armor, or the pressure would crush in your eyes and press through your ears into your brain.'

"Gnostes smiled thoughtfully, for these words evidently meant that soon he would be given the freedom of the ship and allowed to roam about at will. Hekanos caught the inference and nodded.

"As the door closed behind them, leaving them in darkness, Gnostes tried to peer through the heavy glass of his helmet, which had much resemblance to the modern deep-seat diving suit in its heavy, massive proportions. But the darkness was complete, until, after what seemed an endless period of waiting, a door on the opposite side of the wall opened and he found himself facing a room that reminded him of a vast aquarium. Through air of such murky heaviness that it looked more like water, he moved slowly, gazing from the luminescent plants that glowed softly like languorous silver decorations along the walls, to the living color of the creatures which seemed to swim toward him. Though he could now feel their vibrations of excitement and curiosity, yet they seemed to move with exaggerated ease and grace. Indeed he began to have the strange feeling that he was looking into a magic mirror, which slowed up all movements and made of each hurried action a poem of slow rhythm. He had ample time to observe and admire these delicate creatures before the nearest reached him.

"FORMED not unlike the fly, yet they had a beauty far beyond anything that despicable little insect could boast. Their bodies were covered with a down of turquoise blue dusted over with a frost of silver as if a bit of diamond dust clung to each individual hair. Their heads were covered with a plume-like mane of silver that shimmered with a pearly iridescence and changed subtly with every change in their thoughts. But perhaps loveliest of all, was their gossamer wings which were rainbow-like in their delicacy, even when folded upon their backs. In fancy, Gnostes imagined one of them spreading those fragile wings in a nocturnal, fairy world and drifting through the heavy air like a pearly fleck from some giant moon.

"It was Hekanos that recalled his thoughts by the contortions with which he divested himself of his heavy armor and smoothed down his plume with that thread-like tongue. Suddenly a golden light played lightly over the edges of that magnificent mane and Gnostes felt the thought-impression:

"'Yet more surprises await you in the control-room of the ship. Are you willing to see even stranger sights than we present by our appearance?'

"Gnostes nodded eagerly, but the movement under his cumbrous armor became one of stately gravity. Turning slowly, he followed Hekanos with ponderous steps, feeling that now indeed, he had entered that land of the magic mirror and must walk with languorous deliberation through this medium, which seemed unreal somehow—more like a world whose values had been warped by an unknown lens.

"As they followed winding tubular passageways of polished metal, reflecting in a thousand curves the luminous colors of Hekanos' body, Gnostes reflected that Thora had appeared to move with a sort of languorous grace even about the temple floor on earth. But these thoughts were brought to a close by entering another great chamber. Here, however, no phosphorescent plants draped themselves in the heavy air. Instead, tremendous motors throbbed, and shining pistons beat out a rhythm of motion. As Hekanos led him from one engine to another, explaining their functions, Gnostes caught sight of a great luminous disc in the center of the room, that kept turning slowly, and pressed a question about it.

" 'That is the eye of the ship. I told you about it when we were in your own room. It shows the space all around us. It is connected with various instruments of vision in the prow, around the sides and on the stern. If you stay here for many days, you may see some of the systems which we pass and globes in all stages of their life. Some will be molten, some gaseous, some green and some cloudy. We are nearing one that is dead. We call it Namoor. It is airless, like your moon. In the sunshine you would burn up and in the shade you would freeze. Behold it!'

"Gnostes watched the screen with fascinated interest as a great silver globe swung into sight. Endless plains, worn down by rivers that had long since dried up, glittered in the sunlight and led into a dry sea. As Gnostes followed the old coast line, he thought he made out the ruins of a towering city. Hekanos, sensitive to the new impression, verified his suspicions.

" 'Yes it is a city—or the ruins of one. The race died off or left the globe long before we attempted space-travel and we found it just as you see it now . . . a dead planet rolling through space with the ruins of its dead past—a perpetual tomb.'

"Gnostes frowned as a turn of the ship showed them the skeleton fingers of the building pointed against the dead plain. He could not have told why, but he shuddered and turned away from the screen, seeking out the instrument board instead.

"There Hekanos followed him and explained the speed-indicator, the meteor-finder and space-recorder.

" 'Space records are made by every space ship. Then, if something unforeseen happens, the rescuing party can tell the exact story of the accident to the master of records and the mistake will not be repeated. All records are kept of each and every trip and can be referred to at any time.'

" 'Your kind is very methodical,' he thought by way of comment, but he was becoming conscious of the fact that the armor seemed to be getting heavier and heavier.

"Hekanos seemed to sense his discomfort immediately.

" 'You are still a little weaker than I thought you were. Sit on the floor and I will have you carried to your room.'

" 'But why can I sit down instead of floating off? Why should the armor be heavy here in space? There is no gravity here,' he persisted as he sank to the floor.

" 'That is true, but we make use of some artificial gravity for our own comfort. We are used to even more than you are and we would be doubly uncomfortable without any.'

"But Gnostes, more weary than he suspected, had already drifted off to sleep. So ended his first tour of the space-ship from Allos."

Smead leaned over to stir the fire and I could not help thinking as I watched him, the glow suddenly lighting up the crevice of his scarred cheek, that there was something cat-like in his movements comparable to these luminous beings from the Blue World.

"But, Dr. Smead," I objected as he picked up the tongs and threw a couple of fresh coals on the fire, "would this man whom we have chosen to call Gnostes, not notice a warping of the time value by noting the slow movements?"

He looked up with that strange twisted smile.

"Why, certainly he would not notice a warping of the time value. He did notice the slow movements, but that was natural."

"How so?"

"Because you see," tossing on the black coals and shoving them over the red ones, "Gnostes was suddenly thrust into a heavier medium. If you think you can move quickly in a heavier medium, try running when you are above your waist in water."

"I stand corrected," I laughed. "Though if I wanted to press the argument, I would say that there are animals which can."

"And I would answer that the men of Allos were not of that type."

"All right, I raise the white flag of truce. What becomes of Gnostes?"

He laid down the tongs and came back to the divan. Seating himself among the pillows, he began with that reminiscent tone:

"Time is a dimension which seems to become rather elastic as soon as you get away from familiar landmarks. I dare say you have had the experience of being unable to judge the hour, even though you have had that familiar hour-glass, the sun, to go by. Imagine then, what a difficulty—in fact, I should say how impossible it would have been for Gnostes, who had no hour-glass at all—not even the day and night.

"After what might have been weeks or months of study and growing familiarity with the interior of the ship, during which time he had become increasingly sensitive to thought-impressions, he began to sense at last a subtle but constantly increasing excitement. Finally seeking out Hekanos, he asked the reason.

" 'I did not tell you because I wanted to see if you could feel it for yourself. We are nearing the Blue World.'

"Gnostes could hardly conceal the thrill that shot through him at this announcement. Seeking out the control-room again with Hekanos, he found a large group of the gleaming turquoise creatures gathered around the screen.

" 'Won't the size of the crowd interfere with the guiding of the ship when we start to land?'

" 'Certainly it would. But that is easily remedied in a manner that will keep everyone happy. A huge screen will be constructed in the center of the main hall. After

this Ur (waking time), no one will be allowed in the control-room.'

"HEKANOS was right, for the next time Gnostes entered the heavier atmosphere of the hall from his own glass cage, he found innumerable creatures at work on the giant screen. With languorous movements, only a little less slow than usual, they handed the parts from one to the other and passed them in a living line to the crew on top of the huge platform. Gnostes sat down and watched them as they put the monster machine together, not even stirring for his broth and capsules of nourishment, when he was informed that they were ready.

"When at last they were on the point of adjusting the great glass screen in place, Gnostes offered his services, but Hekanos would not allow him to move. The boy was annoyed.

"'I am no longer sick. I can help. In fact I am quite a bit larger than you are and therefore I should be much stronger.'

"'You would be if you lived on Allos, but as an earthman, you are not.'

"'I do not understand. What has that to do with it?'

"'Everything. You are built to withstand only a certain amount of gravity, therefore you have but a certain amount of strength according to your size. We are built to withstand a far greater amount of gravity. Therefore we have been given more strength for our size than you have, because you see, it takes a great deal to even move our weight on our planet.'

"Gnostes nodded.

"'And the inference is that I would be quite helpless on your globe?'

"'Exactly.'

"Gnostes did not relish this thought, but his interest in the machine which was being put together before him, gradually banished it from his mind. As the great screens were adjusted and bolted into place, and minor parts checked over, the crowd gathered about the instrument was asked to step back and the one in charge of the task gave the signal to turn on the current. In another moment the screens began to glow softly and soon a huge globe swung into sight. Gnostes forgot that he had learned thought-reading and asked out loud:

"'Is that the Blue World?'

"Hekanos nodded slowly.

"'Are we approaching its dark side?'

"'No. It is situated farther from its sun than your world. At one time it had a bright companion that was self-luminous and which gave it both light and heat, but the companion has cooled off and is now in the state of a mere molten body. Therefore, for countless generations, the men of Allos have manufactured their own light and heat. The companion looks like a great orange moon from Ultair, on the Blue World—the city to which we are going.'

"'If it had not been that its twin planet was hot, life probably would not have evolved on the Blue World?'

"'Probably not. It was too far from the sun to have the necessary amount of heat. Life needs two things in order to thrive at all—heat and moisture. Neptune, that planet of your own sun, which is so far out in space, for instance, has enough size to attract an atmosphere and therefore moisture, but it has too little heat for the support of life.'

"Gnostes, needless to say, had never heard of Neptune, which, by the way, Hekanos called by another name, but

"We greet you, creature-of-earth, we welcome you to the Land of Allos and the City of Ultair."

his ignorance was not allowed to continue for long. When they had concluded their study of this planet, and had turned back to the screen, the Blue World was very much closer.

"Gnostes could make out vast mountain-chains now that cast needle-pointed shadows across the perpetual blue, semi-twilight of the plains. Despite these evidences of fairly recent volcanic action, Hekanos assured him that Allos was older than the earth by countless millenniums.

"'And since we have learned the secrets of interstellar travel, we have increased our knowledge by as many more,' he added.

"But Gnostes scarcely paid any attention.

"'Look, Hekanos, what is that spot that looks like a great jewel glittering with sudden flashes of hidden fire?"

"'It is the city of Oupoteh which we pass on the way to Ultair.'

"'But how can it be a city? It looks like one solid gigantic blue-green emerald or jewel of strange beauty. It shines all over as if it had a surface and it is through this that those flashes are seen.'

"'Your eyes do not deceive you. It is a city under glass. All of our cities have that heavy glass dome and viewed from an interstellar space ship, they are surely a strange sight.'

"'But I do not understand. Why do the men of Allos live under glass?'

"'Don't you remember that I told you the planet had become too cold for comfort since its twin or companion about which it revolves, much as your moon swings about your earth, has cooled down? The men of Allos have manufactured their own heat and light for generations.'

"Gnostes was about to apologize for his stupidity, when he noticed that the city which Hekanos had called Oupoteh was swinging rapidly past. The ship was evidently coming down at a slant. More mountain chains were passed, and then vast fields which were also under glass, and lighted by what at their distance seemed to be more of these glowing plants.

"As they climbed over the sharp tips of the mountain chain, Gnostes saw a large lake-like dark blue volcanic glass, spreading into another glass-covered city with its internal flashes of colored fire.

"'Ultair?'

"Hekanos nodded.

"SLOWLY the ship circled toward the ground and curved its way gracefully along the plain toward the glass wall. Gnostes noticed from this new angle that a portion of the mountains, as well as a bit of the lake, were included under this glass dome, and concluded therefore that it was probably not only more important but also more picturesque than its sister city. Suddenly a portion of the heavy glass opened inward, and the ship nosed her way through the gate and into a series of giant glass locks, which like huge traps, opened one into the other.

"'Temperature traps.' Hekanos informed Gnostes and then, 'This one will open up into the city proper.'

"The temperature trap referred to was something larger than the rest, its curving sides glistening with the lights of the ship that it sheltered for a moment. Then again a great gate swung open before them and Gnostes saw the city of Ultair.

"Accustomed as he was now to the unusual, yet he was inclined to think later that his first glimpse of Ultair gave the thrill of a long and varied life to his soul. In consternation he stared from the twisted cane effect of some of these tremendous towers, to the gleaming crystal-like formation of others, made seemingly of a slightly luminous metal, so that they appeared to shine in the dark blue semi-twilight. Over their projected pavements and intersecting bridges swarmed a turquoise throng of living creatures whose glowing plumes gave a sprinkling of frosted silver light to their stream of motion.

"All this Gnostes seemed to see through a heavy blue haze, as if he had suddenly found himself in some unaccountable fashion upon the ocean floor, looking through the water at a weird, luminous illusion. The space above their ship had become but a deep-blue darkness, pierced only by hundreds of criss-crossing rays of various colors, probably guiding unseen air craft along their lanes of travel. From this darkness, throngs of winged turquoise creatures were continually coming and alighting upon the bridges, while other throngs were rising from the avenues of traffic and fading into the shadows above the towers.

"'The air must be dirty,' Gnostes thought, unconscious for the moment that his thoughts would be immediately read by Hekanos. He was not allowed to entertain that erroneous belief for long, however.

"'Not at all. On the contrary, the air is being continually washed chemically so that it will not be disease-laden. The bacterial life in the air of your cities make them particularly poisonous to us.'

"'Bacterial life?' Gnostes asked in puzzled surprise.

"'Oh, I had forgotten that we have not studied the biological sciences as yet, together.'

"It was characteristic of Hekanos to take the attitude that he, too, was but a scholar.

"As the ship swooped gracefully over the city, Gnostes could not shake off the sensation that he was on the ocean floor, looking through the soundless depths of the sea at a fairy-like ghost city, which might fade at any moment, leaving only cool, blue water waving through the twisted formations of a cavernous grotto which he could never explore.

"Winding its way through the towers with their ant-like lanes of traffic, which now flashed by in such bewildering closeness and succession that Gnostes first would see the corner of a suspended bridge flashed on the screen, followed by a swiftly expanding platform, the ship finally headed definitely toward the volcanic glass lake that spread to one side of the city. Gnostes noticed that this lake was of deepest midnight blue, upon which appeared to toss a sheen of changing peacock, tipped with a phosphorescent foam. This, too, expanded as the ship turned to land, and then suddenly the screen went blank. Gnostes realized it had been turned off, and as his companions moved away with that lazy grace which was characteristic of them, he also tried to rise. But he could not move. It was as if he had been paralyzed while watching the screen. His consternation was quickly noticed by Hekanos, who had not left his side.

"'You are feeling the effects of the increased gravitation.'

"'In other words, I must be moved about here and fed like a helpless lump of flesh, just as certain species of earth insects move and feed their large but helpless young?'

"'Yes, but in your own glass cage we have taken pains

to reduce the gravity in order that you can always have relief. You will also be given a small machine which will propel you anywhere. The mechanism of control is all under your hands. In the meantime we will carry you over the city. Are you ready to leave the ship?'

"As soon as Hekanos felt the impression of assent, he ordered two of the creatures standing near to lift Gnostes, which they did by swinging that slender feeler or tongue-like organ around the metal that encased his body and carrying him between them to a sort of open carriage that was standing in one corner. Gnostes had not noticed this contrivance before, but he had no time to examine it, as he was placed easily on the seat where he was made as comfortable as possible. Then as the two helpers moved lazily away, Hekanos climbed in beside him and touched a button. Gnostes felt a wave of terror within him when the thing began to move. Of all the strange things he had seen, this indeed seemed the most supernatural, perhaps because the thing was not alive, but made of metal, and unlike the space ship, he could see no engine or reason that it should move. It was Hekanos who composed him.

"'Do not worry—you are not crazy. The machine, which is a very common one, does move under its own power. I had simply forgotten to explain its engine or method of operation to you. But that is one of the things which we will discuss at another time. Behold! We are leaving the ship!'

"GNOSTES saw two great glass doors swing back in the curving glass wall opposite them. Almost instinctively he drew in a deep breath only to realize that he was encased behind metal, through which air was being passed to him by means of a tiny machine that checked the pressure.

"'I did not realize that we had landed yet, Hekanos. But since we have, I am most anxious to move about on solid ground again. The knowledge that I cannot is really a terrible thing.'

"'Thora felt the same way when we first brought her here. Finally she persuaded some of our engineers to construct her a private landscape in the mountains near a little lake. When you are tired of Ultair then, you only need to ask for this place and the pressure will be adjusted for you. In Thora's absence it has been used as a park, because the young greatly enjoyed the lesser gravity, and their subsequent increase in strength.'

"'You say that the gravity has been partly counteracted there?'

"'Yes, you will need neither armor suits nor runabout machines.'

"'To know that there is such a spot, Hekanos, takes the despair out of my mind and lets me look upon this visit to Ultair in the light of a wonderful adventure.' . . .

"'Good. That is the spirit of youth, Gnostes, the spirit we should never lose.'

"The vehicle was moving forward very slowly now, waiting its turn as throngs of shimmering turquoise bodies and rainbow wings pressed through the great opening. As the car crept nearer to the door, Gnostes caught sight of the twisted candy-cane city glowing in the background and then at last as they reached the blue haze of the outer air, he could look down the long suspended bridge to the lake below. But now that he could see it nearer, he realized that it was no lake upon which he had looked, when it was flashed upon the screen. The lake was in reality not a liquid but a great solidified plain of some dark-blue composition or volcanic glass, upon which the waves of peacock which he had seen tipped with phosphorescent froth, were untold multitudes of these creatures of Allos with their tossing, luminescent plumes forming an ever-changing, living sea of color.

"It is easy, I believe, even for those unused to thought-reading, to catch the temper of a vast crowd gathered for some occasion, though no words are heard. It was therefore doubly easy for Gnostes to grasp the impressions of not only curiosity but also of grief. And by this he knew that they had learned about the death of Thora.

"As he reached the foot of the bridge and the car moved up to a brilliant platform constructed of the softly glowing metal, Gnostes had the feeling that the individuals waiting there were going to question him. He was right. As the car moved slowly up the platform, the throngs that had come out ahead of them parted majestically, and he was ushered into the circle of light, as it were. As the machine came to a halt, he felt a very compelling voice say:

"'We greet you, creature-of-earth. We welcome you to the Land of Allos and the City of Ultair.'

"Gnostes returned the greetings from his heart for, perhaps particularly through Hekanos, he had become very fond of the graceful beings of living color.

"'We have learned of the tragic death of our child Thora, who passed away with the wish that we take you back in her place. Because of that last message, winged on the very death-ray that she called for, we have followed out her wishes, and you are here.'

"In a momentary flash of bitter memory, the boy recalled her words—'And you, Gnostes—now you must carry on.' That memory brought back a face that he had almost forgotten—that of Prah—with his smiling devil-smile.

"'What is it that you wish me to do?'

"'Go back to earth at stated intervals and keep up with their increase of knowledge. We do not pledge you to silence about your trip here, because you will never be believed, even if you do tell. Until the earth reaches a more peaceful stage, however, we ask that you keep the landing places of our ship a secret. Are you willing to do this?'

"'Yes. But I have one request. There is a man of whose death I must be certain.'

"'We have been informed of this desire . . . unworthy though we feel it to be. However, we also know that in this matter you will some day share our opinion. We can return you to earth at once or keep you here and teach you for a while. Would you be willing to stay and partake of some more of our knowledge before returning?'

"'A vision of the great Pythagoras seemed to rise before him.

"'Revenge can wait, creatures-of-Allos, if you will grant me permission to visit my native land again upon my next trip. But whether you grant that request or not, I am bound to add that revenge must wait.'

"A light of approbation rippled over the sea of irridescent plumes.

"'Well spoken, man-of-earth. So shall it be.'

"As if this had been the pass-word, the sea of luminous creatures began to break up into what seemed to be

giant waves of dazzling spray, but which was vast swarms winging their way into the blue haze that hung above. So surprised was Gnostes at this sudden departure of the waiting throngs, that he had not noticed that wings had unrolled from the sides of their little car as well. Therefore he was again startled as these thin, pearly appendages suddenly tilted up, blocking out his view for the moment, and the carriage rose easily into the air.

"Gracefully they flew to the city, where they alighted upon the curve of a wide bridge, and proceeded to a vast glowing door-way in one of the wider buildings. Passing through the lazily moving masses, along curving glass tunnels that reflected every movement of the gleaming traffic, they found themselves entering a hall of polished jet, along whose walls curled tall phosphorescent, silver plants like giant, fantastic frescoes. These plants seemed to be of the same type that he saw on the ship, except that they were far more massive, and could probably boast of a more venerable age.

"From this hall, he was taken to a room where his voice and portrait were recorded. Then after being asked to talk aloud into a small disc so that his voice might be heard through the entire land, he obeyed without a murmur. He had seen so many wonders by this time, that he would not have denied the supernatural powers of any disc, no matter what absurd thing they might tell him it would do.

"At the end of his speech, however, he began to droop somewhat, and Hekanos, watchfully observant of any signs of fatigue, waived all the other functions that had evidently been arranged, and hurried his charge off to a vast, luxurious glass cage, where he helped Gnostes climb out of his armor.

"AFTER his friend had gone, Gnostes wandered about for a few moments, looking over the hundreds of books and old scrolls that filled untold shelves, until finding himself at last nodding over one, he put it aside and stretched upon his swinging divan without bothering about the meal that was waiting for him on a marble table beyond. Thinking to rest himself for just a moment, he sank into a heavy, dreamless slumber that lasted who knows how long.

"So began the new life of Gnostes upon the Blue World, and it was not long before he was handling his run-about like a veteran of Allos, and easily discussing the mechanism of instruments which at first had seemed so incomprehensible.

"But though he accustomed himself readily to his new environment, yet there was one thing which he could not forget in spite of his interest in his studies, and that was Prah, the head-priest. He planned the details of his revenge with minute exactness during his hours of recreation, putting aside as quite unlikely the possibility of the man with that yellow parchment skin and devil-smile having been killed by the ray that struck Thora. Perhaps, because he wanted to wring the rascal's neck so badly, the probability of finding him alive and happy seemed more certain every time he contemplated the thought. Therefore he began to live for revenge and was as a result intoxicated with delight when Hekanos announced that the day of his return had at last been decided upon. Gnostes had tied his life upon revenge—revenge on Prah first and then upon his old masters of the slave-ship. But he had built his life upon an illusion. He had yet to learn that time is a dimension, which may be warped as other dimensions may be warped. This he learned, when he stood at last upon the ruins of De—a city that had been destroyed in the day of some past generation, and gathered the tales from some mumbling old inhabitants. Yet he stood there upon the crumbling mound of what had been the temple and looked out across that deserted harbor, a man still in the physical prime of his manhood. When he realized this, he shrank from going back to his native land—he who was but the ghost of a former generation.

"But he did go back, nevertheless, only to find his family long extinct and forgotten and new creeds flourishing in the old places of learning. Barbarians had not taken the country as yet but rumbles of distant thunder were heard, while in the west a new empire was rising whose armies were destined to trample over most of the civilized nations of that day—Rome. Heart-sick at the fanaticism of supposedly learned peoples, and the war-drums of barbaric ones, he turned back again to the lazy grace and scientific mind of the Blue World. Gnostes too, had suddenly gained perspective."

"Very interesting but entirely impossible," I commented. "You will remember that I said my credulity had a vanishing point. You have passed it."

Smead looked up at me with that twisted smile.

"And may I ask when that happened?"

"Certainly. It happened when Gnostes found himself in another century."

"You mean to say that you do not believe that such a thing is possible?"

"Of course not. I still maintain that time is absolute, or practically so."

"Yet you agreed that if a day should be slowed up a thousand times, we would not notice the difference, that is, if everything should be slowed up in proportion."

"True."

"And in taking a star of lower density, where gravity is very much less, you must admit that the pendulum would swing much slower. In other words, the clock would be actually retarded."

"Suppose I grant that the pendulum would swing more slowly. What of it? The clock simply would not be functioning correctly."

"There you are with your viewpoint that still clings to the mud of this earth. For a globe of this size and this density, it would not. For a globe of the size where it is ticking off the seconds, it certainly would. For the larger globe the atom is vibrating more slowly. Vital processes of all kinds would be retarded. In other words, we would actually grow old more slowly."

"Einstein has certainly made a convert out of you," I laughed.

"But man, that is common sense. You know that recent experiments all seem to bear out the theory that time is retarded in the presence of a gravitational field. The atom on the sun actually appears to vibrate more slowly."

"I admit that the lines do seem to shade toward the red, but there may be other reasons. And besides, even though I should grant the possibility that Gnostes would age at a slower rate in Allos, than he would—say in London, yet what about the interstellar journey? Even at the speed of a rifle bullet, a space-ship would take over a million years to go to the nearest star."

"But let us once more refer to Einstein. You admit

that recent experiments have proved that apparently velocity increases mass?"

"If you are referring to the beta particles which shoot off in B rays at velocities nearly that of light, I admit that the mass does seem to increase according to their velocity."

"Yet an observer stationed on a beta particle would not notice this warping of space because of the fact that all his measuring apparatus would also be warped in proportion."

"But what has that to do with time?"

"Time is also warped by velocity."

"How so?"

"A clock that is moved at a great velocity actually shows a shorter time of endurance than the stationary clock."*

"I have heard about these experiments. But if I argue that the instrument has been disturbed by the movement and therefore has not recorded properly, you will reply that it has recorded properly, for its velocity but not for ours, or in other words, that the moving clock has recorded properly for itself, while the stationary clock has recorded properly for itself only?"

"Exactly."

"And time, therefore, is slowed up according to speed?"

"Certainly. Or let us say that anything moving at the speed of light, which is the fastest of all possible† speeds, cannot age at all while it is traveling through space. In other words, when we see the light of Mizar, we see light that has traveled through space for about seventy-five years but it has not aged while it is going through that space. It is the same as when it left Mizar seventy-five years ago."

"You are not trying to tell me now that this spaceship had the speed of light, are you? You know that if mass keeps on increasing with velocity, the inference is that it would be infinite at the speed of light. Therefore a metal could hardly travel at such a speed."

"No, I did not say that it had the speed of light, though I must say that it had considerably more velocity than that of a rifle bullet. According to earth time, Gnostes took very long indeed to make the journey. According to Gnostes himself, who measured his time by that of the ship in which he found himself, the time was reasonably short."

"Well I must say that you make out a good case, Dr. Smead."

"The fantastic quality of Einstein's theory is a thing that disappears before the reason. That is why. And reason is what I always try to follow. It is reason that leads science: it is emotion that leads creed, and yet for all our boasted reason, man is still an emotional animal."

"But suppose you tell me what happened to Gnostes—that is, after he returned to the Blue World."

SMEAD leaned over and raked the coals thoughtfully.

"He retired to Thora's villa where a giant moon was wont to peer with a distorted face through the thick glass and splash its orange light along a dark blue lake. There he studied with Hekanos and later with other teachers. Finally he gave himself into the keeping of the hall of suspended animation from whence after awakening he was sent back to an earth stagnated in the dark ages. Disgusted enough to swear, he would never return; he spent much time in interstellar travel. On his next visit to Allos, he was informed that the earth showed signs of waking and it seemed that a visit in about a thousand years might be worth while. Accordingly, he again entered the hall of suspended animation and timed his awakening for some time in the earth's twentieth century."

"And do you think that this time he will find it interesting enough to remain?"

"No. There is too much information to be carried back to the Blue World. But he will come again soon—say in about two hundred years."

I was watching him thoughtfully as the flame-light danced about that scarred face.

"In the meantime, let us forget Gnostes. I asked you here tonight, not to narrate such a tale, but to ask a favor."

"And what may that be?"

"I have received word that I must leave rather unexpectedly tomorrow for the desert of Chili. It is a secret expedition and very dangerous. I may never come back. Now I don't know why I should have taken a fancy to you the other evening at the reception, but you impressed me as a man of your word. I could have made other arrangements, but since you seem to like my attempts with the paint brush, I am going to ask you if you would like to keep them for me indefinitely—with certain stipulations concerning their disposal at your death, that is, in case I never return to London?"

"Did you say that you were asking a favor? I think that you meant to say you were bestowing one."

He shrugged his shoulders.

"My works are still very crude. I only wish to keep them, because, even though I try to follow reason, I still remain an emotional animal."

"But why the plural? Is there another?" I asked, glancing at the slave in the picture, who seemed to fairly move in the semi-darkness.

"Yes, there is another. It is the portrait of a woman—the woman I loved. Though I have tried to cover her memory and crowd it out by travel and study, yet the pain of it haunts me always."

Once more he sat there staring at those violet-red galleries of the fire.

"But the provisions I am to make about them in my will—you have not . . . ."

He aroused himself slowly.

"Ah, yes. Of course—the provisions. You may consider them the fancies of a diseased mind. Consider them so if you wish, but carry them out. Do you promise to do this?"

"I would be liable to do anything to possess that painting. It is uncanny. Really, it almost seems alive."

"Do you promise?" he persisted.

"Yes."

"Very well. You will have them placed in the vault of a safe bank and instruct the institution to guard them well for the space of two hundred years."

"Two hundred years."

"Relinquishing them at the end of that time to no one but a man of the following description. He will wear dark glasses over his eyes, and he will disclose a

* Borel—Space and Time.

† Birkhoff—Origin, Nature and Influence of R. Also E. Cunningham—Prin. of R. Also Carmichael—Theory of R.

deep dagger scar in his right arm similar to this one." Rolling up his right sleeve, my friend bared a muscular arm that showed the deep imprint of a knife. "He will resemble me in features and in this slashing cut across my face, but he will be somewhat older than I am. Last of all, he will show the authorities a left ankle that bears the undeniable marks of a heavy shackle."

I tried to conceal any thoughts that might express themselves on my face as I rose.

"Then I may never see you again?"

"Probably not, Mr. Newtonian."

"I am afraid you have changed that name," and then with sudden earnestness: "You will not allow me to attempt any protection from the . . . danger?"

"No."

"Nor would you consider having me along for . . . company?"

He looked up with that twisted smile and rose lazily. "Not this time."

"And if you do not come back, may I organize a searching expedition?"

"It would be useless."

"Why?"

"You would find no trace of me."

"That would be very strange."

"But true, nevertheless."

I had started toward the door, but I hung back and turned around again.

"Would you answer a very childish question, Mr.—Relativist?"

"Certainly."

"What sun is circled by the Blue World?"

He smiled a slow, enigmatic smile.

"What does it matter? Perhaps we will say it swings like a dark cinder around the giant Sirius. Was it not recently that astro-physicists discovered an unknown metal of enormous density there—so heavy, indeed, that less than a teaspoonful would weigh a ton?"

* * * * * *

HE has been gone for two years now—that strange character my friend at the reception described as an "interesting mystery." He never came back from the desert of Chili.

Yet when the firelight in my library flickers on cold evenings upon the agonized face of a young galley slave, my eye inevitably drops to the heavy shackle around his left leg, and then wanders to the companion painting on the opposite wall. There in the torchlight of an ancient marble temple, a girl of pale beauty stands with arms outspread, her auburn hair gleaming in the glow of the light behind her, and her slightly tilted Oriental eyes filled with love. And yet it is not the girl who inevitably holds my attention, for it always wanders finally to the huge image of a woman's face resting on the silken paws of a tiger. It rests upon her because in the semi-darkness of the temple those unwinking eyes stare out as if glowing with hidden fire. . . .

Then as I turn back to the coals, I find myself wondering, always wondering—if in the silence of that bleak and almost unknown land, a monster space-ship came down upon the desert and carried him away. . . . Or if he is merrily adventuring fancy-free in some far corner of the earth and laughing over the memory of a gullible fool who actually believed the wildest tale he had ever yet tried to tell—even though he had warned the poor chap ahead of time that he had sometimes been called—The Prince of Liars.

THE END

Sonnet

A speck of life came from the deeps of space
To earth, and grew to such a wonderous thing
As aeons passed, that birds began to sing,
That flowers bloomed across earth's pleasant face
In wild confusion, and in every place
Was some bright bit of life. Now Man is king,
And all the earth in tribute soon will bring
Its gifts to aid Man in his upward race.

Proud Man, are you content in such an age
To be the master of a speck, a grain
Within infinity? To rule a cage
Wherein your father's bones have ever lain?
Up, up together, break these earthly bars,
And claim your ancient heritage, the stars!

—Albert Sidney

The Man who Saw the Future

By Edmond Hamilton

Author of "World Atavism," "Universe Wreckers," etc.

WHEN we stop to think of it, it is not so very surprising that people of even a few centuries back should have looked askance upon prophecies and even have burned the "prophet" at the stake as witch or sorcerer. We cannot conceive of anything beyond the experiences of generations preceding and including our own. Since the experiences of past generations were vastly limited in comparison to those of our present decades, it is perfectly natural that those things which were hazily foretold (and which have since been realized) should have been looked on in former days as supernatural and as visions conjured up by the devil. Today, when we see so many machines which former ages would have looked on as impossible, we still look somewhat contemptuously at anyone who dares intimate the possibility of something that is outside our immediate knowledge. There is nothing impossible in Hamilton's story, which, we might add, is of exceeding scientific interest, to say nothing of its value as entertainment.

JEAN DE MARSELAIT, Inquisitor Extraordinary of the King of France, raised his head from the parchments that littered the rude desk at which he sat. His glance shifted along the long, stone-walled, torchlit room to the file of mail-clad soldiers who stood like steel statues by its door. A word from him and two of them sprang forward.

"You may bring in the prisoner," he said.

The two disappeared through the door and in moments more came a clang of opening bolts and grating of heavy hinges from somewhere in the building. Then the clang of the returning soldiers, and they entered the room with another man between them whose hands were fettered.

He was a straight figure, and was dressed in drab tunic and hose. His dark hair was long and straight, and his face held a dreaming strength, altogether different from the battered visages of the soldiers or the changeless mask of the Inquisitor. The latter regarded the prisoner for a moment, and then lifted one of the parchments from before him and read from it in a smooth, clear voice.

"Henri Lothiere, apothecary's assistant of Paris," he read, "is charged in this year of our lord one thousand four hundred and forty-four with offending against God and the king by committing the crime of sorcery."

The prisoner spoke for the first time, his voice low but steady. "I am no sorcerer, sire."

Jean de Marselait read calmly on from the parchment. "It is stated by many witnesses that for long that part of Paris, called Nanley by some, has been troubled by works of the devil. Ever and anon great claps of thunder have been heard issuing from an open field there without visible cause. They were evidently caused by a sorcerer of power since even exorcists could not halt them.

"It is attested by many that the accused, Henri Lothiere, did in spite of the known diabolical nature of the thing, spend much time at the field in question. It is also attested that the said Henri Lothiere did state that in his opinion the thunderclaps were not of diabolical origin, and that if they were studied, their cause might be discovered.

"It being suspected from this that Henri Lothiere was himself the sorcerer causing the thunderclaps, he was watched and on the third day of June was seen to go in the early morning to the unholy spot with certain instruments. There he was observed going through strange and diabolical conjurations, when there came suddenly another thunderclap and the said Henri Lothiere did vanish entirely from view in that moment. This fact is attested beyond all doubt.

Illustrated by MOREY

"Mother of God, what a city!"

"The news spreading, many hundreds watched around the field during that day. Upon that night, before midnight, another thunderclap was heard and the said Henri Lothiere was seen by these hundreds to appear at the field's center as swiftly and as strangely as he had vanished. The fear-stricken hundreds around the field heard him tell them how, by diabolical power, he had gone for hundreds of years into the future, a thing surely possible only to the devil and his minions, and heard him tell other blasphemies before they seized him and brought him to the Inquisitor of the King, praying that he be burned and his work of sorcery thus halted.

"Therefore, Henri Lothiere, since you were seen to vanish and to reappear as only the servants of the evil one might do, and were heard by many to utter the blasphemies mentioned, I must adjudge you a sorcerer with the penalty of death by fire. If anything there be that you can advance in palliation of your black offense, however, you may now do so before final sentence is passed upon you."

Jean de Marselait laid down the parchment, and raised

his eyes to the prisoner. The latter looked round him quickly for a moment, a half-glimpsed panic for an instant in his eyes, then seemed to steady.

"Sire, I cannot change the sentence you will pass upon me," he said quietly, "yet do I wish well to relate once, what happened to me and what I saw. Is it permitted me to tell that from first to last?"

The Inquisitor's head bent, and Henri Lothiere spoke, his voice gaining in strength and fervor as he continued.

"SIRE, I, Henri Lothiere, am no sorcerer but a simple apothecary's assistant. It was always my nature, from earliest youth, to desire to delve into matters unknown to men; the secrets of the earth and sea and sky, the knowledge hidden from us. I knew well that this was wicked, that the Church teaches all we need to know and that heaven frowns when we pry into its mysteries, but so strong was my desire to know, that many times I concerned myself with matters forbidden.

"I had sought to know the nature of the lightning, and the manner of flight of the birds, and the way in which fishes are able to live beneath the waters, and the mystery of the stars. So when these thunderclaps began to be heard in the part of Paris in which I lived, I did not fear them so much as my neighbors. I was eager to learn only what was causing them, for it seemed to me that their cause might be learned.

"So I began to go to that field from which they issued, to study them. I waited in it and twice I heard the great thunderclaps myself. I thought they came from near the field's center, and I studied that place. But I could see nothing there that was causing them. I dug in the ground, I looked up for hours into the sky, but there was nothing. And still, at intervals, the thunderclaps sounded.

"I still kept going to the field, though I knew that many of my neighbors whispered that I was engaged in sorcery. Upon that morning of the third day of June, it had occurred to me to take certain instruments, such as loadstones, to the field, to see whether anything might be learned with them. I went, a few superstitious ones following me at a distance. I reached the field's center, and started the examinations I had planned. Then came suddenly another thunderclap and with it I passed from the sight of those who had followed and were watching, vanished from view.

"Sire, I cannot well describe what happened in that moment. I heard the thunderclap come as though from all the air around me, stunning my ears with its terrible burst of sound. And at the same moment that I heard it, I was buffeted as though by awful winds and seemed falling downward through terrific depths. Then through the hellish uproar, I felt myself bumping upon a hard surface, and the sounds quickly ceased from about me.

"I had involuntarily closed my eyes at the great thunderclap, but now, slowly, I opened them. I looked around me, first in stupefaction, and then in growing amazement. For I was not in that familiar field at all, Sire, that I had been in a moment before. I was in a room, lying upon its floor, and it was such a room as I had never seen before.

"Its walls were smooth and white and gleaming. There were windows in the walls, and they were closed with sheets of glass so smooth and clear that one seemed looking through a clear opening rather than through glass. The floor was of stone, smooth and seamless as though carven from one great rock, yet seeming not, in some way, to be stone at all. There was a great circle of smooth metal inset in it, and it was on it that I was lying.

"All around the room were many great things the like of which I had never seen. Some seemed of black metal, seemed contrivances or machines of some sort. Black cords or wires connected them to each other and from part of them came a humming sound that did not stop. Others had glass tubes fixed on the front of them, and there were square black plates on which were many shining little handles and buttons.

There was a sound of voices, and I turned to find that two men were bending over me. They were men like myself, yet they were at the same time like no men I had ever met! One was white-bearded and the other plump and bare of face. Neither of them wore cloak or tunic or hose. Instead they wore loose and straight-hanging garments of cloth.

"They were both greatly excited, it seemed, and were talking rapidly to each other as they bent over me. I caught a word or two of their speech in a moment, and found it was French they were talking. But it was not the French I knew, being so strange and with so many new words as to be almost a different language. I could understand the drift, though, of what they were saying.

"'We have succeeded!' the plump one was shouting excitedly. 'We've brought someone through at last!'

"'They will never believe it,' the other replied. 'They'll say it was faked.'

"'Nonsense!' cried the first. 'We can do it again, Rastin; we can show them before their own eyes!'

"They bent toward me, seeing me staring at them.

"'Where are you from?' shouted the plump-faced one. 'What time—what year—what century?'

"'He doesn't understand, Thicourt,' muttered the white-bearded one. 'What year is this now, my friend?' he asked me.

"I found voice to answer. 'Surely, sirs, whoever you be, you know that this is the year fourteen hundred and forty-four,' I said.

"That set them off again into a babble of excited talk, of which I could make out only a word here and there. They lifted me up, seeing how sick and weak I felt, and seated me in a strange, but very comfortable chair. I felt dazed. The two were still talking excitedly, but finally the white-bearded one, Rastin, turned to me. He spoke to me, very slowly, so that I understood him clearly, and he asked me my name. I told him.

"'Henri Lothiere,' he repeated. 'Well, Henri you must try to understand. You are not now in the year 1444. You are five hundred years in the future, or what would seem to you the future. This is the year 1944.'

"'And Rastin and I have jerked you out of your own time across five solid centuries,' said the other, grinning.

"I looked from one to the other. 'Messieurs,' I pleaded, and Rastin shook his head.

"'He does not believe,' he said to the other. Then to me, 'Where were you just before you found yourself here, Henri?' he asked.

"'In a field at the outskirts of Paris,' I said.

"'Well, look from that window and see if you still believe yourself in your fifteenth century Paris,' he told me.

"I WENT to the window. I looked out. Mother of God, what a sight before my eyes! The familiar gray little houses, the open fields behind them, the saunterers in the dirt streets—all these were gone and it was a new and terrible city that lay about me! Its broad streets were of stone and great buildings of many levels rose on either side of them. Great numbers of people, dressed like the two beside me, moved in the streets and also strange vehicles or carriages, undrawn by horse or ox, that rushed to and fro at undreamed-of speed! I staggered back to the chair.

"'You believe now, Henri?' asked the white-beard, Rastin, kindly enough, and I nodded weakly. My brain was whirling.

"He pointed to the circle of metal on the floor and the machines around the room. 'Those are what we used to jerk you from your own time to this one,' he said.

"'But how, sirs?' I asked. 'For the love of God, how is it that you can take me from one time to another? Have ye become gods or devils?'

"'Neither the one nor the other, Henri,' he answered. 'We are simply scientists, physicists—men who want to know as much as man can know and who spend our lives in seeking knowledge.'

"I felt my confidence returning. These were men such as I had dreamed might some day be. 'But what can you do with time?' I asked. 'Is not time a thing unalterable, unchanging?'

"Both shook their heads. 'No, Henri, it is not. But lately have our men of science found that out.'

"They went on to tell me of things that I could not understand. It seemed they were telling that their men of knowledge had found time to be a mere measurement, or dimension, just as length or breadth or thickness. They mentioned names with reverence that I had never heard—Einstein and De Sitter and Lorentz. I was in a maze at their words.

"They said that just as men use force to move or rotate matter from one point along the three known measurements to another, so might matter be rotated from one point in time, the fourth measurement, to another, if the right force were used. They said that their machines produced that force and applied it to the metal circle. They had set the force to rotate any matter on the circle from five hundred years before to this time of theirs.

"They had tried it many times, they said, but nothing had been on the spot at that time and they had rotated nothing but the air above it from the one time to the other, and the reverse. I told them of the thunderclaps that had been heard at the spot in the field and that had made me curious. They said that they had been caused by the changing of the air above that spot from the one time to the other in their trials. I could not understand these things.

"They said then that I had happened to be on the spot when they had again turned on their force and so had been rotated out of my own time into theirs. They said that they had always hoped to get someone living from a distant time in that way, since a living man from the past would be a proof to all the other men of knowledge of what they had been able to do.

"I could not comprehend, and they saw and told me not to fear, I was not fearful, but excited at the things that I saw around me. I asked of those things and Rastin and Thicourt laughed and explained some of them to me as best they could. Much they said that I did not understand but my eyes saw marvels in that room of which I had never dreamed.

"They showed me a thing like a small glass bottle with wires inside, and then told me to touch a button beneath it. I did so and the bottle shone with a brilliant light exceeding that of scores of candles. I shrank back, but they laughed, and when Rastin touched the button again, the light in the glass thing vanished. I saw that there were many of these things in the ceiling of the room and on the walls.

"They showed me also a rounded black object of metal with a wheel at the end. A belt ran around the wheel and around smaller wheels connected to many machines. They touched a lever on this object and a sound of humming came from it and the wheel turned very fast, turning all the machines with the belt. It turned far faster than any man could ever have turned it, yet when they touched the lever again, its turning ceased. They said that it was the power of the lightning in the skies that they used to make the light and to turn that wheel!

"My brain reeled at the wonders that they showed. One took an instrument from the table that he held to his face, saying that he would summon the other scientists or men of knowledge to see their experiment that night. He spoke into the instrument as though to different men, and let me hear voices from it answering him! They said that the men who answered were leagues separated from him!

"I could not believe—and yet somehow I did believe! I was half-dazed with wonder and yet excited too. The white-bearded man, Rastin, saw that, and encouraged me. Then they brought a small box with an opening and placed a black disk on the box, and set it turning in some way. A woman's voice came from the opening of the box, singing. I shuddered when they told me that the woman was one who had died years before. Could the dead speak thus?

"HOW can I describe what I saw there? Another box or cabinet there was, with an opening also. I thought it was like that from which I had heard the dead woman singing, but they said it was different. They touched buttons on it and a voice came from it speaking in a tongue I knew not. They said that the man was speaking thousands of leagues from us, in a strange land across the uncrossed western ocean, yet he seemed speaking by my side!

"They saw how dazed I was by these things, and gave me wine. At that I took heart, for wine, at least, was as it had always been.

"'You will want to see Paris—the Paris of our time, Henri?' asked Rastin.

"'But it is different—terrible——' I said.

"'We'll take you,' Thicourt said, 'but first your clothes——'

"He got a long light coat that they had me put on, that covered my tunic and hose, and a hat of grotesque round shape that they put on my head. They led me then out of the building and into the street.

"I gazed astoundedly along that street. It had a raised walk at either side, on which many hundreds of people moved to and fro, all dressed in as strange a fashion. Many, like Rastin and Thicourt, seemed of gentle blood, yet, in spite of this, they did not wear a sword or even

a dagger. There were no knights or squires, or priests or peasants. All seemed dressed much the same.

"Small lads ran to and fro selling what seemed sheets of very thin white parchment, many times folded and covered with lettering. Rastin said that these had written in them all things that had happened through all the world, even but hours before. I said that to write even one of these sheets would take a clerk many days, but they said that the writing was done in some way very quickly by machines.

"In the broad stone street between the two raised walks were rushing back and forth the strange vehicles I had seen from the window. There was no animal pulling or pushing any one of them, yet they never halted their swift rush, and carried many people at unthinkable speed. Sometimes those who walked stepped before the rushing vehicles, and then from them came terrible warning snarls or moans that made the walkers draw back.

"One of the vehicles stood at the walk's edge before us, and we entered it and sat side by side on a soft leather seat. Thicourt sat behind a wheel on a post, with levers beside him. He touched these and a humming sound came from somewhere in the vehicle and then it too began to rush forward. Faster and faster along the street it went, yet neither of them seemed afraid.

"Many thousands of these vehicles were moving swiftly through the streets about us. We passed on, between great buildings and along wider streets, my eyes and ears numbed by what I saw about me. Then the buildings grew smaller, after we had gone for miles through them, and we were passing through the city's outskirts. I could not believe, hardly, that it was Paris in which I was.

"We came to a great flat and open field outside the city and there Thicourt stopped and we got out of the vehicle. There were big buildings at the field's end, and I saw other vehicles rolling out of them across the field, ones different from any I had yet seen, with flat winglike projections on either side. They rolled out over the field very fast and then I cried out as I saw them rising from the ground into the air. Mother of God, they were flying! The men in them were flying!

"Rastin and Thicourt took me forward to the great buildings. They spoke to men there and one brought forward one of the winged cars. Rastin told me to get in, and though I was terribly afraid, there was too terrible a fascination that drew me in. Thicourt and Rastin entered after me, and we sat in seats with the other man. He had before him levers and buttons, while at the car's front was a great thing like a double-oar or paddle. A loud roaring came and that double-blade began to whirl so swiftly that I could not see it. Then the car rolled swiftly forward, bumping on the ground, and then ceased to bump. I looked down, then shuddered. The ground was already far beneath! I too, was flying in the air!

"We swept upward at terrible speed, that increased steadily. The thunder of the car was terrific, and as the man at the levers changed their position, we curved around and over downward and upward as though birds. Rastin tried to explain to me how the car flew, but it was all too wonderful, and I could not understand. I only knew that a wild thrilling excitement held me, and that it were worth life and death to fly thus, if but for once, as I had always dreamed that men might some day do.

"Higher and higher we went. The earth lay far beneath and I saw now that Paris was indeed a mighty city, its vast mass of buildings stretching away almost to the horizons below us. A mighty city of the future that it had been given my eyes to look on!

"There were other winged cars darting to and fro in the air about us, and they said that many of these were starting or finishing journeys of hundreds of leagues in the air. Then I cried out as I saw a great shape coming nearer us in the air. It was many rods in length, tapering to a point at both ends, a vast ship sailing in the air! There were great cabins on its lower part and in them we glimpsed people gazing out, coming and going inside, dancing even! They told me that vast ships of the air like this sailed to and fro for thousands of leagues with hundreds inside them.

"The huge vessel of the air passed us and then our winged car began to descend. It circled smoothly down to the field like a swooping bird, and, when we landed there, Rastin and Thicourt led me back to the ground-vehicle. It was late afternoon by then, the sun sinking westward, and darkness had descended by the time we rolled back into the great city.

"But in that city was not darkness! Lights were everywhere in it, flashing brilliant lights that shone from its mighty buildings and that blinked and burned and ran like water in great symbols upon the buildings above the streets. Their glare was like that of day! We rode through these lanes of lights and stopped before a great building into which Rastin and Thicourt led me.

"It was vast inside and in it were many people in rows on rows of seats. I thought it a cathedral at first but saw soon that it was not. The wall at one end of it, toward which all in it were gazing, had on it pictures of people, great in size, and those pictures were moving as though themselves alive! And they were talking one to another, too, as though with living voices! I trembled. What magic!

"With Rastin and Thicourt in seats beside me, I watched the pictures enthralled. It was like looking through a great window into strange worlds. I saw the sea, seemingly tossing and roaring there before me, and then saw on it a ship, a vast ship of size incredible, without sails or oars, holding thousands of people. I seemed on that ship as I watched, seemed moving forward with it. They told me it was sailing over the western ocean that never men had crossed. I feared!

"Then another scene, land appearing from the ship. A great statue, upholding a torch, and we on the ship seemed passing beneath it. They said that the ship was approaching a city, the city of New York, but mists hid all before us. Then suddenly the mists before the ship cleared and there before me seemed the city.

"MOTHER of God, what a city! Climbing range on range of great mountain-like buildings that aspired up as though to scale heaven itself! Far beneath narrow streets pierced through them and in the picture we seemed to land from the ship, to go through those streets of the city. It was an incredible city of madness! The streets and ways were mere chasms between the sky-toppling buildings! People—people—people—millions on millions of them rushed through the endless streets. Countless ground-vehicles rushed to and fro also, and other different ones that roared above the streets and still others below them!

"Winged flying-cars and great airships were sailing to and fro over the titanic city, and in the waters around it great ships of the sea and smaller ships were coming and going. They sailed beneath colossal bridges, such as man never dreamed of surely, that reached out from the mighty city on all sides. And with the coming of darkness, the city blazed with living light!

"The pictures changed, showed other mighty cities, though none so terrible as that one. It showed great mechanisms that appalled me. Giant metal things that scooped in an instant from the earth as much as a man might dig in days. Vast things that poured molten metal from them like water. Others that lifted loads that hundreds of men and oxen could not have stirred.

"They showed men of knowledge like Rastin and Thicourt beside me. Some were healers, working miraculous cures in a way that I could not understand. Others were gazing through giant tubes at the stars, and the picture showed what they saw, showed that all of the stars were great suns like our sun, and that our sun was greater than earth, that earth moved around it instead of the reverse! How could such things be, I wondered. Yet they said that it was so, that earth was round like an apple, and that with other earths like it, the planets, moved round the sun. I heard, but could scarce understand.

"At last Rastin and Thicourt led me out of that place of living pictures and to their ground-vehicle. We went again through the streets to their buildings, where first I had found myself. As we went I saw that none challenged my right to go, nor asked who was my lord. And Rastin said that none now had lords, but that all were lord, king and priest and noble, having no more power than any in the land. Each man was his own master! It was what I had hardly dared to hope for, in my own time, and this, I thought, was greatest of all the marvels they had shown me!

"We entered again their building but Rastin and Thicourt took me first to another room than the one in which I had found myself. They said that their men of knowledge were gathered there to hear of their feat, and to have it proved to them.

"'You would not be afraid to return to your own time, Henri?' asked Rastin, and I shook my head.

"'I want to return to it,' I told them. 'I want to tell my people there what I have seen—what the future is that they must strive for.'

"'But if they should not believe you?' Thicourt asked.

"'Still I must go—must tell them,' I said.

"Rastin grasped my hand. 'You are a man, Henri,' he said. Then, throwing aside the cloak and hat I had worn outside, they went with me down to the big white-walled room where first I had found myself.

"It was lit brightly now by many of the shining glass things on ceiling and walls, and in it were many men. They all stared strangely at me and at my clothes, and talked excitedly so fast that I could not understand. Rastin began to address them.

"He seemed explaining how he had brought me from my own time to his. He used many terms and words that I could not understand, incomprehensible references and phrases, and I could understand but little. I heard again the names of Einstein and De Sitter that I had heard before, repeated frequently by these men as they disputed with Rastin and Thicourt. They seemed disputing about me.

"One big man was saying, 'Impossible! I tell you, Rastin, you've faked this fellow!'

"Rastin smiled. 'You don't believe that Thicourt and I brought him here from his own time across five centuries?'

"A chorus of excited negatives answered him. He had me stand up and speak to them. They asked me many questions, part of which I could not understand. I told them of my life, and of the city of my own time, and of king and priest and noble, and of many simple things that they seemed quite ignorant of. Some appeared to believe me but others did not, and again their dispute broke out.

"'There is a way to settle the argument, gentlemen,' said Rastin finally.

"'How?' all cried.

"'Thicourt and I brought Henri across five centuries by rotating the time-dimensions at this spot,' he said. 'Suppose we reverse that rotation and send him back before your eyes—would that be proof?'

"They all said that it would. Rastin turned to me. 'Stand on the metal circle, Henri,' he said. I did so.

"All were watching very closely. Thicourt did something quickly with the levers and buttons of the mechanisms in the room. They began to hum, and blue light came from the glass tubes on some. All were quiet, watching me as I stood there on the circle of metal. I met Rastin's eyes and something in me made me call goodbye to him. He waved his hand and smiled. Thicourt pressed more buttons and the hum of the mechanisms grew louder. Then he reached toward another lever. All in the room were tense and I was tense.

Then I saw Thicourt's arm move as he turned one of the many levers.

"A terrific clap of thunder seemed to break around me, and as I closed my eyes before its shock, I felt myself whirling around and falling at the same time as though into a maelstrom, just as I had done before. The awful falling sensation ceased in a moment and the sound subsided. I opened my eyes. I was on the ground at the center of the familiar field from which I had vanished hours before, upon the morning of that day. It was night now, though, for that day I had spent five hundred years in the future.

"There were many people gathered around the field, fearful, and they screamed and some fled when I appeared in the thunderclap. I went toward those who remained. My mind was full of the things I had seen and I wanted to tell them of these things. I wanted to tell them how in the future would be the marvels that my eyes had beheld, and of the freedom that I had seen those people of the future have. I wanted to tell them how they must work ever toward that future time of wonder.

"But they did not listen. Before I had spoken minutes to them they cried out on me as a sorcerer and a blasphemer, and seized me and brought me here to the Inquisitor, to you, sire. And to you, sire, I have told the truth in all things. I know that in doing so I have set the seal on my own fate, and that only sorcerer would ever tell such a tale, yet despite that I am glad. Glad that I have told one at least of this time of what I saw five centuries in the future. Glad that I saw! Glad that I saw the things that someday, sometime, must come to be——"

(*Continued on page* 658)

Skylark Three

The Tale of the Galactic Cruise Which Ushered in Universal Civilization

(A Serial in Three Parts) Part III

IT has been a source of increasing wonder to us how one man could conceive so many new and original ideas mathematically arrived at and based on good science in the space of one story—even if it is of novel length. So it is not altogether surprising that, despite the fact that the first installment of "Skylark Three" has been available to its anxiously waiting readers for only two weeks at this writing, we have already received a raft of letters containing, what almost seemed to us to have become a universal phrase: "I thought 'The Skylark of Space' was the best story you ever published until I read the first installment of 'Skylark Three'". Yet when we say that the second installment of this story was better than the first and that the concluding chapters are still more thrilling, we are only mildly preparing you for what there is in store for you in this issue. The best that we might say seems to us only a gesture.

You must read it for yourself.

What Went Before

DuQUESNE, a villainous member of the Steel Corporation, and a scientist, is bent on obtaining the secret of metal "X," a discovery made by Richard Seaton, another scientist, who has thus far successfully retained the secret against tremendous odds. DuQuesne leaves on an extended trip, on an apparently secret mission—secret even from the great Steel Corporation.

Richard Seaton knows of DuQuesne's desire for this metal "X" and he safeguards himself and his associates in some measure by following the needle of an object-compass, specially devised to keep tabs on any one person within a radius of tremendous length—the needle pointing constantly at the distant person and following his movements. For a while, however, DuQuesne goes far away and beyond the scope of this instrument.

DuQuesne, having been foiled several times in an attempt to kill Seaton, starts out for Osnome and intergalactic planets. His partner on this trip is a young, blond man, only recently connected with "Steel," and purposely trained by DuQuesne for this trip. He is called "Baby Doll" Loring.

Dunark, of the Green Planet of Osnome, visits the earth, with Sitar, and tells of a fight to a finish with the Kondalian nation, and asks for salt, which is rare in Osnome, in exchange for the metal "X" which is plentiful there. The Mardonalians, he tells the earth people, have already been exterminated by the Kondalians.

After considerable discussion, Seaton, Martin Crane, who is his partner, and their respective wives start back with Dunark and Sitar. The earth people go in *Skylark Three*, their own newly completed space vessel. *Skylark Three* is thoroughly equipped for a long and distant trip and carries with it crew and cook.

On this trip, Seaton and Crane take with them an entirely new weapon, which they call the "Zone of Force," an impenetrable ray, devastating to the body at which it is directed. They get an opportunity to test it out—successfully—when they meet the ship of the Fenachrone, a vanguard from another universe, preparing for the entire annihilation of the Green Planets. Seaton, with the aid of his knowledge of transmission equipment, secures the plans of the Fenachrone, then goes back to have a conference with the Osnomian and Kondalian chiefs and succeeds in getting them to promise to forget their grievances against each other and join with him in a battle against this universal enemy, who has laid plans to destroy or conquer every people on every planet which they can possibly reach. Both these nations contribute the best they have in the way of destruction equipment and protective material and give Seaton further information necessary to a successful conquest of the Fenachrone. First they visit the Porpoise-Men of Dasor, whose planet, or the half which they can see, is "solid ocean." This race of porpoise-men, however, are highly advanced in the realm of chemistry, physics and mathematics, and exchange valuable information and material for a quantity of the metal "X" which Seaton gladly gives them. After they have done all they could on Dasor, they go to Planet Six, otherwise known as Norlamin, where they obtain the necessary aid in the matter of rays, besides being shown some of the marvels of a people thousands upon thousands of years ahead of the earth in physical and electrical science. It is on Norlamin that they make their final preparations for battle.

CHAPTER X (Continued)

Norlaminian Science

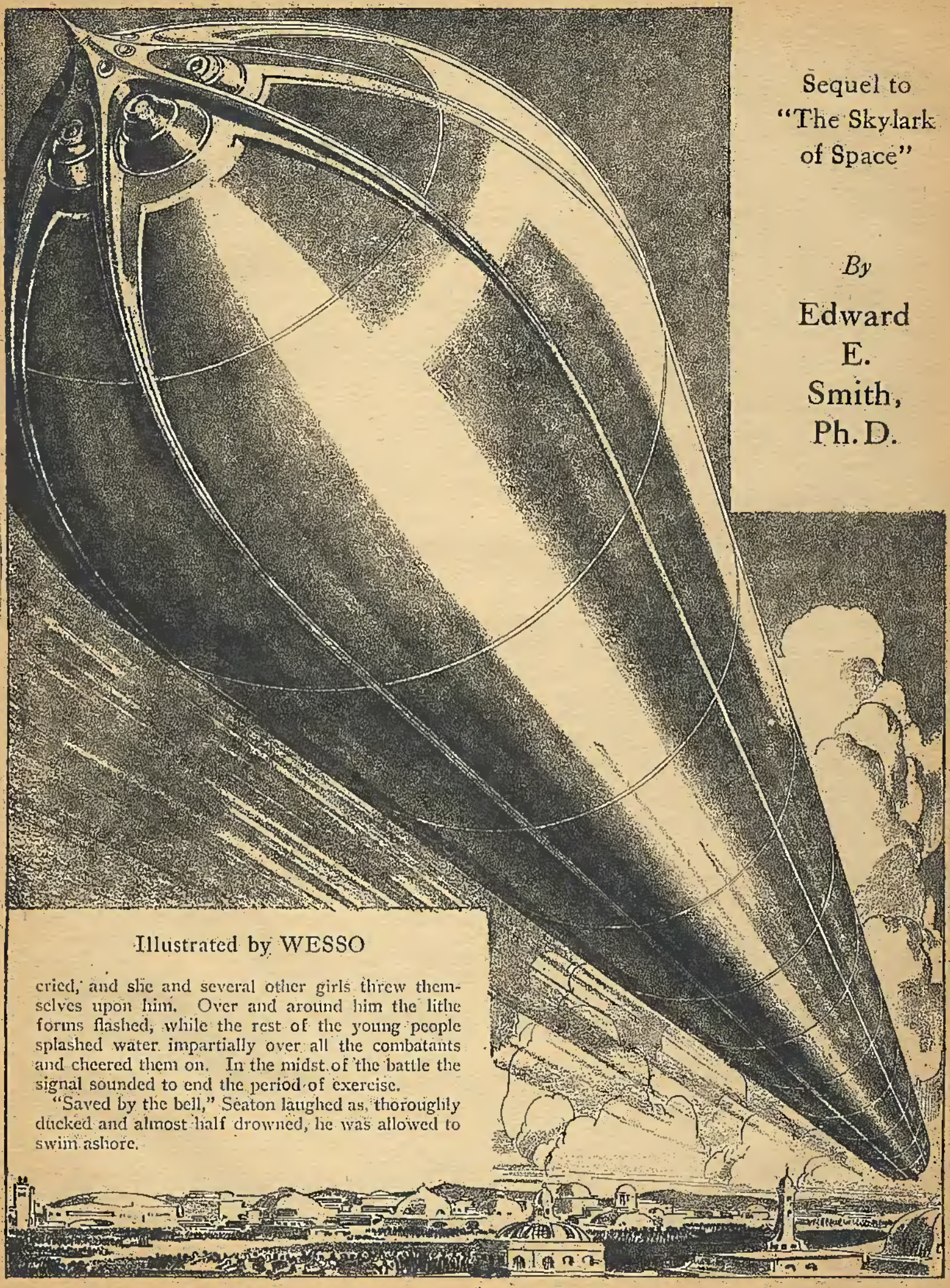
"HOLD tight, everybody!" someone yelled, and interlaced, straining arms and legs held the green and white bodies in one motionless group as a gigantic force hurled them fifty feet into the air and out over the deepest part of the pool. There was a mighty splash and a miniature tidal wave as that mass of humanity struck the water. Many feet they went down before the cordon was broken and the individual units came to the surface. Then pandemonium reigned. Vigorous, informal games, having to do with floating and sinking balls and effigies; pushball, in which the players never seemed to know, or to care, upon which side they were playing; water-fights and ducking contests. . . . A green mermaid, having felt the incredible power of Seaton's arms as he tossed her lightly away from a goal he was temporarily defending, put both her small hands around his biceps wonderingly, amazed at a strength unknown and impossible upon her world; then playfully tried to push him under. Failing, she called for help.

"He's needed a good ducking for ages!" Dorothy

Sequel to "The Skylark of Space"

By

Edward E. Smith, Ph.D.



Illustrated by WESSO

cried, and she and several other girls threw themselves upon him. Over and around him the lithe forms flashed, while the rest of the young people splashed water impartially over all the combatants and cheered them on. In the midst of the battle the signal sounded to end the period of exercise.

"Saved by the bell," Seaton laughed as, thoroughly ducked and almost half drowned, he was allowed to swim ashore.

¶ *Very slowly at first, the unimaginable mass of the vessel floated lightly upward.*

When all had returned to the common room of the observatory and had seated themselves, Orlon took out his miniature ray-projector, no larger than a fountain pen, and flashed it briefly upon one of the hundreds of button-like lenses upon the wall. Instantly each chair converted itself into a form-fitting divan, inviting complete repose.

"I believe that you of Earth would perhaps enjoy some of our music during this, the period of relaxation and repose—it is so different from your own," Orlon remarked, as he again manipulated his tiny force-tube.

EVERY light was extinguished and there was felt a profoundly deep vibration—a note so low as to be palpable rather than audible: and simultaneously the utter darkness was relieved by a tinge of red so dark as to be barely perceptible, while a peculiar somber fragrance pervaded the atmosphere. The music rapidly ran the gamut to the limit of audibility and, in the same tempo, the lights traversed the visible spectrum and disappeared. Then came a crashing chord and a vivid flare of blended light; ushering in an indescribable symphony of sound and color, accompanied by a slower succession of shifting, blending odors.

The quality of tone was now that of a gigantic orchestra, now that of a full brass band, now that of a single unknown instrument—as though the composer had had at his command every overtone capable of being produced by any possible instrument, and with them had woven a veritable tapestry of melody upon an incredibly complex loom of sound. As went the harmony, so the play of light accompanied it. Neither music nor illumination came from any apparent source; they simply pervaded the entire room. When the music was fast—and certain passages were of a rapidity impossible for any human fingers to attain—the lights flashed in vivid, tiny pencils, intersecting each other in sharply drawn, brilliant figures, which changed with dizzying speed: when the tempo was slow, the beams were soft and broad, blending into each other to form sinuous, indefinite, writhing patterns, whose very vagueness was infinitely soothing.

"What do you think of it, Mrs. Seaton?" Orlon asked.

"Marvelous!" breathed Dorothy, awed. "I never imagined anything like it. I can't begin to tell you how much I like it. I never dreamed of such absolute perfection of execution, and the way the lighting accompanies the theme is just too perfectly wonderful for words! It was incredibly brilliant."

"Brilliant—yes. Perfectly executed—yes. But I notice that you say nothing of depth of feeling or of emotional appeal." Dorothy blushed uncomfortably and started to say something, but Orlon silenced her and continued: "You need not apologize. I had a reason for speaking as I did, for in you I recognize a real musician, and our music is indeed entirely soulless. That is the result of our ancient civilization. We are so old that our music is purely intellectual, entirely mechanical, instead of emotional. It is perfect, but, like most of our other arts, it is almost completely without feeling."

"But your statues are wonderful!"

"As I told you, those statues were made myriads of years ago. At that time we also had real music, but, unlike statuary, music at that time could not be preserved for posterity. That is another thing you have given us. Attend!"

At one end of the room, as upon a three-dimensional screen, the four Terrestrials saw themselves seated in the control-room of the *Skylark*. They saw and heard Margaret take up her guitar and strike four sonorous chords in "A." Then, as if they had been there in person, they heard themselves sing "The Bull-Frog" and all the other songs they had sung, far off in space. They heard Margaret suggest that Dorothy play some "real music," and heard Seaton's comments upon the quartette.

"In that, youngster, you were entirely wrong," said Orlon, stopping the reproduction for a moment. "The entire planet was listening to you very attentively—we were enjoying it as no music has been enjoyed for thousands of years."

"The whole planet!" gasped Margaret. "Were you broadcasting it? How could you?"

"Easy," grinned Seaton. "They can do most anything with these rays of theirs."

"When you have time, in some period of labor, we would appreciate it very much if you four would sing for us again, would give us more of your vast store of youthful music, for we can now preserve it exactly as it is sung. But much as we enjoyed the quartette, Mrs. Seaton, it was your work upon the violin that took us by storm. Beginning with tomorrow, my companion intends to have you spend as many periods as you will, playing for our records. We shall now have your music."

"If you like it so well, wouldn't you rather I'd play you something I hadn't played before?"

"That is labor. We could not . . ."

"Piffle!" Dorothy interrupted. "Don't you see that I could really play right now, with somebody to listen, who really enjoys music; whereas, if I tried to play in front of a record, I'd be perfectly mechanical?

"'At-a-girl, Dot! I'll get your fiddle."

"Keep your seat, son," instructed Orlon, as the case containing the Stradivarius appeared before Dorothy, borne by a pencil of force. "While that temperament is incomprehensible to every one of us, it is undoubtedly true that the artistic mind does work in that manner. We listen."

Dorothy swept into "The Melody in F," and as the poignantly beautiful strains poured forth from that wonderful violin, she knew that she had her audience with her. Though so intellectual that they themselves were incapable of producing music of real depth of feeling, they could understand and could enjoy such music with an appreciation impossible to a people of lesser mental attainments; and their profound enjoyment of her playing, burned into her mind by the telepathic, almost hypnotic power of the Norlaminian mentality, raised her to heights of power she had never before attained. Playing as one inspired, she went through one tremendous solo after another—holding her listeners spellbound, urged on by their intense feeling to carry them further and ever further into the realm of pure emotional harmony. The bell which ordinarily signaled the end of the period of relaxation did not sound; for the first time in thousands of years the planet of Norlamin deserted its rigid schedule of life—to listen to one Earth-woman, pouring out her very soul upon her incomparable violin.

The final note of "Memories" died away in a diminuendo wail, and the musician almost collapsed into Seaton's arms. The profound silence, more impressive far than any possible applause, was soon broken by Dorothy.

"There—I'm all right now, Dick. I was about out

of control for a minute. I wish they could have had that on a recorder—I'll never be able to play like that again if I live to be a thousand years old."

"It is on record, daughter. Every note and every inflection is preserved, precisely as you played it," Orlon assured her. "That is our only excuse for allowing you to continue as you did, almost to the point of exhaustion. While we cannot really understand an artistic mind of the peculiar type to which yours belongs, yet we realized that each time you play you are doing something that no one, not even yourself, can ever do again in precisely the same subtle fashion. Therefore we allowed, in fact encouraged, you to go on as long as that creative impulse should endure—not merely for our pleasure in hearing it, great though that pleasure was, but in the hope that our workers in music could, by a careful analysis of your product, determine quantitatively the exact vibrations or overtones which make the difference between emotional and intellectual music."

CHAPTER XI

Into a Sun

As Rovol and Seaton approached the physics laboratory at the beginning of the period of labor, another small airboat occupied by one man drew up beside them and followed them to the ground. The stranger, another white-bearded ancient, greeted Rovol cordially and was introduced to Seaton as "Caslor, the First of Mechanism."

"Truly, this is a high point in the course of Norlaminian science, my young friend," Caslor acknowledged the introduction smilingly. "You have enabled us to put into practice many things which our ancestors studied in theory for many a wearisome cycle of time." Turning to Rovol, he went on: "I understand that you require a particularly precise directional mechanism? I know well that it must indeed be one of exceeding precision and delicacy, for the controls you yourself have built are able to hold upon any point, however moving, within the limits of our immediate solar system."

"We require controls a million times as delicate as any I have constructed," said Seaton, "therefore I have called your surpassing skill into co-operation. It is senseless for me to attempt a task in which I would be doomed to failure. We intend to send out a fifth-order projection, something none of our ancestors ever even dreamed of, which, with its inconceivable velocity of propagation, will enable us to explore any region in the galaxy as quickly as we now visit our closest sister planet. Knowing the dimensions of this, our galaxy, you can readily understand the exact degree of precision required to hold upon a point at its outermost edge."

"Truly, a problem worthy of any man's brain," Caslor replied after a moment's thought. "Those small circles," pointing to the forty-foot hour and declination circles which Seaton had thought the ultimate in precise measurement of angular magnitudes, "are of course useless. I shall have to construct large and accurate circles, and in order to produce the slow and fast motions of the required nature, without creep, slip, play, or backlash, I shall require a pure torque, capable of being increased by infinitesimal increments. . . . Pure torque."

He thought deeply for a time, then went on: "No gear-strain or chain mechanism can be built of sufficient tightness, since in any mechanism there is some freedom of motion, however slight, and for this purpose the director must have no freedom of motion whatever. We must have a pure torque—and the only possible force answering our requirements is the four hundred sixty-seventh band of the fourth order. I shall therefore be compelled to develop that band. The director must, of course, have a full equatorial mounting, with circles some two hundred and fifty feet in diameter. Must your projector tube be longer than that, for correct design?"

"That length will be ample."

"The mounting must be capable of rotation through the full circle of arc in either plane, and must be driven in precisely the motion required to neutralize the motion of our planet, which, as you know, is somewhat irregular. Additional fast and slow motions must, of course, be provided to rotate the mechanism upon each graduated circle at the will of the operator. It is my idea to make the outer supporting tube quite large, so that you will have full freedom with your inner, or projector tube proper. It seems to me that dimensions X37 B42 J867 would perhaps be as good as any."

"Perfectly satisfactory. You have the apparatus well in mind."

"These things will consume some time. How soon will you require this mechanism?" asked Caslor.

"We also have much to do. Two periods of labor, let us say; or, if you require them, three."

"It is well. Two periods will be ample time: I was afraid that you might need it today, and the work cannot be accomplished in one period of labor. The mounting will, of course, be prepared in the Area of Experiment. Farewell."

"You aren't going to build the final projector here, then?" Seaton asked as Caslor's flier disappeared.

"We shall build it here, then transport it to the Area, where its dirigible housing will be ready to receive it. All mechanisms of that type are set up there. Not only is the location convenient to all interested, but there are to be found all necessary tools, equipment and material. Also, and not least important for such long-range work as we contemplate, the entire Area of Experiment is anchored immovably to the solid crust of the planet, so that there can be not even the slightest vibration to affect the direction of our beams of force, which must, of course, be very long."

He closed the master switches of his power-plants and the two resumed work where they had left off. The control panel was soon finished. Rovol then plated an immense cylinder of copper and placed it in the power-plant. He next set up an entirely new system of refractory relief-points and installed additional ground-rods, sealed through the floor and extending deep into the ground below, explaining as he worked.

"You see, son, we must lose one one-thousandth of one per cent of our total energy, and provision must be made for its dissipation in order to avoid destruction of the laboratory. These air-gap resistances are the simplest means of disposing of the wasted power."

"I get you—but say, how about disposing of it when we get the thing in a ship out in space? We picked up pretty heavy charges in the *Skylark*—so heavy that I had to hold up several times in the ionized layer of an atmosphere while they faded—and this outfit will burn up tons of copper where the old ones used ounces."

"In the projected space-vessel we shall install converters to utilize all the energy, so that there will be no loss whatever. Since such converters must be designed and built especially for each installation, and since they require a high degree of precision, it is not worth while to construct them for a purely temporary mechanism, such as this one."

THE walls of the laboratory were opened, ventilating blowers were built, and refrigerating coils were set up everywhere, even in the tubular structure and behind the visiplates. After assuring themselves that everything combustible had been removed, the two scientists put on under their helmets, goggles whose protecting lenses could be built up to any desired thickness. Rovol then threw a switch, and a hemisphere of flaming golden radiance surrounded the laboratory and extended for miles upon all sides.

"I get most of the stuff you've pulled so far, but why such a light?" asked Seaton.

"As a warning. This entire area will be filled with dangerous frequencies, and that light is a warning for all uninsulated persons to give our theater of operations a wide berth."

"I see. What next?"

"All that remains to be done is to take our lens-material and go," replied Rovol, as he took from a cupboard the largest faidon that Seaton had ever seen.

"Oh, that's what you're going to use! You know, I've been wondering about that stuff. I took one back with me to the Earth to experiment on. I gave it everything I could think of and couldn't touch it. I couldn't even make it change its temperature. What is it, anyway?"

"It is not matter at all, in the ordinary sense of the word. It is almost pure crystallized energy. You have, of course, noticed that it looks transparent, but that it is not. You cannot see into its substance a millionth of a micron—the illusion of transparency being purely a surface phenomenon, and peculiar to this one form of substance. I have told you that the ether is a fourth-order substance—this also is a fourth-order substance, but it is crystalline, whereas the ether is probably fluid and amorphous. You might call this faidon crystallized ether without being far wrong."

"But it should weigh tons, and it is hardly heavier than air—or no, wait a minute. Gravitation is also a fourth-order phenomenon, so it might not weigh anything at all—but it would have terrific mass—or would it, not having protons? Crystallized ether would displace fluid ether, so it might—I'll give up! It's too deep for me!" said Seaton.

"Its theory is abstruse, and I cannot explain it to you any more fully than I have, until after we have given you a knowledge of the fourth and fifth orders. Pure fourth-order material would be without weight and without mass; but these crystals as they are found are not absolutely pure. In crystallizing from the magma, they entrapped sufficient numbers of particles of the higher orders to give them the characteristics which you have observed. The impurities, however, are not sufficient in quantity to offer a point of attack to any ordinary reagent."

"But how could such material possibly be formed?"

"It could be formed only in some such gigantic cosmic body as this, our green system, formed incalculable ages ago, when all the mass comprising it existed as one colossal sun. Picture for yourself the condition in the center of that sun. It has attained the theoretical maximum of temperature — some seventy million of your centigrade degrees—the electrons have been stripped from the protons until the entire central core is one solid ball of neutronium and can be compressed no more without destruction of the protons themselves. Still the pressure increases. The temperature, already at the theoretical maximum, can no longer increase. What happens?"

"Disruption."

"Precisely. And just at the instant of disruption, during the very instant of generation of the frightful forces that are to hurl suns, planets and satellites millions of miles out into space—in that instant of time, as a result of those unimaginable temperatures and pressures, the faidon comes into being. It can be formed only by the absolute maximum of temperature and at a pressure which can exist only momentarily, even in the largest conceivable masses."

"Then how can you make a lens of it? It must be impossible to work it in any way."

"It cannot be worked in any ordinary way, but we shall take this crystal into the depths of that white dwarf star, into a region in which obtain pressures and temperatures only less than those giving it birth. There we shall play forces upon it which, under those conditions, will be able to work it quite readily."

"Hm—m—m. I want to see that! Let's go!"

They seated themselves at the panels, and Rovol began to manipulate keys, levers and dials. Instantly a complex structure of visible force—rods, beams and flat areas of flaming scarlet energy — appeared at the end of the tubular, telescope-like network.

"Why red?"

"Merely to render them visible. One cannot work well with invisible tools, hence I have imposed a colored light frequency upon the invisible frequencies of the forces. We will have an assortment of colors if you prefer," and as he spoke each ray assumed a different color, so that the end of the projector was almost lost beneath a riot of color.

The structure of force, which Seaton knew was the secondary projector, swung around as if sentient, and a lurid green ray extended itself, picked up the faidon, and lengthened out, hurling the jewel a thousand yards out through the open side of the laboratory. Rovol moved more controls and the structure again righted itself, swinging back into perfect alignment with the tube and carrying the faidon upon its extremity, a thousand yards beyond the roof of the laboratory.

"We are now ready to start our projections. Be sure your suit and goggles are perfectly tight. We must see what we are doing, so the light-rays must be heterodyned upon our carrier wave. Therefore the laboratory and all its neighborhood will be flooded with dangerous frequencies from the sun we are to visit, as well as with those from our own generators."

"O. K., chief! All tight here. You say it's ten light-years to that star. How long's it going to take us to get there?"

"About ten minutes. We could travel that far in less than ten seconds but for the fact that we must take the faidon with us. Slight as is its mass, it will require much energy in its acceleration. Our projections, of

course, have no mass, and will require only the energy of propagation."

Rovol flicked a finger, a massive pair of plunger switches shot into their sockets, and Seaton, seated at his board and staring into his visiplate, was astounded to find that he apparently possessed a dual personality. He *knew* that he was seated motionless in the operator's chair in the base of the rigidly anchored primary projector, and by taking his eyes away from the visiplate before him, he could see that nothing in the laboratory had changed, except that the pyrotechnic display from the power-bar was of unusual intensity. Yet, looking into the visiplate, he was out in space *in person*, hurtling through space at a pace beside which the best effort of the *Skylark* seemed the veriest crawl. Swinging his controls to look backward, he gasped as he saw, so stupendous was their velocity, that the green system was only barely discernible as a faint green star!

AGAIN looking forward, it seemed as though a fierce white star had separated from the immovable firmament and was now so close to the structure of force in which he was riding that it was already showing a disk perceptible to the unaided eye. A few moments more and the violet-white splendor became so intense that the watchers began to build up, layer by layer, the protective goggles before their eyes. As they approached still closer, falling with their unthinkable velocity into that incandescent inferno, a sight was revealed to their eyes such as man had never before been privileged to gaze upon. They were falling into a white dwarf star, could see everything visible during such an unheard-of journey, and would live to remember what they had seen! They saw the magnificent spectacle of solar prominences shooting hundreds of thousands of miles into space, and directly in their path they saw an immense sunspot, a combined volcanic eruption and cyclonic storm in a gaseous-liquid medium of blinding incandescence.

"Better dodge that spot, hadn't we, ace? Mightn't it be generating interfering fourth-order frequencies?" cried Seaton.

"It is undoubtedly generating fourth-order rays, but nothing can interfere with us, since we are controlling every component of our beam from Norlamin."

Seaton gripped his hand-rail violently and involuntarily drew himself together into the smallest possible compass as, with their awful speed unchecked, they plunged through that flaming, incandescent photosphere and on, straight down, into the unexplored, unimaginable interior of that frightful and searing orb. Through the protecting goggles, now a full four inches of that peculiar, golden, shielding metal, Seaton could see the structure of force in which he was, and could also see the faidon—in outline, as transparent diamonds are visible in equally transparent water. Their apparent motion slowed rapidly and the material about them thickened and became more and more opaque. The faidon drew back toward them until it was actually touching the projector, and eddy currents and striae became visible in the mass about them as their progress grew slower and slower.

"'Smatter? Something gone screwy?" demanded Seaton.

"Not at all, everything is working perfectly. The substance is now so dense that it is becoming opaque to rays of the fourth order, so that we are now partially displacing the medium instead of moving through it without friction. At the point where we can barely see to work; that is, when the fourth-order rays will be so retarded that they can no longer carry the heterodyned light waves without complete distortion, we shall stop automatically, as the material at that depth will have the required density to refract the fifth-order rays to the correct degree."

"How can our foundations stand it?" asked Seaton. "This stuff must be a hundred times as dense as platinum already, and we must be pushing a horrible load in going through it."

"We are exerting no force whatever upon our foundations nor upon Norlamin. The force is transmitted without loss from the power-plant in our laboratory to this secondary projector here inside the star, where it is liberated in the correct band to pull us through the mass, using all the mass ahead of us as anchorage. When we wish to return, we shall simply change the pull into a push. Ah! We are now at a standstill—now comes the most important moment of the entire project!"

All apparent motion had ceased, and Seaton could see only dimly the outlines of the faidon, now directly before his eyes. The structure of force slowly warped around until its front portion held the faidon as in a vise. Rovol pressed a lever and behind them, in the laboratory, four enormous plunger switches drove home. A plane of pure energy, flaming radiantly even in the indescribable incandescence of the core of that seething star, bisected the faidon neatly, and ten gigantic beams, five upon each half of the jewel, rapidly molded two sections of a geometrically-perfect hollow lens. The two sections were then brought together by the closing of the jaws of the mighty vise, their edges in exact alignment. Instantly the plane and the beams of energy became tranformed into two terrific opposing tubes of force—vibrant, glowing tubes, whose edges in contact coincided with the almost invisible seam between the two halves of the lens.

Like a welding arc raised to the *nth* power these two immeasurable and irresistible forces met exactly in opposition—a meeting of such incredible violence that seismic disturbances occurred throughout the entire mass of that dense, violet-white star. Sunspots of unprecedented size appeared, prominences erupted to hundreds of times their normal distances, and although the two scientists deep in the core of the tormented star were unaware of what was happening upon its surface, convulsion after Titanic convulsion wracked the mighty globe, and enormous masses of molten and gaseous material were riven from it and hurled far out into space—masses which would in time become planets of that youthful and turbulent luminary.

Seaton felt his air-supply grow hot. Suddenly it became icy cold, and knowing that Rovol had energized the refrigerator system, Seaton turned away from the fascinating welding operation for a quick look around the laboratory. As he did so, he realized Rovol's vast knowledge and understood the reason for the new system of relief-points and ground-rods, as well as the necessity for the all-embracing scheme of refrigeration.

Even through the practically opaque goggles he could see that the laboratory was one mass of genuine lightning. Not only from the relief-points, but from every

metallic corner and protuberance the pent-up losses from the disintegrating bar were hurling themselves upon the flaring, blue-white, rapidly-volatilizing ground-rods; and the very air of the room, renewed second by second though it was by the powerful blowers, was beginning to take on the pearly luster of the highly-ionized corona. The bar was plainly visible, a scintillating demon of pure violet radiance, and a momentary spasm of fear seized him as he saw how rapidly that great mass of copper was shrinking—fear that their power would be exhausted with their task still uncompleted.

But the calculations of the aged physicist had been accurate. The lens was completed with some hundreds of pounds of copper to spare, and that geometrical form, with its precious content of semi-neutronium, was following the secondary projector back toward the green system. Rovol left his seat, discarded his armor, and signaled Seaton to do the same

"I've got to hand it to you, ace—you sure are a blinding flash and a deafening report!" Seaton exclaimed, writhing out of his insulating suit. "I feel as though I'd been pulled half-way through a knot-hole and riveted over on both ends! How big a lens did you make, anyway? Looked as though it would hold a couple of liters; maybe three."

"Its contents are almost exactly three liters."

"Hm—m—m. Seven and a half million kilograms—say eight thousand tons. *Some* mass, I'd say, to put into a gallon jug. Of course, being inside the faidon, it won't have any weight, but it'll have all its full quota of inertia. That's why you're taking so long to bring it in, of course."

"Yes. The projector will now bring it here into the laboratory without any further attention from us. The period of labor is about to end, and tomorrow we shall find the lens awaiting us when we arrive to begin work."

"How about cooling it off? It had a temperature of something like forty million degrees centigrade before you started working on it; and when you got done with it, it was hot."

"You are forgetting again, son. Remember that the hot, dense material is entirely enclosed in an envelope impervious to all vibrations longer than those of the fifth order. You could put your hand upon it now, without receiving any sensation either of heat or of cold."

"Yeah, that's right, too. I noticed that I could take a faidon right out of an electric arc and it wouldn't even be warm. I couldn't explain why it was, but I see now. So that stuff inside that lens will always stay as hot as it is right now! Zowie! Here's hoping she never explodes! Well, there's the bell—for once in my life, I'm all ready to quit when the whistle blows," and arm in arm the young Terrestrial chemist and the aged Norlaminian physicist strolled out to their waiting airboat.

CHAPTER XII

Flying Visits—Via Projection

"WELL, what to do?" asked Seaton as he and Rovol entered the laboratory. "Tear down this fourth-order projector and tackle the big job? I see the lens is here, on schedule, so we can hop right into it."

"We shall have further use for this mechanism. We shall need at least one more lens of this dense material, and other scientists also may have need of one or two. Then, too, the new projector must be so large that it cannot be erected in this room."

As he spoke, Rovol seated himself at his control-desk and ran his fingers lightly over the keys. The entire wall of the laboratory disappeared, hundreds of beams of force darted here and there, seizing and working raw materials, and in the portal there grew up, to Seaton's amazement, a keyboard and panel installation such as the Earth-man, in his wildest moments, had never imagined. Bank upon bank of typewriter-like keys; row upon row of keys, pedals, and stops resembling somewhat those of the console of a gigantic pipe-organ; panel upon panel of meters, switches, and dials—all arranged about two deeply-cushioned chairs and within reach of their occupants.

"Whew! That looks like the combined mince-pie nightmares of a whole flock of linotype operators, pipe-organists, and hard-boiled radio hams!" exclaimed Seaton when the installation was complete. "Now that you've got it, what are you going to do with it?"

"There is not a control system in Norlamin adequate for the task we face, since the problem of the projection of rays of the fifth order has heretofore been of only academic interest. Therefore it becomes necessary to construct such a control. This mechanism will, I am confident, have a sufficiently wide range of application to perform any operation we shall require of it."

"It sure looks as though it could do almost anything, provided the man behind it knows how to play a tune on it—but if that rumble seat is for me, you'd better count me out right now. I followed you for about fifteen seconds, then lost you completely; and now I'm sunk without a trace," said Seaton.

"That is, of course, true, and is a point I was careless enough to overlook." Rovol thought for a moment, then got up, crossed the room to his control desk, and continued, "We shall dismantle the machine and rebuild it at once."

"Oh no—too much work!" protested Seaton. "You've got it about done, haven't you?"

"It is hardly started. Two hundred thousand bands of force must be linked to it, each in its proper place, and it is necessary that you should understand thoroughly every detail of this entire projector." Rovol answered.

"Why? I'm not ashamed to admit that I haven't got brains enough to understand a thing like that."

"You have sufficient brain capacity; it is merely undeveloped. There are two reasons why you must be as familiar with the operation of this mechanism as you are with the operation of one of your Earthly automobiles. The first is that a similar control is to be installed in your new space-vessel, since by its use you can attain a perfection of handling impossible by any other system. The second, and more important reason, is that neither I nor any other man of Norlamin could compel himself, by any force of will, to direct a ray that would take away the life of any fellow-man."

While Rovol was speaking, he reversed his rays, and soon the component parts of the new control had been disassembled and piled in orderly array about the room.

"Hm—m—m. Never thought of that. It's right too," mused Seaton. "How're you going to get it into my thick skull—with an educator?"

"Exactly," and Rovol sent a beam of force after his

Looking into the visiplate, he was out in space in person, hurtling through space at a pace, beside which the best effort of the Skylark seemed the veriest crawl.

highly developed educational mechanism. Dials and electrodes were adjusted, connections were established, and the beams and pencils of force began to reconstruct the great central controlling device. But this time, instead of being merely a bewildered spectator, Seaton was an active participant in the work. As each key and meter was wrought and mounted, there were indelibly impressed upon his brain the exact reason for and function of the part, and later, when the control itself was finished and the seemingly interminable task of connecting it up to the output force-bands of the transformers had begun, he had a complete understanding of everything with which he was working, and understood all the means by which the ends he had so long desired were to be attained. For to the ancient scientist the tasks he was then performing were the merest routine, to be performed in reflex fashion, and he devoted most of his attention to transferring from his own brain to that of his young assistant as much of his stupendous knowledge as the smaller brain of the Terrestrial was capable of absorbing. More and more rapidly as the work progressed the mighty flood of knowledge poured into Seaton's mind. After an hour or so, when enough connections had been made so that automatic forces could be so directed as to finish the job, Rovol and Seaton left the laboratory and went into the living room. As they walked, the educator accompanied them, borne upon its beam of force.

"Your brain is behaving very nicely indeed," said Rovol, "much better than I would have thought possible from its size. In fact, it may be possible for me to transfer to you all the knowledge I have which might be of use to you. That is why I took you away from the laboratory. What do you think of the idea?"

"Our psychologists have always maintained that none of us ever uses more than a minute fraction of the actual capacity of his brain," Seaton replied after a moment's thought. "If you think you can give me even a percentage of your knowledge without killing me, go to it—I'm for it, strong!"

"Knowing that you would be, I have already requested Drasnik, the First of Psychology, to come here, and he has just arrived," answered Rovol. And as he spoke, that personage entered the room.

When the facts had been set before him, the psychologist nodded his head

"That is quite possible," he said with enthusiasm, "and I will be only too glad to assist in such an operation."

"But listen!" protested Seaton, "You'll probably change my whole personality! Rovol's brain is three times the size of mine."

"Tut-tut—nothing of the kind," Drasnik reproved him. "As you have said, you are using only a minute portion of the active mass of your brain. The same thing is true with us—many millions of cycles would have to pass before we would be able to fill the brains we now have."

"Then why are your brains so large?"

"Merely a provision of Nature that no possible accession of knowledge shall find her storehouse too small," replied Drasnik, positively. "Ready?"

All three donned the headsets and a wave of mental force swept into Seaton's mind, a wave of such power that the Terrestrial's every sense wilted under the impact. He did not faint, he did not lose consciousness—he simply lost all control of every nerve and fiber as his entire brain passed into the control of the immense mentality of the First of Psychology and became a purely receptive, plastic medium upon which to impress the knowledge of the aged physicist.

HOUR after hour the transfer continued, Seaton lying limp as though lifeless, the two Norlaminians tense and rigid, every faculty concentrated upon the ignorant, virgin brain exposed to their gaze. Finally the operation was complete and Seaton, released from the weird, hypnotic grip of that stupendous mind, gasped, shook himself, and writhed to his feet.

"Great Cat!" he exclaimed, his eyes wide with astonishment. "I wouldn't have believed there was as much to know in the entire Universe as I know right now, and I know it as well as I ever knew elementary algebra. Thanks, fellows, a million times—but say, did you leave any open spaces for more? In one way, I seem to know less than I did before, there's so much more to find out. Can I learn anything more, or did you fill me up to capacity?"

The psychologist, who had been listening to the exuberant youth with undisguised pleasure, spoke calmly.

"The mere fact that you appreciate your comparative ignorance shows that you are still capable of learning. Your capacity to learn is greater than it ever was before, even though the waste space has been reduced. Much to our surprise, Rovol and I gave you all of his knowledge that would be of any use to you, and some of my own, and still theoretically you can add to it more than nine times the total of your present knowledge."

The psychologist departed, and Rovol and Seaton returned to the laboratory, where the forces were still merrily at work. There was nothing that could be done to hasten the connecting, and it was late in the following period of labor before they could begin the actual construction of the projector. Once started, however, it progressed with amazing rapidity. Now understanding the system, it did not seem strange to Seaton that he should merely actuate a certain combination of forces when he desired a certain operation performed; nor did it seem unusual or worthy of comment that one flick of his finger over that switchboard would send a force a distance of hundreds of miles to a factory where other forces were busily at work, to seize a hundred angle-bars of transparent purple metal that were to form the backbone of the fifth-order projector. Nor did it seem peculiar that the same force, with no further instruction, should bring these hundred bars back to him, in a high loop through the atmosphere; should deposit them gently in a convenient space near the site of operations; and then should disappear as though it had never existed! With such tools as that, it was a matter of only a few hours before the projector was done—a task that would have required years of planning and building upon Earth.

Two hundred and fifty feet it towered above their heads, a tubular network of braced and latticed bars of purple metal, fifty feet in diameter at the base and tapering smoothly to a diameter of about ten feet at the top. Built of a metal thousands of times as strong and hard as steel, it was not cumbersome in appearance, and yet was strong enough to be absolutely rigid. Ten enormous supporting forces held the lens of neutronium immovable in the exact center of the upper end; at intervals down the shaft similar forces held variously-shaped

lenses and prisms formed from zones of force; in the center of the bottom or floor of the towering structure was the double controlling system, with a universal visiplate facing each operator.

"Well, Rovol, that's that," remarked Seaton as the last connection was made. "What say we hop in and give the baby a ride over to the Area of Experiment? Caslor must have the mounting done, and we've got time enough left in this period to try her out."

"In a moment. I am setting the fourth-order projector to go out to the dwarf star after an additional supply of neutronium."

Seaton, knowing from the data of their first journey, that the controls could be so set as to duplicate their feat in every particular without supervision, stepped into his seat in the new controller, pressed a key, and spoke.

"Hi, Dottie, what's on your mind?"

"Nothing much," Dorothy's clear voice answered. "Got it done and can I see it?"

"Sure—sit tight and I'll send a boat after you."

As he spoke, Rovol's flier darted into the air and away; and in two minutes it returned, slowing abruptly as it landed. Dorothy stepped out, radiant, and returned Seaton's enthusiastic caresses with equal fervor before she spoke.

"Lover, I'm afraid you violated all known speed laws getting me over here. Aren't you afraid of getting pinched?"

"Nope—not here. Besides, I didn't want to keep Rovol waiting—we're all ready to go. Hop in here with me, this left-hand control's mine."

Rovol entered the tube, took his place, and waved his hand. Seaton's hands swept over the keys and the whole gigantic structure wafted into the air. Still upright, it was borne upon immense rods of force toward the Area of Experiment, which was soon reached. Covered as the Area was with fantastic equipment, there was no doubt as to their destination, for in plain sight, dominating all the lesser instruments, there rose a stupendous telescopic mounting, with an enormous hollow tube of metallic lattice-work which could be intended for nothing else than their projector. Approaching it carefully, Seaton deftly guided the projector lengthwise into that hollow receptacle and anchored it in the exact optical axis. Flashing beams of force made short work of welding the two tubes together immovably with angles and lattices of the same purple metal, the terminals of the variable-speed motors were attached to the controllers, and everything was in readiness for the first trial.

"What special instructions do we need to run it, if any?" Seaton asked of the First of Mechanism, who had lifted himself up into the projector.

"Very little. This motor governs the hour motion, that one the right ascension. The potentiometers regulate the degree of vernier action—any ratio is possible, from direct drive up to more than a hundred million complete revolutions of that graduated dial to give you one second of arc."

"Plenty fine, I'd say. Thanks a lot, ace. Whither away, Rovol—any choice?"

"Anywhere you please, son, since this is merely a try-out."

"O. K. We'll hop over and tell Dunark hello."

The tube swung around into line with that distant planet and Seaton stepped down hard, upon a pedal. Instantly they seemed infinite myriads of miles out in space, the green system barely visible as a faint green star behind them.

"Wow, that ray's fast!" exclaimed the pilot, ruefully. "I overshot about a thousand light years. We'll try again, with considerably less power," and he rearranged and reset the dials and meters before him. Adjustment after adjustment and many reductions in power had to be made before the projection ceased leaping millions of miles at a touch, but finally the operators became familiar with the new technique and the ray became manageable. Soon they were hovering above what had been Mardonal, and saw that all signs of warfare had disappeared. Slowly turning the controls, Seaton flashed the projection over the girdling Osnomian sea and guided it through the impregnable metal walls of the palace into the throne room of Roban, where they saw the Emperor, Tarnan the Karbix, and Dunark in close conference.

"Well, here we are," remarked Seaton. "Now we'll put on a little visibility and give the natives a treat."

"Sh-sh," whispered Dorothy, "they'll hear you, Dick—we're intruding shamefully."

"No, they won't hear us, because I haven't heterodyned the audio in on the wave yet. And as for intruding, that's exactly what we came over here for."

HE imposed the audio system upon the inconceivably high frequency of their carrier wave and spoke in the Osnomian tongue.

"Greetings, Roban, Dunark, and Tarnan, from Seaton." All three jumped to their feet, amazed, staring about the empty room as Seaton went on, "I am not here in person. I am simply sending you my projection. Just a moment and I will put on a little visibility."

He brought more forces into play, and solid images of force appeared in the great hall; images of the three occupants of the controller. Introductions and greetings over, Seaton spoke briefly and to the point.

"We've got everything we came after—much more than I had any idea we could get. You need have no more fear of the Fenachrone—we have found a science superior to theirs. But much remains to be done, and we have none too much time; therefore I have come to you with certain requests."

"The Overlord has but to command," replied Roban.

"Not command, since we are all working together for a common cause. In the name of that cause, Dunark, I ask you to come to me at once, accompanied by Tarnan and any others you may select. You will be piloted by a ray which we shall set upon your controls. Upon your way here you will visit the First City of Dasor, another planet, where you will pick up Saener Carfon, who will be awaiting you there."

"As you direct, so it shall be," and Seaton flashed the projector to the neighboring planet of Urvania. There he found that the gigantic space-cruiser he had ordered had been completed, and requested Urvan and his commander-in-chief to tow it to Norlamin, piloted by a ray. He then jumped to Dasor, there interviewing Carfon and being assured of the full co-operation of the porpoise-men.

"Well, that's that, folks," said Seaton as he shut off the power. "We can't do much more for a few days, until the gang gets here for the council of war. How'd it be, Rovol, for me to practice with this outfit while

you are finishing up the odds and ends you want to clean up? You might suggest to Orlon, too, that it'd be a good deed for him to pilot those folks over here."

As Rovol wafted himself to the ground from their lofty station, Crane and Margaret appeared and were lifted up to the place formerly occupied by the physicist.

"How's tricks, Mart? I hear you're quite an astronomer?" said Seaton.

"Yes, thanks to Orlon and the First of Psychology. He seemed quite interested in increasing our Earthly knowledge. I certainly know much more than I had ever hoped to know of anything."

"Yeah, you can pilot us to the Fenachrone system now without any trouble. You also absorbed some ethnology and kindred sciences. What d'you think—with Dunark and Urvan, do we know enough to go ahead or should we take a chance on holding things up while we get acquainted with some of the other peoples of these planets of the green system?"

"Delay is dangerous, as our time is already short," Crane replied after a time. "We know enough, I believe; and furthermore, any additional assistance is problematical; in fact, it is more than doubtful. The Norlaminians have surveyed the system rather thoroughly, and no other planet seems to have inhabitants who have even approached the development attained here."

"Right—that's the way I dope it, exactly. We'll wait until the gang assembles, then go over the top. In the meantime, I called you over to take a ride in this projector—it's a darb. I'd like to shoot for the Fenachrone system first, but I don't quite dare to."

"Don't *dare* to? You?" scoffed Margaret. "How come?"

"Cancel the 'dare'—change it to 'prefer not to.' Why? Because while they can't work through a zone of force, some of their real scientists—and they have lots of them, not like the bull-headed soldier we captured—may well be able to detect a fifth-order ray—even if they can't work with them intelligently—and if they detected our ray, it'd put them on guard."

"You are exactly right, Dick," agreed Crane. "And there speaks the Norlaminian physicist, and not my old and reckless playmate Richard Seaton."

"Oh, I don't know—I told you I was getting timid as a mouse. But let's not sit here twiddling our thumbs—let's go places and do things. Whither away? I want a destination a good ways off, not something in our own back yard."

"Go back home, of course, stupe," put in Dorothy, "do you have to be told every little thing?"

"Sure—never thought of that," and Seaton, after a moment's rapid mental arithmetic, swung the great tube around, rapidly adjusted a few dials, and stepped down upon a pedal. There was a fleeting instant of unthinkable velocity; then they found themselves poised somewhere in space.

"Well, wonder how far I missed it on my first shot?" Seaton's crisp voice broke the stunned silence. "Guess that's our sun, over to the left, ain't it, Mart?"

"Yes. You were about right for distance, and within a few tenths of a light-year laterally. That is fairly close, I should have said."

"Rotten, for these controls. Except for the effect of relative proper motions, which I can't calculate yet for lack of data. I should be able to hit a gnat right in the left eye at this range—and the difference in proper motions couldn't have thrown me off more than a few hundred feet. Nope, I was too anxious—hurried too much on the settings of the slow verniers. I'll snap back and try it again."

He adjusted the verniers very carefully, and again threw on the power. Again there was the sensation of the barest perceptible moment of unimaginable speed, and they were in the air some fifty feet above the ground of Crane Field, almost above the testing shed. Seaton rapidly adjusted the variable-speed motors until they were perfectly stationary, relative to the surface of the earth.

"You are improving," commended Crane.

"Yeah—that's more like it. Guess maybe I can learn in time to shoot this gun. Well, let's go down."

They dropped through the roof into the laboratory where Maxwell, now in charge of the place, was watching a reaction and occasionally taking notes.

"Hi, Max! Seaton speaking, on a television. Got your range?"

"Exactly, Chief, apparently. I can hear you perfectly, but can't see anything," Maxwell stared about the empty laboratory.

"You will in a minute. I knew I had you, but didn't want to scare you out of a year's growth," and Seaton thickened the image until they were plainly visible.

"Please call Mr. Vaneman on the phone and tell him you're in touch with us," directed Seaton as soon as greetings had been exchanged. "Better yet, after you've broken it to them gently, Dot can talk to them, then we'll go over and see 'em."

The connection established, Dorothy's image floated up to the telephone and apparently spoke.

"Mother? This is the weirdest thing you ever imagined. We're not really here at all you know—we're actually here in Norlamin—no, I mean Dick's just sending a kind of a talking picture of us to see you on earth here. . . . . Oh, no, I don't know anything about it—it's like a talkie sent by radio, only worse, because I am saying this myself right now, without any rehearsal or anything . . . we didn't want to burst in on you without warning, because you'd be sure to think you were seeing actual ghosts, and we're not dead the least bit . . . we're having the most perfectly gorgeous time you ever imagined. . . . Oh, I'm so excited I can't explain anything, even if I knew anything about it to explain. We'll all four of us be over there in about a second and tell you all about it. 'Bye!"

Indeed, it was even less than a second—Mrs. Vaneman was still in the act of hanging up the receiver when the image materialized in the living room of Dorothy's girlhood home.

"Hello, mother and dad," Seaton's voice was cheerful, but matter-of-fact. "I'll thicken this up so you can see us better in a minute. But don't think that we are flesh and blood. You'll see simply three-dimensional talking pictures of ourselves, transmitted by radio."

For a long time Mr. and Mrs. Vaneman chatted with the four visitors from so far away in space, while Seaton gloried in the working of that marvelous projector.

"Well, our time's about up," Seaton finally ended the visit. "The quitting-whistle's going to blow in five minutes, and they don't like overtime work here where we are. We'll drop in and see you again maybe, some time before we come back."

"Do you know yet when you are coming back?" asked Mrs. Vaneman.

"Not an idea in the world, mother, any more than we had when we started. But we're getting along fine, having the time of our lives, and are learning a lot besides. So-long!" and Seaton clicked off the power.

AS they descended from the projector and walked toward the waiting airboat, Seaton fell in beside Rovol.

"You know they've got our new cruiser built of dagal, and are bringing it over here. Dagal's good stuff, but it isn't as good as your purple metal, inoson, which is the theoretical ultimate in strength possible for any material possessing molecular structure. Why wouldn't it be a sound idea to flash it into inoson when it gets here?"

"That would be an excellent idea, and we shall do so. It also has occurred to me that Caslor of Mechanism, Astron of Energy, Satrazon of Chemistry, myself, and one of two others, should collaborate in installing a very complete fifth-order projector in the new *Skylark*, as well as any other equipment which may seem desirable. The security of the Universe may depend upon the abilities and qualities of you Terrestrials and your vessel, and therefore nothing should be left undone which it is possible for us to do."

"You chirped something then, old scout—thanks. You might do that, while I attend to such preliminaries as wiping out the Fenachrone fleet."

In due time the reenforcements from the other planets arrived, and the mammoth space-cruiser attracted attention even before it landed, so enormous was she in comparison with the tiny vessels having her in tow. Resting upon the ground, it seemed absurd that such a structure could possibly move under her own power. For two miles that enormous mass of metal extended over the country-side, and while it was very narrow for its length, still its fifteen hundred feet of diameter dwarfed everything near by. But Rovol and his aged co-workers smiled happily as they saw it, erected their keyboards, and set to work with a will.

Meanwhile a group had gathered about a conference table—a group such as had never before been seen together upon any world. There was Fodan, the ancient Chief of the Five of Norlamin, huge-headed, with his leonine mane and flowing beard of white. There were Dunark and Tarnan of Osnome and Urvan of Urvania—smooth-faced and keen, utterly implacable and ruthless in war. There was Saener Carfon Twenty Three Forty Six, the immense, porpoise-like, hairless Dasorian. There were Seaton and Crane, representatives of our own Earthly civilization.

Seaton opened the meeting by handing each man a headset and running a reel showing the plans of the Fenachrone; not only as he had secured them from the captain of the marauding vessel, but also everything the First of Psychology had deduced from his own study of that inhuman brain. He then removed the reel and gave them the tentative plans of battle. Headsets removed, he threw the meeting open for discussion—and discussion there was in plenty. Each man had ideas, which were thrown upon the table and studied, for the most part calmly and dispassionately. The conference continued until only one point was left, upon which argument waxed so hot that everyone seemed shouting at once.

"Order!" commanded Seaton, banging his fist upon the table. "Osnome and Urvania wish to strike without warning, Norlamin and Dasor insist upon a formal declaration of war. Earth has the deciding vote. Mart, how do we vote on this?"

"I vote for formal warning, for two reasons, one of which I believe will convince even Dunark. First, because it is the fair thing to do—which reason is, of course, the one actuating the Norlaminians, but which would not be considered by Osnome, nor even remotely understood by the Fenachrone. Second, I am certain that the Fenachrone will merely be enraged by the warning and will defy us. Then what will they do? You have already said that you have been able to locate only a few of their exploring warships. As soon as we declare war upon them they will almost certainly send out torpedoes to every one of their ships of war. We can then follow the torpedoes with our rays, and thus will be enabled to find and to destroy their vessels."

"That settles that," declared the chairman as a shout of agreement arose. "We shall now adjourn to the projector and send the warning. I have a ray upon the torpedo, announcing the destruction by us of their vessel, and that torpedo will arrive at its destination in less than an hour. It seems to me that we should make our announcement immediately after their ruler has received the news of their first defeat."

In the projector, where they were joined by Rovol, Orlon, and several others of the various "Firsts" of Norlamin, they flashed out to the flying torpedo, and Seaton grinned at Crane as their fifth-order carrier beam went through the far-flung detector screens of the Fenachrone without setting up the slightest reaction. In the wake of that speeding messenger they flew through a warm, foggy, dense atmosphere, through a receiving trap in the wall of a gigantic conical structure, and on into the telegraph room. They saw the operator remove spools of tape from the torpedo and attach them to a magnetic sender—heard him speak.

"Pardon, your majesty—we have just received a first-degree emergency torpedo from flagship Y427W of fleet 42. In readiness."

"Put it on, here in the council chamber," a deep voice snapped.

"If he's broadcasting it, we're in for a spell of hunting," Seaton remarked. "Nope, he's putting it on a tight beam—that's fine, we can chase it up," and with a narrow detector beam he traced the invisible transmission beam into the council room.

"'Sfunny. This place seems awfully familiar—I'd swear I'd seen it before, lots of times—seems like I've been in it, more than once," Seaton remarked, puzzled, as he looked around the somber room, with its dull, paneled metal walls covered with charts, maps, screens, and speakers; and with its low, massive furniture. "Oh, sure, I'm familiar with it from studying the brain of that Fenachrone captain. Well, while His Nibs is absorbing the bad news, we'll go over this once more. You, Carfon, having the biggest voice any of us ever heard uttering intelligible language, are to give the speech. You know about what to say. When I say 'go ahead' do your stuff. Now, everybody else, listen. While he's talking I've got to have audio waves heterodyned both ways in the circuit, and they'll be able to hear any noise any of us make—so all of us except Carfon want to keep absolutely quiet, no matter what happens or what

we see. As soon as he's done I'll cut off the audio sending and say something to let you all know we're off the air. Got it?"

"One point has occurred to me about handling the warning," boomed Carfon. "If it should be delivered from apparently empty air, directly at those we wish to address, it would give the enemy an insight into our methods, which might be undesirable."

"H—m—m. Never thought of that . . . it sure would, and it would be undesirable," agreed Seaton. "Let's see . . . we can get away from that by broadcasting it. They have a very complete system of speakers, but no matter how many private-band speakers a man may have, he always has one on the general wave, which is used for very important announcements of wide interest. I'll broadcast you on that wave, so that every general-wave speaker on the planet will be energized. That way, it'll look as if we're shooting from a distance. You might talk accordingly."

"If we have a minute more, there's something I would like to ask," Dunark broke the ensuing silence. "Here we are, seeing everything that is happening there. Walls, planets, even suns, do not bar our vision, because of the fifth-order carrier wave. I understand that, partially. But how can we see anything there? I always thought that I knew something about rays, but I see that I do not. The light-rays must be released or deheterodyned, close to the object viewed, with nothing opaque to light intervening. They must then be reflected from the object seen, must be gathered together, again heterodyned upon the fifth-order carrier, and retransmitted back to us. And there is neither receiver nor transmitter at the other end. How can you do all that from our end?"

"We don't," Seaton assured him. "At the other end there are all the things you mentioned, and a lot more besides. Our secondary projector out there is composed of forces, visible or invisible, as we please. Part of those forces comprise the receiving, viewing, and sending instruments. They are not material, it is true, but they are nevertheless fully as actual, and far more efficient, than any other system of radio, television, or telephone in existence anywhere else. It is force, you know, that makes radio or television work—the actual copper, insulation, and other matter serve only to guide and to control the various forces employed. The Norlaminian scientists have found out how to direct and control pure forces without using the cumbersome and hindering material substance. . . ."

He broke off as the record from the torpedo stopped suddenly and the operator's voice came through a speaker.

"General Fenimol! Scoutship K3296, patrolling the detector zone, wishes to give you an urgent emergency report. I told them that you were in council with the Emperor, and they instructed me to interrupt it, no matter how important the council may be. They have on board a survivor of the Y427W, and have captured and killed two men of the same race as those who destroyed our vessel. They say that you will want their report without an instant's delay."

"We do!" barked the general, at a sign from his ruler. "Put it on here. Run the rest of the torpedo report immediately afterward."

In the projector, Seaton stared at Crane a moment, then a light of understanding spread over his features.

"DuQuesne, of course—I'll bet a hat no other Terrestrial is this far from home. I can't help feeling sorry for the poor devil—he's a darn good man gone wrong—but we'd have had to kill him ourselves before we got done with him; so it's probably as well they got him. Pin your ears back, everybody, and watch close—we want to get this, all of it."

CHAPTER XIII

The Declaration of War

THE capital city of the Fenachrone lay in a jungle plain surrounded by towering hills. A perfect circle of immense diameter, its buildings of uniform height, of identical design, and constructed of the same dull gray, translucent metal, were arranged in concentric circles, like the annular rings seen upon the stump of a tree. Between each ring of buildings and the one next inside it there were lagoons, lawns and groves—lagoons of tepid, sullenly-steaming water; lawns which were veritable carpets of lush, rank rushes and of dank mosses; groves of palms, gigantic ferns, bamboos, and numerous tropical growths unknown to Earthly botany. At the very edge of the city began jungle unrelieved and primeval; the impenetrable, unconquerable jungle, possible only to such meteorological conditions as obtained there. Wind there was none, nor sunshine. Only occasionally was the sun of that reeking world visible through the omnipresent fog, a pale, wan disk; always the atmosphere was one of oppressive, hot, humid vapor. In the exact center of the city rose an immense structure, a terraced cone of buildings, as though immense disks of smaller and smaller diameter had been piled one upon the other. In these apartments dwelt the nobility and the high officials of the Fenachrone. In the highest disk of all, invisible always from the surface of the planet because of the all-enshrouding mist, were the apartments of the Emperor of that monstrous race.

Seated upon low, heavily-built metal stools about the great table in the council-room were Fenor, Emperor of the Fenachrone; Fenimol, his General-in-Command, and the full Council of Eleven of the planet. Being projected in the air before them was a three-dimensional moving, talking picture—the report of the sole survivor of the warship that had attacked the *Skylark II*. In exact accordance with the facts as the engineer knew them, the details of the battle and complete information concerning the conquerors were shown. As vividly as though the scene were being re-enacted before their eyes they saw the captive revive in the *Violet*, and heard the conversation between the engineer, DuQuesne, and Loring.

In the *Violet* they sped for days and weeks, with ever-mounting velocity, toward the system of the Fenachrone. Finally, power reversed, they approached it, saw the planet looming large, and passed within the detector screen.

DuQuesne tightened the controls of the attractors, which had never been entirely released from their prisoner, thus again pinning the Fenachrone helplessly against the wall.

"Just to be sure you don't try to start something," he explained coldly. "You have done well so far, but I'll run things myself from now on, so that you can't

steer us into a trap. Now tell me exactly how to go about getting one of your vessels. After we get it, I'll see about letting you go."

"Fools, you are too late! You would have been too late, even had you killed me out there in space and had fled at your utmost acceleration. Did you but know it, you are as dead, even now—our patrol is upon you!"

DuQuesne whirled, snarling, and his automatic and that of Loring were leaping out when an awful acceleration threw them flat upon the floor, a magnetic force snatched away their weapons, and a heat-ray reduced them to two small piles of gray ash. Immediately thereafter a beam of force from the patrolling cruiser neutralized the attractors bearing upon the captive, and he was transferred to the rescuing vessel.

The emergency report ended, and with a brief "Torpedo message from flagship Y427W resumed at point of interruption," the report from the ill-fated vessel continued the story of its own destruction, but added little to the already complete knowledge of the disaster.

Fenor of the Fenachrone leaped up from the table, his terrible, flame-shot eyes glaring venomously—teetering in Berserk rage upon his block-like legs—but he did not for one second take his full attention from the report until it had been completed. Then he seized the nearest object, which happened to be his chair, and with all his enormous strength hurled it across the floor, where it lay, a battered, twisted, shapeless mass of metal.

"Thus shall we treat the entire race of the accursed beings who have done this!" he stormed, his heavy voice reverberating throughout the room. "Torture, dismemberment and annihilation to every . . ."

"Fenor of the Fenachrone!" a tremendous voice, a full octave lower than Fenor's own terrific bass, and of ear-shattering volume and timbre in that dense atmosphere boomed from the general-wave speaker, its deafening roar drowning out Fenor's raging voice and every other lesser sound.

"Fenor of the Fenachrone! I know that you hear, for every general-wave speaker upon your reeking planet is voicing my words. Listen well, for this warning shall not be repeated. I am speaking by and with the authority of the Overlord of the Green System, which you know as the Central System of this, our Galaxy. Upon some of our many planets there are those who wished to destroy you without warning and out of hand, but the Overlord has ruled that you may continue to live provided you heed these, his commands, which he has instructed me to lay upon you.

"You must forthwith abandon forever your vainglorious and senseless scheme of universal conquest. You must immediately withdraw your every vessel to within the boundaries of your solar system, and you must keep them there henceforth.

"You are allowed five minutes to decide whether or not you will obey these commands. If no answer has been received at the end of the calculated time the Overlord will know that you have defied him, and your entire race shall perish utterly. Well he knows that your very existence is an affront to all real civilization, but he holds that even such vileness incarnate, as are the Fenachrone, may perchance have some obscure place in the Great Scheme of Things, and he will not destroy you if you are content to remain in your proper place, upon your own dank and steaming world. Through me, the two thousand three hundred and forty-sixth Sacner Carfon of Dasor, the Overlord has given you your first, last and only warning. Heed its every word, or consider it the formal declaration of a war of utter and complete extinction!"

THE awful voice ceased and pandemonium reigned in the council hall. Obeying a common impulse, each Fenachrone leaped to his feet, raised his huge arms aloft, and roared out rage and defiance. Fenor snapped a command, and the others fell silent as he began howling out orders.

"Operator! Send recall torpedoes instantly to every outlying vessel!" He scuttled over to one of the private-band speakers. "X-794-PW! Radio general call for all vessels above E blank E to concentrate on battle stations! Throw out full-power defensive screens, and send the full series of detector screens out to the limit! Guards and patrols on invasion plan XB-218!"

"The immediate steps are taken, gentlemen!" He turned to the Council, his rage unabated. "Never before have we supermen of the Fenachrone been so insulted and so belittled! That upstart Overlord will regret that warning to the instant of his death, which shall be exquisitely postponed. All you of the Council know your duties in such a time as this—you are excused to perform them. General Fenimol, you will stay with me—we shall consider together such other details as require attention."

After the others had left the room Fenor turned to the general.

"Have you any immediate suggestions?"

"I would suggest sending at once for Ravindau, the Chief of the Laboratories of Science. He certainly heard the warning, and may be able to cast some light upon how it could have been sent, and from what point it came."

The Emperor spoke into another sender, and soon the scientist entered, carrying in his hand a small instrument upon which a blue light blazed.

"Do not talk here, there is grave danger of being overheard by that self-styled Overlord," he directed tersely, and led the way into a ray-proof compartment of his private laboratory, several floors below.

"It may interest you to know that you have sealed the doom of our planet and of all the Fenachrone upon it," Ravindau spoke savagely.

"Dare you speak thus to me, your sovereign?" roared Fenor.

"I dare so," replied the other, coldly. "When all the civilization of a planet has been given to destruction by the unreasoning stupidity and insatiable rapacity of its royalty, allegiance to such royalty is at an end. SIT DOWN!" he thundered as Fenor sprang to his feet. You are no longer in your throne-room, surrounded by servile guards and by automatic rays. You are in MY laboratory, and by a movement of my finger I can hurl you into eternity!"

The general, aware now that the warning was of much more serious import than he had suspected, broke into the acrimonious debate.

"Never mind questions of royalty!" he snapped. "The safety of the race is paramount. Am I to understand that the situation is really grave?"

"It is worse than grave—it is desperate. The only hope for even ultimate triumph is for as many of us

as possible to flee instantly clear out of the Galaxy, in the hope that we may escape the certain destruction to be dealt out to us by the Overlord of the Green System."

"You speak folly, surely," returned Fenimol. "Our science is—must be—superior to any other in the Universe?"

"So thought I until this warning came in and I had an opportunity to study it. Then I knew that we are opposed by a science immeasurably higher than our own."

"Such vermin as those two whom one of our smallest scouts captured without a battle, vessel and all? In what respects is their science even comparable to ours?"

"Not those vermin, no. The one who calls himself the Overlord. That one is our master. He can penetrate the impenetrable shield of force and can operate mechanisms of pure force behind it; he can heterodyne, transmit, and use the infra-rays, of whose very existence we were in doubt until recently! While that warning was being delivered he was, in all probability, watching you and listening to you, face to face. You in your ignorance supposed his warning borne by the ether, and thought therefore he must be close to this system. He is very probably at home in the Central System, and is at this moment preparing the forces he intends to hurl against us."

The Emperor fell back into his seat, all his pomposity gone, but the general stiffened eagerly and went straight to the point.

"How do you know these things?"

"Largely by deduction. We of the school of science have cautioned you repeatedly to postpone the Day of Conquest until we should have mastered the secrets of sub-rays and of infra-rays. Unheeding, you of war have gone ahead with your plans, while we of science have continued to study. We know a little of the sub-rays, which we use every day, and practically nothing of the infra-rays. Some time ago I developed a detector for infra-rays, which come to us from outer space in small quantities and which are also liberated by our power-plants. It has been regarded as a scientific curiosity only, but this day it proved of real value. This instrument in my hand is such a detector. At normal impacts of infra-rays its light is blue, as you see it now. Some time before the warning sounded it turned a brilliant red, indicating that an intense source of infra-rays was operating in the neighborhood. By plotting lines of force I located the source as being in the air of the council hall, almost directly above the table of state. Therefore the carrier wave must have come through our whole system of screens without so much as giving an alarm. That fact alone proves it to have been an infra-ray. Furthermore, it carried through those screens and released in the council room a system of forces of great complexity, as is shown by their ability to broadcast from those pure forces without material aid a modulated wave in the exact frequency required to energize our general speakers.

"As soon as I perceived these facts I threw about the council room a screen of force entirely impervious to anything longer than ultra-rays. The warning continued, and I then knew that our fears were only too well grounded—that there is in this Galaxy somewhere a race vastly superior to ours in science and that our destruction is a matter of hours, perhaps of minutes."

"Are these ultra-rays, then, of such a dangerous character?" asked the general. "I had supposed them to be of such infinitely high frequency that they could be of no practical use whatever."

"I HAVE been trying for years to learn something of their nature, but beyond working out a method for their detection and a method of possible analysis that may or may not succeed I can do nothing with them. It is perfectly evident, however, that they lie below the level of the ether, and therefore have a velocity of propagation infinitely greater than that of light. You may see for yourself, then, that to a science able to guide and control them, to make them act as carrier waves for any other desired frequency—to do all of which the Overlord has this day shown himself capable—they should theoretically afford weapons before which our every defense would be precisely as efficacious as so much vacuum. Think a moment! You know that we know nothing fundamental concerning even our servants, the sub-rays. If we really knew them we could utilize them in thousands of ways as yet unknown to us. We work with the merest handful of forces, emperically, while it is practically certain that the enemy has at his command the entire spectrum, visible and invisible, embracing untold thousands of bands, of unknown but terrific potentiality."

"But he spoke of a calculated time necessary before our answer could be received. They must, then, be using vibrations in the ether."

"Not necessarily—not even probably. Would we ourselves reveal unnecessarily to an enemy the possession of such rays? Do not be childish. No, Fenimol, and you, Fenor of the Fenachrone, instant and headlong flight is our only hope of present salvation and of ultimate triumph—flight to a far-distant Galaxy, since upon no point in this one shall we be safe from the infra-beams of that self-styled Overlord."

"You snivelling coward! You pusillanimous bookworm!" Fenor had regained his customary spirit as the scientist explained upon what grounds his fears were based. "Upon such a tenuous fabric of evidence would you have such a people as ours turn tail like beaten hounds? Because, forsooth, you detect a peculiar vibration in the air, will you have it that we are to be invaded and destroyed forthwith by a race of supernatural ability? Bah! Your calamity-howling clan has delayed the Day of Conquest from year to year—I more than half believe that you yourself or some other treacherous poltroon of your ignominious breed prepared and sent that warning, in a weak and rat-brained attempt to frighten us into again postponing the Day of Conquest! Know now, spineless weakling, that the time is ripe, and that the Fenachrone in their might are about to strike. But you, foul traducer of your emperor, shall die the death of the cur you are!" The hand within his tunic moved and a vibrator burst into operation.

"Coward I may be, and pusillanimous, and other things as well," the scientist replied stonily, "but, unlike you, I am not a fool. These walls, this very atmosphere, are fields of force that will transmit no rays directed by you. You weak-minded scion of a depraved and obscene house—arrogant, overbearing, rapacious, ignorant—your brain is too feeble to realize that you are clutching at the Universe hundreds of years before

the time has come. You by your overweening pride and folly have doomed our beloved planet—the most perfect planet in the Galaxy in its grateful warmth and wonderful dampness and fogginess—and our entire race to certain destruction. Therefore you, fool and dolt that you are, shall die—for too long already have you ruled." He flicked a finger and the body of the monarch shuddered as though an intolerable current of electricity had traversed it, collapsed and lay still.

"It was necessary to destroy this that was our ruler," Ravindau explained to the general. "I have long known that you are not in favor of such precipitate action in the Conquest; hence all this talking upon my part. You know that I hold the honor of Fenachrone dear, and that all my plans are for the ultimate triumph of our race?"

"Yes, and I begin to suspect that those plans have not been made since the warning was received."

"My plans have been made for many years; and ever since an immediate Conquest was decided upon I have been assembling and organizing the means to put them into effect. I would have left this planet in any event shortly after the departure of the grand fleet upon its final expedition—Fenor's senseless defiance of the Overlord has only made it necessary for me to expedite my leave-taking."

"What do you intend to do?"

"I have a vessel twice as large as the largest warship Fenor boasted; completely provisioned, armed, and powered for a cruise of one hundred years at high acceleration. It is hidden in a remote fastness of the jungle. I am placing in that vessel a group of the finest, brainiest, most highly advanced and intelligent of our men and women, with their children. We shall journey at our highest speed to a certain distant Galaxy, where we shall seek out a planet similar in atmosphere, temperature, and mass to the one upon which we now dwell. There we shall multiply and continue our studies; and from that planet, in that day when we shall have attained sufficient knowledge, there shall descend upon the Central System of this Galaxy the vengeance of the Fenachrone. That vengeance will be all the sweeter for the fact that it shall have been delayed."

"But how about libraries, apparatus and equipment? Suppose that we do not live long enough to perfect that knowledge? And with only one vessel and a handful of men we could not cope with that accursed Overlord and his navies of the void."

"Libraries are aboard, so are much apparatus and equipment. What we cannot take with us we can build. As for the knowledge I mentioned, it may not be attained in your lifetime nor in mine. But the racial memory of the Fenachrone is long, as you know; and even if the necessary problems are not solved until our descendants are sufficiently numerous to populate an entire planet, yet will those descendants wreak the vengeance of the Fenachrone upon the races of that hated one, the Overlord, before they go on with the Conquest of the Universe. Many questions will arise, of course; but they shall be solved. Enough! Time passes rapidly, and all too long have I talked. I am using this time upon you because in my organization there is no soldier, and the Fenachrone of the future will need your great knowledge of warfare. Are you going with us?"

"Yes."

"Very well." Ravindau led the general through a door and into an airboat lying upon the terrace outside the laboratory. "Drive us at speed to your home, where we shall pick up your family."

Fenimol took the controls and laid a ray to his home—a ray serving a double purpose. It held the vessel upon its predetermined course through that thick and sticky fog and also rendered collision impossible, since any two of these controller rays repelled each other to such a degree that no two vessels could take paths which would bring them together. Some such provision had been found necessary ages ago, for all Fenachrone craft were provided with the same space-annihilating drive, to which any comprehensible distance was but a journey of a few moments, and at that frightful velocity collision meant annihilation.

"I understand that you could not take any one of the military into your confidence until you were ready to put your plans into effect," the general conceded. "How long will it take you to get ready to leave? You have said that haste is imperative, and I therefore assume that you have already warned the other members of the expedition."

"I flashed the emergency signal before I joined you and Fenor in the council room. Each man of the organization has received that signal, wherever he may have been, and by this time most of them, with their families, are on the way to the hidden cruiser. We shall leave this planet in fifteen minutes from now at most—I dare not stay an instant longer than is absolutely necessary."

The members of the general's family were bundled, amazed, into the airboat, which immediately flew along a ray laid by Ravindau to the secret rendezvous.

In a remote and desolate part of the planet, concealed in the depths of the towering jungle growth, a mammoth space-cruiser was receiving her complement of passengers. Airboats, flying at their terrific velocity through the heavy, steaming fog as closely-spaced as their controller rays would permit, flashed signals along their guiding beams, dove into the apparently impenetrable jungle, and added their passengers to the throng pouring into the great vessel.

AS the minute of departure drew near, the feeling of tension aboard the cruiser increased and vigilance was raised to the maximum. None of the passengers had been allowed senders of any description, and now even the hair-line beams guiding the airboats were cut off, and received only when the proper code signal was heard. The doors were shut, no one was allowed outside, and everything was held in readiness for instant flight at the least alarm. Finally a scientist and his family arrived from the opposite side of the planet—the last members of the organization—and, twenty-seven minutes after Ravindau had flashed his signal, the prow of that mighty space-ship reared toward the perpendicular, poising its massive length at the predetermined angle. There it halted momentarily, then disappeared utterly, only a vast column of tortured and shattered vegetation, torn from the ground and carried for miles upward into the air by the vacuum of its wake, remaining to indicate the path taken by the flying projectile.

Hour after hour the Fenachrone vessel bored on, with its frightful and ever-increasing velocity, through the ever-thinning stars, but it was not until the last

star had been passed, until everything before them was entirely devoid of light, and until the Galaxy behind them began to take on a well-defined lenticular aspect, that Ravindau would consent to leave the controls and to seek his hard-earned rest.

Day after day and week after week went by, and the Fenachrone vessel still held the rate of motion with which she had started out. Ravindau and Fenimol sat in the control cabin, staring out through the visiplates, abstracted. There was no need of staring, and they were not really looking, for there was nothing at which to look. Outside the transparent metal hull of that monster of the trackless void, there was nothing visible. The Galaxy of which our Earth is an infinitesimal mote, the Galaxy which former astronomers considered the Universe, was so far behind that its immeasurable diameter was too small to affect the vision of the unaided eye. Other Galaxies lay at even greater distances away on either side. The Galaxy toward which they were making their stupendous flight was as yet untold millions of light-years distant. Nothing was visible—before their gaze stretched an infinity of emptiness. No stars, no nebulæ, no meteoric matter, nor even the smallest particle of cosmic dust—absolutely empty space. Absolute vacuum and absolute zero. Absolute nothingness—a concept intrinsically impossible for the most highly trained human mind to grasp.

Conscienceless and heartless monstrosities though they both were, by heredity and training, the immensity of the appalling lack of anything tangible oppressed them. Ravindau was stern and serious, Fenimol moody. Finally the latter spoke.

"It would be endurable if we knew what had happened, or if we ever could know definitely, one way or the other, whether all this was necessary."

"We shall know, general, definitely. I am certain in my own mind, but after a time, when we have settled upon our new home and when the Overlord shall have relaxed his vigilance, you shall come back to the solar system of the Fenachrone in this vessel or a similar one. I know what you shall find—but the trip shall be made, and you shall yourself see what was once our home planet, a seething sun, second only in brilliance to the parent sun about which she shall still be revolving."

"Are we safe, even now—what of possible pursuit?" asked Fenimol, and the monstrous, flame-shot wells of black that were Ravindau's eyes almost emitted tangible fires as he made reply:

"We are far from safe, but we grow stronger minute by minute. Fifty of the greatest minds our world has ever known have been working from the moment of our departure upon a line of investigation suggested to me by certain things my instruments recorded during the visit of the self-styled Overlord. I cannot say anything yet: even to you—except that the Day of Conquest may not be so far in the future as we have supposed."

CHAPTER XIV

Interstellar Extermination

"I HATE to leave this meeting—it's great stuff" remarked Seaton as he flashed down to the torpedo room at Fenor's command to send recall messages to all outlying vessels, "but this machine isn't designed to let me be in more than two places at once. Wish it were—maybe after this fracas is over we'll be able to incorporate something like that into it."

The chief operator touched a lever and the chair upon which he sat, with all its control panels, slid rapidly across the floor toward an apparently blank wall. As he reached it, a port opened, a metal scroll appeared, containing the numbers and last reported positions of all Fenachrone vessels outside the detector zone, and a vast magazine of torpedoes came up through the floor, with an automatic loader to place a torpedo under the operator's hand the instant its predecessor had been launched.

"Get Peg here quick, Mart—we need a stenographer. Till she gets here, see what you can do in getting those first numbers before they roll off the end of the scroll. No, hold it—as you were! I've got controls enough to put the whole thing on a recorder, so we can study it at our leisure."

Haste was indeed necessary for the operator worked with uncanny quickness of hand. One fleeting glance at the scroll, a lightning adjustment of dials in the torpedo, a touch upon a tiny button, and a messenger was upon its way. But quick as he was, Seaton's flying fingers kept up with him, and before each torpedo disappeared through the ether gate there was fastened upon it a fifth-order tracer ray that would never leave it until the force had been disconnected at the gigantic control board of the Norlaminian projector. One flying minute passed, during which seventy torpedoes had been launched, before Seaton spoke.

"Wonder how many ships they've got out, anyway? Didn't get any idea from the brain-record. Anyway, Rovol, it might be a sound idea for you to install me some more tracer rays on this board, I've got only a couple of hundred, and that may not be enough—and I've got both hands full."

Rovol seated himself beside the younger man, like one organist joining another at the console of a tremendous organ. Seaton's nimble fingers would flash here and there, depressing keys and manipulating controls until he had exactly the required combination of forces centered upon the torpedo next to issue. He then would press a tiny switch and upon a panel full of red-topped, numbered plungers, the one next in series would drive home, transferring to itself the assembled beam and releasing the keys for the assembly of other forces. Rovol's fingers were also flying, but the forces he directed were seizing and shaping material, as well as other forces. The Norlaminian physicist set up one integral, stepped upon a pedal, and a new red-topped stop precisely like the others and numbered in order, appeared as though by magic upon the panel at Seaton's left hand. Rovol then leaned back in his seat—but the red-topped stops continued to appear, at the rate of exactly seventy per minute, upon the panel, which increased in width sufficiently to accommodate another row as soon as a row was completed.

Rovol bent a quizzical glance upon the younger scientist, who blushed a fiery red, rapidly set up another integral, then also leaned back in his place, while his face burned deeper than before.

"That is better, son. Never forget that it is a waste of energy to do the same thing twice with your hands and that if you know precisely what is to be done, you need not do it with your hands at all. Forces are tireless, and they neither slip nor make mistakes."

"Thanks, Rovol—I'll bet this lesson will make it stick in my mind, too."

"You are not thoroughly accustomed to using all your knowledge as yet. That will come with practice, however, and in a few weeks you will be as thoroughly at home with forces as I am."

"Hope so, Chief, but it looks like a tall order to me."

Finally the last torpedo was dispatched, the tube closed, and Seaton moved the projection back up into the council chamber, finding it empty.

"Well, the conference is over—besides, we've got more important fish to fry. War has been declared, on both sides, and we've got to get busy. They've got nine hundred and six vessels out, and every one of them has got to go to Davy Jones' locker before we can sleep sound of nights. My first job'll have to be untangling those nine oh six forces, getting lines on each one of them, and seeing if I can project straight enough to find the ships before the torpedoes overtake them. Mart, you and Orlon, the astronomer, had better dope out the last reported positions of each of those vessels, so we'll know about where to hunt for them. Rovol, you might send out a detector screen a few light years in diameter, to be sure none of them slips a fast one over on us. By starting it right here and expanding it gradually, you can be sure that no Fenachrone is inside it. Then we'll find a hunk of copper on that planet somewhere, plate it with some of their own 'X' metal, and blow them into Kingdom Come."

"May I venture a suggestion?" asked Drasnik, the First of Psychology.

"Absolutely—nothing you've said so far has been idle chatter."

"You know, of course, that there are real scientists among the Fenachrone; and you yourself have suggested that while they cannot penetrate the zone of force nor use fifth-order rays, yet they might know about them in theory, might even be able to know when they were being used—detect them, in other words. Let us assume that such a scientist did detect your rays while you were there a short time ago. What would he do?"

"Search me. . . . I bite, what would he do?"

"He might do any one of several things, but if I read their nature aright, such a one would gather up a few men and women—as many as he could—and migrate to another planet. For he would of course grasp instantly the fact that you had used fifth-order rays as carrier waves, and would be able to deduce your ability to destroy. He would also realize that in the brief time allowed him, he could not hope to learn to control those unknown forces; and with his terribly savage and vengeful nature and intense pride of race, he would take every possible step both to perpetuate his race and to obtain revenge. Am I right?"

SEATON swung to his controls savagely, and manipulated dials and keys rapidly.

"Right as rain, Drasnik. There—I've thrown around them a fifth-order detector screen, that they can't possibly neutralize. Anything that goes out through it will have a tracer slapped onto it. But say, it's been half an hour since war was declared—suppose we're too late? Maybe some of them have got away already, and if one couple of 'em has beat us to it, we'll have the whole thing to do over again a thousand years or so from now. You've got the massive intellect, Drasnik. What can we do about it? We can't throw a detector screen all over the Galaxy."

"I would suggest that since you have now guarded against further exodus, it is necessary to destroy the planet for a time. Rovol and his co-workers have the other projector nearly done. Let them project me to the world of the Fenachrone, where I shall conduct a thorough mental investigation. By the time you have taken care of the raiding vessels, I believe that I shall have been able to learn everything we need to know."

"Fine—hop to it, and may there be lots of bubbles in your think-tank. Anybody else know of any other loop-holes I've left open?"

No other suggestions were made, and each man bent to his particular task. Crane at the star-chart of the Galaxy and Orlon at the Fenachrone operator's dispatching scroll rapidly worked out the approximate positions of the Fenachrone vessels, and marked them with tiny green lights in a vast model of the Galaxy which they had already caused forces to erect in the air of the projector's base. It was soon learned that a few of the ships were exploring quite close to their home system; so close that the torpedoes, with their unthinkable acceleration, would reach them within a few hours. Ascertaining the stop-number of the tracer ray upon the torpedo which should first reach its destination, Seaton followed it from the stop upon his panel out to the flying messenger. Now moving with a velocity many times that of light, it was, of course, invisible to direct vision; but to the light waves heterodyned upon the fifth-order projector rays, it was as plainly visible as though it were stationary. Lining up the path of the projectile accurately, he then projected himself forward in that exact line, with a flat detector-screen thrown out for half a light year upon each side of him. Setting the controls, he flashed ahead, the detector stopping him the instant that the invisible barrier encountered the power-plant of the exploring raider. An oscillator sounded a shrill and rising note, and Seaton slowly shifted his controls until he stood in the control room of the enemy vessel.

The Fenachrone ship, a thousand feet long and more than a hundred feet in diameter, was tearing through space toward a brilliant blue-white star. Her crew were at battle stations, her navigating officers peering intently into the operating visiplates, all oblivious to the fact that a stranger stood in their very midst.

"Well, here's the first one, gang," said Seaton, "I hate like sin to do this—it's altogether too much like pushing baby chickens into a creek to suit me, but it's a dirty job that's got to be done."

As one man, Orlon and the other remaining Norlaminians leaped out of the projector and floated to the ground below.

"I expected that," remarked Seaton. "They can't even think of a thing like this without getting the blue willies—I don't blame them much, at that. How about you, Carfon? You can be excused if you like."

"I want to watch those forces at work. I do not enjoy destruction, but like you, I can make myself endure it."

Dunark, the fierce and bloodthirsty Osnomian prince, leaped to his feet, his eyes flashing.

"That's one thing I never could get about you, Dick!" he exclaimed in English. "How a man with your brains can be so soft—so sloppily sentimental, gets clear past me. You remind me of a bowl of mush—you wade

around in slush clear to your ears. Faugh! It's their lives or ours! Tell me what button to push and I'll be only too glad to push it. I wanted to blow up Urvania and you wouldn't let me; I haven't killed an enemy for ages, and that's my trade. Cut out the sob-sister act and for Cat's sake, let's get busy!"

"'At-a-boy, Dunark! That's tellin' 'im! But it's all right with me—I'll be glad to let you do it. When I say 'shoot' throw in that plunger there—number sixty-three."

Seaton manipulated controls until two electrodes of force were clamped in place, one at either end of the huge power-bar of the enemy vessel; adjusted rheostats and forces to send a disintegrating current through that massive copper cylinder, and gave the word. Dunark threw in the switch with a vicious thrust, as though it were an actual sword which he was thrusting through the vitals of one of the awesome crew, and the very Universe exploded around them—exploded into one mad, searing coruscation of blinding, dazzling light as the gigantic cylinder of copper resolved itself instantaneously into the pure energy from which its metal originally had come into being.

Seaton and Dunark staggered back from the visiplates, blinded by the intolerable glare of light, and even Crane, working at his model of the galaxy, blinked at the intensity of the radiation. Many minutes passed before the two men could see through their tortured eyes.

"Zowie! That was fierce!" exclaimed Seaton, when a slowly-returning perception of things other than dizzy spirals and balls of flame assured him that his eyesight was not permanently gone. "It's nothing but my own fool carelessness, too. I should have known that with all the light frequencies in heterodyne for visibility, enough of that same stuff would leak through to make strong medicine on these visiplates—for I knew that that bar weighed a hundred tons and would liberate energy enough to volatilize our Earth and blow the by-products clear to Arcturus. How're you coming, Dunark? See anything yet?"

"Coming along O. K. now, I guess—but I thought for a few minutes I'd been bloody well jobbed."

"I'll do better next time. I'll cut out the visible spectrum before the flash, and convert and reconvert the infra-red. That'll let us see what happens, without the direct effect of the glare—won't burn our eyes out. What's my force number on the next nearest one, Mart?"

"Twenty-nine."

SEATON fastened a detector ray upon stop twenty-nine of the tracer-ray panel and followed its beam of force out to the torpedo hastening upon its way toward the next doomed cruiser. Flashing ahead in its line as he had done before, he located the vessel and clamped the electrodes of force upon the prodigious driving bar. Again, as Dunark drove home the detonating switch, there was a frightful explosion and a wild glare of frenzied incandescence far out in that desolate region of interstellar space; but this time the eyes behind the visiplates were not torn by the high frequencies, everything that happened was plainly visible. One instant, there was an immense space-cruiser boring on through the void upon its horrid mission, with its full complement of the hellish Fenachrone performing their routine tasks. The next instant there was a flash of light extending for thousands upon untold thousands of miles in every direction. That flare of light vanished as rapidly as it had appeared—instantaneously—and throughout the entire neighborhood of the place where the Fenachrone cruiser had been, there was nothing. Not a plate nor a girder, not a fragment, not the most minute particle nor droplet of disrupted metal nor of condensed vapor. So terrific, so incredibly and incomprehensibly vast were the forces liberated by that mass of copper in its instantaneous decomposition, that every atom of substance in that great vessel had gone with the power-bar—had been resolved into radiations which would at some distant time and in some far-off solitude unite with other radiations, again to form matter, and thus obey Nature's immutable cyclic law.

Thus vessel after vessel was destroyed of that haughty fleet which until now had never suffered a reverse, and a little green light in the galactic model winked out and flashed back in rosy pink as each menace was removed. In a few hours the space surrounding the system of the Fenachrone was clear; then progress slackened as it became harder and harder to locate each vessel as the distance between it and its torpedo increased. Time after time Seaton would stab forward with his detector screen extended to its utmost possible spread, upon the most carefully plotted prolongation of the line of the torpedo's flight, only to have the projection flash far beyond the vessel's furthest possible position without a reaction from the far-flung screen. Then he would go back to the torpedo, make a minute alteration in his line, and again flash forward, only to miss it again. Finally, after thirty fruitless attempts to bring his detector screen into contact with the nearest Fenachrone ship, he gave up the attempt, rammed his battered, reeking briar full of the rank blend that was his favorite smoke, and strode up and down the floor of the projector base—his eyes unseeing, his hands jammed deep into his pockets, his jaw thrust forward, clamped upon the stem of his pipe, emitting dense, blue clouds of strangling vapor.

"The maestro is thinking, I perceive," remarked Dorothy, sweetly, entering the projector from an airboat. "You must all be blind, I guess—you no hear the bell blow, what? I've come after you—it's time to eat!"

"'At-a-girl, Dot—never miss the eats! Thanks," and Seaton put his problem away, with perceptible effort.

"This is going to be a job, Mart," he went back to it as soon as they were seated in the airboat, flying toward "home." "I can nail them; with an increasing shift in azimuth, up to about thirty thousand light-years, but after that it gets awfully hard to get the right shift, and up around a hundred thousand it seems to be darn near impossible—gets to be pure guesswork. It can't be the controls, because they can hold a point rigidly at five hundred thousand. Of course, we've got a pretty short back-line to sight on, but the shift is more than a hundred times as great as the possible error in my back-sight could account for, and there's apparently nothing either regular or systematic about it that I can figure out. But . . . I don't know. . . . Space is curved in the fourth dimension, of course . . . I wonder if . . . hm—m—m." He fell silent and Crane made a rapid signal to Dorothy, who was opening her mouth to say something. She shut it, feeling ridiculous, and nothing was said until they had disembarked at their destination.

"Did you solve the puzzle, Dickie?"

"Don't think so—got myself in deeper than ever, I'm afraid," he answered, then went on, thinking aloud rather than addressing any one in particular:

"Space is curved in the fourth dimension, and fifth-order rays, with their velocity, may not follow the same path in that dimension that light does—in fact, they do not. If that path is to be plotted it requires the solution of five simultaneous equations, each complete and general, and each of the fifth degree, and also an exponential series with the unknown in the final exponent, before the fourth-dimensional concept can be derived . . . hm—m—m. No use—we've struck something that not even Norlaminian theory can handle."

"You surprise me," Crane said. "I supposed that they had everything worked out."

"Not on fifth-order stuff—it's new, you know. It begins to look as though we'd have to stick around until every one of those torpedoes gets somewhere near its mother-ship. Hate to do it, too—it'll take six months, at least, to reach the vessels clear across the Galaxy. I'll put it up to the gang at dinner—guess they'll let me talk business a couple of minutes overtime, especially after they find out what I've got to say."

He explained the phenomenon to an interested group of white-bearded scientists as they ate. Rovol, to Seaton's surprise, was elated and enthusiastic.

"Wonderful, my boy!" he breathed. "Marvelous! A perfect subject for year after year of deepest study and the most profound thought. Perfect!"

"But what can we *do* about it?" asked Seaton, exasperated. "We don't want to hang around here twiddling our thumbs for a year waiting for those torpedoes to get to wherever they're going!"

"We can do nothing but wait and study. That problem is one of splendid difficulty, as you yourself realize. Its solution may well be a matter of lifetimes instead of years. But what is a year, more or less? You can destroy the Fenachrone eventually, so be content."

"But content is just exactly what I'm *not!*" declared Seaton, emphatically. "I want to do it, and do it *now!*"

"Perhaps I might volunteer a suggestion," said Caslor, diffidently; and as both Rovol and Seaton looked at him in surprise he went on: "Do not misunderstand me. I do not mean concerning the mathematical problem in discussion, about which I am entirely ignorant. But has it occurred to you that those torpedoes are not intelligent entities, acting upon their own volition and steering themselves as a result of their own ordered mental processes? No, they are mechanisms, in my own province, and I venture to say with the utmost confidence that they are guided to their destinations by streamers of force of some nature, emanating from the vessels upon whose tracks they are."

"'Nobody Holme' is right!" exclaimed Seaton, tapping his temple with an admonitory forefinger. "'Sright, ace—I thought maybe I'd quit using my head for nothing but a hatrack now, but I guess that's all it's good for, yet. Thanks a lot for the idea—that gives me something I can get my teeth into, and now that Rovol's got a problem to work on for the next century or so, everybody's happy."

"How does that help matters?" asked Crane in wonder. "Of course it is not surprising that no lines of force were visible, but I thought that your detector screens would have found them if any such guiding beams had been present."

"The ordinary bands, if of sufficient power, yes. But there are many possible tracer rays not reactive to a screen such as I was using. It was very light and weak, designed for terrific velocity and for instantaneous automatic arrest when in contact with the enormous forces of a power bar. It wouldn't react at all to the minute energy of the kind of beams they'd be most likely to use for that work. Caslor's certainly right. They're steering their torpedoes with tracer rays of almost infinitesimal power, amplified in the torpedoes themselves—that's the way I'd do it myself. It may take a little while to rig up the apparatus, but we'll get it—and then we'll run those birds ragged—so fast that their ankles'll catch fire—and won't need the fourth-dimensional correction after all."

WHEN the bell announced the beginning of the following period of labor, Seaton and his co-workers were in the Area of Experiment waiting, and the work was soon under way.

"How are you going about this, Dick?" asked Crane.

"Going to examine the nose of one of those torpedoes first, and see what it actually works on. Then build me a tracer detector that'll pick it up at high velocity. Beats the band, doesn't it, that neither Rovol nor I, who should have thought of it first, ever did see anything as plain as that? That those things are following a ray?"

"That is easily explained, and is no more than natural. Both of you were not only devoting all your thoughts to the curvature of space, but were also too close to the problem—like the man in the woods, who cannot see the forest because of the trees."

"Yeah, may be something in that, too. Plain enough, when Caslor showed it to us," said Seaton.

While he was talking, Seaton had projected himself into the torpedo he had lined up so many times the previous day. With the automatic motions set to hold him stationary in the tiny instrument compartment of the craft, now traveling at a velocity many times that of light, he set to work. A glance located the detector mechanism, a set of short-wave coils and amplifiers, and a brief study made plain to him the principles underlying the directional loop finders and the controls which guided the flying shell along the path of the tracer ray. He then built a detector structure of pure force immediately in front of the torpedo, and varied the frequency of his own apparatus until a meter upon one of the panels before his eyes informed him that his detector was in perfect resonance with the frequency of the tracer ray. He then moved ahead of the torpedo, along the guiding ray.

"Getting it, eh?" Dunark congratulated him.

"Kinda. My directors out there aren't quite so hot, though. I'm a trifle shy on control somewhere, so much so that if I put on anywhere near full velocity, I lose the ray. Think I can clear that up with a little experimenting, though."

He fingered controls lightly, depressed a few more keys, and set one vernier, already at a ratio of a million to one, down to ten million. He then stepped up his velocity, and found that the guides worked well up to a speed much greater than any ever reached by the Fenachrone vessels or torpedoes, but failed utterly to hold the ray at anything approaching the full velocity possible to his fifth-order projector. After hours and days of work and study—in the course of which hun-

dreds of the Fenachrone vessels were destroyed—after employing all the resources of his mind, now stored with the knowledge of rays accumulated by hundreds of generations of highly-trained research specialists in rays, he became convinced that it was an inherent impossibility to trace any ether wave with the velocity he desired."

"Can't be done, I guess, Mart," he confessed, ruefully. "You see, it works fine up to a certain point; but beyond that, nothing doing. I've just found out why—and in so doing, I think I've made a contribution to science. At velocities well below that of light, light-waves are shifted a minute amount, you know. At the velocity of light, and up to a velocity not even approached by the Fenachrone vessels on their longest trips, the distortion is still not serious—no matter how fast we want to travel in the *Skylark*, I think I can guarantee that we will still be able to see things. That is to be expected from the generally-accepted idea that the apparent velocity of any ether vibration is independent of the velocity of either source or receiver. However, that relationship fails at velocities far below that of fifth-order rays. At only a very small fraction of that speed the tracers I am following are so badly distorted that they disappear altogether, and I have to distort them backwards. That wouldn't be too bad, but when I get up to about one per cent. of the velocity I want to use, I can't calculate a force that will operate to distort them back into recognizable wave-forms. That's another problem for Rovol to chew on, for another hundred years."

"That will, of course, slow up the work of clearing the Galaxy of the Fenachrone, but at the same time I see nothing about which to be alarmed," Crane replied. "You are working very much faster than you could have done by waiting for the torpedoes to arrive. The present condition is very satisfactory, I should say," and he waved his hand at the galactic model, in nearly three-fourths of whose volume the green lights had been replaced by pink ones.

"Yeah, pretty fair as far as that goes—we'll clean up in ten days or so—but I hate to be licked. Well, I might as well quit sobbing and get busy!"

In due time the nine hundred and sixth Fenachrone vessel was checked off on the model, and the two Terrestrials went in search of Drasnik, whom they found in his study, summing up and analyzing a mass of data, facts, and ideas which were being projected in the air around him.

"Well, our first job's done," Seaton stated. "What do you know that you feel like passing around?"

"My investigation is practically complete," replied the First of Psychology, gravely. "I have explored many Fenachrone minds, and without exception I have found them chambers of horror of a kind unimaginable to one of us. However, you are not interested in their psychology, but in facts bearing upon your problem. While such facts were scarce, I did discover a few interesting items. I spied upon them in public and in their most private haunts. I analyzed them individually and collectively, and from the few known facts and from the great deal of guesswork and conjecture there available to me, I have formulated a theory. I shall first give you the known facts. Their scientists cannot direct nor control any ray not propagated through ether, but they can detect one such frequency or band of frequencies which they call 'infra-rays' and which are probably the fifth-order rays, since they lie in the first level below the ether. The detector proper is a type of lamp, which gives a blue light at the ordinary intensity of such rays as would come from space or from an ordinary power plant, but gives a red light under strong excitation."

"Uh-huh, I get that O. K.," said Seaton. "Rovol's great-great-great-grandfather had 'em—I know all about 'em," Seaton encouraged Drasnik, who had paused, with a questioning glance. "I know exactly how and why such a detector works. We gave 'em an alarm, all right. Even though we were working on a tight beam from here to there, our secondary projector there was radiating enough to affect every such detector within a thousand miles."

DRASNIK continued: "Another significant fact is that a great many persons—I learned of some five hundred, and there were probably many more—have disappeared without explanation and without leaving a trace; and it seems that they disappeared very shortly after our communication was delivered. One of these was Fenor, the Emperor. His family remain, however, and his son is not only ruling in his stead, but is carrying out his father's policies. The other disappearances are all alike and are peculiar in certain respects. First, every man who vanished belonged to the party of postponement—the minority party of the Fenachrone, who believe that the time for the Conquest has not yet come. Second, every one of them was a leader in thought in some field of usefulness, and every such field is represented by at least one disappearance—even the army, as General Fenimol, the Commander-in-Chief, and his whole family, are among the absentees. Third, and most remarkable, each such disappearance included an entire family, clear down to children and grand-children, however young. Another fact is that the Fenachrone Department of Navigation keeps a very close check upon all vessels, particularly vessels capable of navigating outer space. Every vessel built must be registered, and its location is aways known from its individual tracer ray. No Fenachrone vessel is missing."

"I also sifted a mass of gossip and conjecture, some of which may bear upon the subject. One belief is that all the persons were put to death by Fenor's secret service, and that the Emperor was assassinated in revenge. The most widespread belief, however, is that they have fled. Some hold that they are in hiding in some remote shelter in the jungle, arguing that the rigid registration of all vessels renders a journey of any great length impossible and that the detector screens would have given warning of any vessel leaving the planet. Others think that persons as powerful as Fenimol and Ravindau could have built any vessel they chose with neither the knowledge nor consent of the Department of Navigation, or that they could have stolen a Navy vessel, destroying its records; and that Ravindau certainly could have so neutralized the screens that they would have given no alarm. These believe that the absent ones have migrated to some other solar system or to some other planet of the same sun. One old general loudly gave it as his opinion that the cowardly traitors had probably fled clear out of the Galaxy, and that it would be a good thing to send the rest of the Party of Postponement after them. There, in brief, are the salient points of my investigation in so far as it concerns your immediate problem."

"A good many straws pointing this way and that," commented Seaton. "However, we know that the 'postponers' are just as rabid on the idea of conquering the Universe as the others are—only they are a lot more cautious and won't take even a gambler's chance of a defeat. But you've formed a theory—what is it, Drasnik?"

"From my analysis of these facts and conjectures, in conjunction with certain purely psychological indices which we need not take time to go into now, I am certain that they have left their solar system, probably in an immense vessel built a long time ago and held in readiness for just such an emergency. I am not certain of their destination, but it is my opinion that they have left this Galaxy, and are planning upon starting anew upon some suitable planet in some other Galaxy, from which, at some future date, the Conquest of the Universe shall proceed as it was originally planned."

"Great balls of fire!" blurted Seaton. "They couldn't—not in a million years!" He thought a moment, then continued more slowly: "But they could—and, with their dispositions, they probably would. You're one hundred per cent. right, Drasnik. We've got a real job of hunting on our hands now. So-long, and thanks a lot."

Back in the projector Seaton prowled about in brown abstraction, his villainous pipe poisoning the circumambient air, while Crane sat, quiet and self-possessed as always, waiting for the nimble brain of his friend to find a way over, around, or through the obstacle confronting them.

"Got it, Mart!" Seaton yelled, darting to the board and setting up one integral after another. "If they did leave the planet in a ship, we'll be able to watch them go—and we'll see what they did, anyway, no matter what it was!"

"How? They've been gone almost a month already," protested Crane.

"We know within half an hour the exact time of their departure. We'll simply go out the distance light has traveled since that time, gather in the rays given off, amplify them a few billion times, and take a look at whatever went on."

"But we have no idea of what region of the planet to study, or whether it was night or day at the point of departure when they left."

"We'll get the council room, and trace events from there. Day or night makes no difference—we'll have to use infra-red anyway, because of the fog, and that's almost as good at night as in the daytime. There is no such thing as absolute darkness upon any planet, anyway, and we've got power enough to make anything visible that happened there, night or day. Mart, I've got power enough here to see and to photograph the actual construction of the pyramids of Egypt in that same way—and they were built thousands of years ago!"

"Heavens, what astounding possibilities!" breathed Crane. "Why, you could . . ."

"Yeah, I could do a lot of things," Seaton interrupted him rudely, "but right now we've got other fish to fry. I've just got the city we visited, at about the time we were there. General Fenimol, who disappeared, must be in the council room down here right now. I'll retard our projection, so that time will apparently pass more quickly, and we'll duck down there and see what actually did happen. I can heterodyne, combine, and recombine just as though we were watching the actual scene—it's more complicated, of course, since I have to follow it and amplify it too, but it works out all right."

"This is unbelievable, Dick. Think of actually seeing something that really happened in the past!"

"Yeah, it's kinda strong, all right. As Dot would say, it's just too perfectly darn outrageous. But we're doing it, ain't we? I know just how, and why. When we get some time I'll shoot the method into your brain. Well, here we are!"

PEERING into the visiplates, the two men were poised above the immense central cone of the capital city of the Fenachrone. Viewing with infra-red light as they were, the fog presented no obstacle and the indescribable beauty of the city of concentric rings and the wonderfully luxuriant jungle growth were clearly visible. They plunged down into the council chamber, and saw Fenor, Ravindan, and Fenimol deep in conversation.

"With all the other feats of skill and sorcery you have accomplished, why don't you reconstruct their speech, also?" asked Crane, with a challenging glance.

"Well, old Doubting Thomas, it might not be absolutely impossible, at that. It would mean two projectors, however, due to the difference in speed of sound-waves and light-waves. Theoretically, sound-waves also extend to an infinite distance, but I don't believe that any possible detector and amplifier could reconstruct a voice more than an hour or so after it had spoken. It might, though—we'll have to try it some time, and see. You're fairly good at lip-reading, as I remember it. Get as much of it as you can, will you?"

As though they were watching the scene itself as it happened—which, in a sense, they were—they saw everything that had occurred. They saw Fenor die, saw the general's family board the airboat, saw the orderly embarkation of Ravindan's organization. Finally they saw the stupendous take-off of the first inter-galactic cruiser, and with that take-off, Seaton went into action. Faster and faster he drove that fifth-order beam along the track of the fugitive, until a speed was attained beyond which his detecting converters could not hold the ether-rays they were following. For many minutes Seaton stared intently into the visiplate, plotting lines and calculating forces, then he swung around to Crane.

"Well, Mart, noble old bean, solving the disappearances was easier than I thought it would be; but the situation as regards wiping out the last of the Fenachrone is getting no better, fast.

"I glean from the instruments that they are heading straight out into space away from the Galaxy, and I assume that they are using their utmost acceleration?

"I'll say they're traveling! They're out in absolute space, you know, with nothing in the way and with no intention of reversing their power or slowing down—they must've had absolute top acceleration on every minute since they left. Anyway, they're so far out already that I couldn't hold even a detector on them, let alone a force that I can control. Well, let's snap into it, fellow—on our way!"

"Just a minute, Dick. Take it easy, what are your plans?"

"Plans! Why worry about plans? Blow up that planet before any more of 'em get away, and then chase that boat clear to Andromeda, if necessary. Let's go!"

"Calm down and be reasonable—you are getting

hysterical again. They have a maximum acceleration of five times the velocity of light. So have we, exactly, since we adopted their own drive. Now if our acceleration is the same as theirs, and they have a month's start, how long will it take us to catch them?"

"Right again, Mart—I sure was going off half-cocked again," Seaton conceded ruefully, after a moment's thought. "They'd always be going a million or so times as fast as we would be, and getting further ahead of us in geometrical ratio. What's your idea?"

"I agree with you that the time has come to destroy the planet of Fenachrone. As for pursuing that vessel through intergalactic space, that is your problem. You must figure out some method of increasing our acceleration. Highly efficient as is this system of propulsion, it seems to me that the knowledge of the Norlaminians should be able to improve it in some detail. Even a slight increase in acceleration would enable us to overtake them eventually."

"Hm—m—m." Seaton, no longer impetuous, was thinking deeply. "How far are we apt to have to go?"

"Until we get close enough to them to use your rays—say half a million light-years."

"But surely they'll stop, some time?"

"Of course, but not necessarily for many years. They are powered and provisioned for a hundred years, you remember, and are going to 'a distant galaxy.' Such a one as Ravindau would not have specified a *distant* Galaxy idly, and the very closest Galaxies are so far away that even the Fenachrone astronomers, with their reflecting mirrors five miles in diameter, could form only the very roughest approximations of the true distances."

"Our astronomers are all wet in their guesses, then?"

"Their estimates are, without exception, far below the true values. They are not even of the correct order of magnitude."

"Well, then, let's mop up on that planet. Then we'll go places and do things."

Seaton had already located the magazines in which the power bars of the Fenachrone war-vessels were stored, and it was a short task to erect a secondary projector of force in the Fenachrone atmosphere. Working out of that projector, beams of force seized one of the immense cylinders of plated copper and at Seaton's direction transported it rapidly to one of the poles of the planet, where electrodes of force were clamped upon it. In a similar fashion seventeen more of the frightful bombs were placed, equidistant over the surface of the world of the Fenachrone, so that when they were simultaneously exploded, the downward forces would be certain to meet sufficient resistance to assure complete demolition of the entire globe. Everything in readiness, Seaton's hand went to the plunger switch and closed upon it. Then, his face white and wet, he dropped his hand.

"No use, Mart—I can't do it. It pulls my cork. I know darn well you can't either—I'll yell for help."

"Have you got it on the infra-red?" asked Dunark calmly, as he shot up into the projector in reply to Seaton's call. "I want to see this, all of it."

"It's on—you're welcome to it," and, as the Terrestrials turned away, the whole projector base was illuminated by a flare of intense, though subdued light. For several minutes Dunark stared into the visiplate, savage satisfaction in every line of his fierce green face as he surveyed the havoc wrought by those eighteen enormous charges of incredible explosive.

"A nice job of clean-up, Dick," the Osnomian prince reported, turning away from the visiplate. "It made a sun of it—the original sun is now quite a splendid double star. Everything was volatilized, clear out, far beyond their outermost screen."

"It had to be done, of course—it was either them or else all the rest of the Universe," Seaton said, jerkily. "However, even that fact doesn't make it go down easy. Well, we're done with this projector. From now on it's strictly up to us and *Skylark Three*. Let's beat it over there and see if they've got her done yet—they were due to finish up today, you know."

IT was a silent group who embarked in the little airboat. Half way to their destination, however, Seaton came out of his blue mood with a yell.

"Mart, I've got it! We can give the *Lark* a lot more acceleration than they are getting—and won't need the assistance of all the minds of Norlamin, either."

"How?"

"By using one of the very heavy metals for fuel. The intensity of the power liberated is a function of atomic weight, or atomic number, and density; but the fact of liberation depends upon atomic configuration—a fact which you and I figured out long ago. However, our figuring didn't go far enough—it couldn't: we didn't know anything then. Copper happens to be the most efficient of the few metals which can be decomposed at all under ordinary excitation—that is, by using an ordinary coil, such as we and the Fenachrone both use. But by using special exciters, sending out all the orders of rays necessary to initiate the disruptive processes, we can use any metal we want to. Osnome has unlimited quantities of the heaviest metals, including radium and uranium. Of course we can't use radium and live—but we can and will use uranium, and that will give us something like four times the acceleration possible with copper. Dunark, what say you snap over there and smelt us a cubic mile of uranium? No—hold it—I'll put a flock of forces on the job. They'll do it quicker, and I'll make 'em deliver the goods. They'll deliver 'em fast, too, believe us—we'll see to that with a ten-ton bar. The uranium bars'll be ready to load tomorrow, and we'll have enough power to chase those birds all the rest of our lives!"

Returning to the projector, Seaton actuated the complex system of forces required for the smelting and transportation of the enormous amount of metal necessary, and as the three men again boarded their aerial conveyance, the power-bar in the projector behind them flared into violet incandescence under the load already put upon it by the new uranium mine in distant Osnome.

The *Skylark* lay stretched out over two miles of country, exactly as they had last seen her, but now, instead of being water-white, the ten-thousand-foot cruiser of the void was one jointless, seamless structure of sparkling, transparent, purple inoson. Entering one of the open doors, they stepped into an elevator and were whisked upward into the control room, in which a dozen of the aged, white-bearded students of Norlamin were grouped about a banked and tiered mass of keyboards, which Seaton knew must be the operating mechanism of the extraordinarily complete fifth-order projector he had been promised.

"Ah, youngsters, you are just in time. Everything is complete, and we are just about to begin loading."

"Sorry, Rovol, but we'll have to make a couple of changes—have to rebuild the exciter or build another one," and Seaton rapidly related what they had learned, and what they had decided to do.

"Of course, uranium is a much more efficient source of power," agreed Rovol, "and you are to be congratulated for thinking of it. It perhaps would not have occurred to one of us, since the heavy metals of that highly efficient group are very rare here. Building a new exciter for uranium is a simple task, and the converters for the corona-loss will, of course, require no change, since their action depends only upon the frequency of the emitted losses, not upon their magnitude."

"Hadn't you suspected that some of the Fenachrone might be going to lead us a life-long chase?" asked Dunark curiously.

"We have not given the matter a thought, my son," the Chief of the Five made answer. "As your years increase, you will learn not to anticipate trouble and worry. Had we thought and worried over the matter before the time had arrived, you will note that it would have been pain wasted, for our young friend Seaton has avoided that difficulty in a truly scholarly fashion."

"All set, then, Rovol?" asked Seaton, when the forces flying from the projector had built the compound exciter which would make possible the disruption of the atoms of uranium. "The metal, enough of it to fill all the spare space in the hull, will be here tomorrow. You might give Crane and me the method of operating this projector, which I see is vastly more complex even than the one in the Area of Experiment."

"It is the most complete thing ever seen upon Norlamin," replied Rovol with a smile. "Each of us installed everything in it that he could conceive of ever being of the slightest use, and since our combined knowledge covers a large field, the projector is accordingly quite comprehensive."

Multiple headsets were donned, and from each of the Norlaminian brains there poured into the minds of the two Terrestrials a complete and minute knowledge of every possible application of the stupendous force-control banked in all its massed intricacy before them.

"Well, that's some outfit!" exulted Seaton in pleased astonishment as the instructions were concluded. "It can do anything but lay an egg—and I'm not a darn bit sure that we couldn't make it do that! Well, let's call the girls and show them around this thing that's going to be their home for quite a while."

While they were waiting, Dunark led Seaton aside.

"Dick, will you need me on this trip?" he asked. "Of course I knew there was something on your mind when you didn't send me home when you let Urvan, Carfon and the others go back."

"No, we're going it alone—unless you want to come along. I did want you to stick around until I got a good chance to talk to you alone—now will be as good a time as any. You and I have traded brains, and besides, we've been through quite a lot of grief together, here and there—I want to apologize to you for not passing along to you all this stuff I've been getting here. In fact, I really wish I didn't have to have it myself. Get me?"

"Got you? I'm 'way ahead of you! Don't want it, nor any part of it—that's why I've stayed away from any chance of learning any of it, and the one reason why I am going back home instead of going with you. I have just brains enough to realize that neither I nor any other man of my race should have it. By the time we grow up to it naturally we shall be able to handle it, but not until then."

The two brain brothers grasped hands strongly, and Dunark continued in a lighter vein: "It takes all kinds of people to make a world, you know—and all kinds of races, except the Fenachrone, to make a Universe. With Mardonale gone, the evolution of Osnome shall progress rapidly, and while we may not reach the Ultimate Goal, I have learned enough from you already to speed up our progress considerably."

"Well, that's that. Had to get it off my chest, although I knew you'd get the idea all right. Here are the girls—Sitar too. We'll show 'em around."

SEATON'S first thought was for the very brain of the ship—the precious lens of neutronium in its thin envelope of the eternal jewel—without which the beam of fifth-order rays could not be directed. He found it a quarter of a mile back from the needle-sharp prow, exactly in the longitudinal axis of the hull, protected from any possible damage by bulkhead after massive bulkhead of impregnable inoson. Satisfied upon that point, he went in search of the others, who were exploring their vast new space-ship.

Huge as she was, there was no waste space—her design was as compact as that of a fine radio set. The living quarters were grouped closely about the central compartment, which housed the power plants, the many ray generators and projectors, and the myriads of controls of the marvelous mechanism for the projection and direction of fifth-order rays. Several large compartments were devoted to the machinery which automatically serviced the vessel—refrigerators, heaters, generators and purifiers for water and air, and the numberless other mechanisms which would make of the cruiser a comfortable and secure home, as well as an invincible battleship, in the heatless, lightless, airless, matterless waste of illimitable, inter-galactic space. Many compartments were for the storage of food-supplies, and these were even then being filled by forces under the able direction of the First of Chemistry.

"All the comforts of home, even to the labels," Seaton grinned, as he read "Dole No. 1" upon cans of pineapple which had never been within thousands of light-years of the Hawaiian Islands, and saw quarter after quarter of fresh meat going into the freezer room from a planet upon which no animal other than man had existed for many thousands of years. Nearly all of the remaining millions of cubic feet of space were for the storage of uranium for power, a few rooms already having been filled with ingot inoson for repairs. Between the many bulkheads that divided the ship into numberless airtight sections, and between the many concentric skins of purple metal that rendered the vessel space-worthy and sound, even though slabs many feet thick were to be shorn off in any direction—in every nook and cranny could be stored the metal to keep those voracious generators full-fed, no matter how long or how severe the demand for power. Every room was connected through a series of tubular tunnels, along which force-propelled cars or elevators slid smoothly—tubes whose walls fell together into air-tight seals at any point, in case of a rupture.

As they made their way back to the great control-

room of the vessel, they saw something that because of its small size and clear transparency they had not previously seen. Below that room, not too near the outer skin, in a specially-built spherical launching space, there was *Skylark Two,* completely equipped and ready for an interstellar journey on her own account!

"Why, hello, little stranger!" Margaret called. "Rovol, that was a kind thought on your part. Home wouldn't quite be home without our old *Skylark,* would it, Martin?"

"A practical thought, as well as a kind one," Crane responded. "We undoubtedly will have occasion to visit places altogether too small for the really enormous bulk of this vessel."

"Yes, and whoever heard of a sea-going ship without a small boat?" put in irrepressible Dorothy. "She's just too perfectly kippy for words, sitting up there, isn't she?"

CHAPTER XV

The Extra-Galactic Duel

LOADED until her outer skin almost bulged with tightly packed bars of uranium and equipped to meet any emergency of which the combined efforts of the mightiest intellects of Norlamin could foresee even the slightest possibility, *Skylark Three* lay quiescent. Quiescent, but surcharged with power, she seemed to Seaton's tense mind to share his own eagerness to be off; seemed to be motionlessly straining at her neutral controls in a futile endeavor to leave that unnatural and unpleasant environment of atmosphere and of material substance, to soar outward into absolute zero of temperature and pressure, into the pure and undefiled ether which was her natural and familiar medium.

The five human beings were grouped near an open door of their cruiser; before them were the ancient scientists, who for so many days had been laboring with them in their attempt to crush the monstrous race which was threatening the Universe. With the elders were the Terrestrials' many friends from the Country of Youth, and surrounding the immense vessel in a throng covering an area to be measured only in square miles were massed myriads of Norlaminians. From their tasks everywhere had come the mental laborers; the Country of Youth had been left depopulated; even those who, their lifework done, had betaken themselves to the placid Nirvana of the Country of Age, returned briefly to the Country of Study to speed upon its way that stupendous Ship of Peace.

The majestic Fodan, Chief of the Five, was concluding his address:

"And may the Unknowable Force direct your minor forces to a successful conclusion of your task. If, upon the other hand, it should by some unforeseen chance be graven upon the Sphere that you are to pass in this supreme venture, you may pass in all tranquillity, for the massed intellect of our entire race is here supporting me in my solemn affirmation that the Fenachrone shall not be allowed to prevail. In the name of all Norlamin, I bid you farewell."

Crane spoke briefly in reply and the little group of Earthly wanderers stepped into the elevator. As they sped upward toward the control room, door after door shot into place behind them, establishing a manifold seal. Seaton's hand played over the controls and the great cruiser of the void tilted slowly upward until its narrow prow pointed almost directly into the zenith. Then, very slowly at first, the unimaginable mass of the vessel floated lightly upward, with a slowly increasing velocity. Faster and faster she flew—out beyond measurable atmosphere, out beyond the outermost limits of the green system. Finally, in interstellar space, Seaton threw out super-powered detector and repelling screens, anchored himself at the driving console with a force, set the power control at "molecular" so that the propulsive force affected alike every molecule of the vessel and its contents, and, all sense of weight and acceleration lost, he threw in the plunger switch which released every iota of the theoretically possible power of the driving mass of uranium.

Staring intently into the visiplate, he corrected their course from time to time by minute fractions of a second of arc; then, satisfied at last, he set the automatic forces which would guide them, temporarily out of their course, around any obstacles, such as the uncounted thousands of solar systems lying in or near their path. He then removed the restraining forces from his body and legs, and with a small pencil of force wafted himself over to Crane and the two women.

"Well, bunch," he stated, matter-of-fact, "we're on our way. We'll be this way for some time, so we might as well get used to it. Any little thing you want to talk over?"

"How long will it take us to catch 'em?" asked Dorothy. "Traveling this way isn't half as much fun as it is when you let us have some weight to hold us down."

"Hard to tell exactly, Dottie. If we had precisely four times their acceleration and had started from the same place, we would of course overtake them in just the number of days they had the start of us, since the distance covered at any constant positive acceleration is proportional to the square of the time elapsed. However, there are several complicating factors in the actual situation. We started out not only twenty-nine days behind them, but also a matter of five hundred thousand light-years of distance. It will take us quite a while to get to their starting-point. I can't tell even that very close, as we will probably have to reduce this acceleration before we get out of the Galaxy, in order to give our detectors and repellers time to act on stars and other loose impediments. Powerful as those screens are and fast as they work, there is a limit to the velocity we can use here in this crowded Galaxy. Outside it, in free space, of course we can open her up again. Then, too, our acceleration is not exactly four times theirs, only three point nine one eight six. On the other hand, we don't have to catch them to go to work on them. We can operate very nicely at five thousand light-centuries. So there you are—it'll probably be somewhere between thirty-nine and forty-one days, but it may be a day or so more or less."

"How do you know they are using copper?" asked Margaret. "Maybe their scientists stored up some uranium and know how to use it."

"Nope, that's out like a light. First, Mart and I saw only copper bars in their ship. Second, copper is the most efficient metal found in quantity upon their planet. Third, even if they had uranium or any metal of its class, they couldn't use it without a complete knowledge of, and ability to handle, the fourth and fifth orders of rays."

"It is your opinion, then, that destroying this last Fenachrone vessel is to prove as simple a matter as did the destruction of the others?" Crane queried, pointedly.

"Hm—m—m. Never thought about it from that angle at all, Mart. . . . You're still the ground-and-lofty thinker of the outfit, ain't you? Now that you mention it, though, we may find that the Last of the Mohicans ain't entirely toothless, at that. But say, Mart, how come I'm as wild and cock-eyed as I ever was? Rovol's a slow and thoughtful old codger, and with his accumulation of knowledge it looks like I'd be the same way."

"Far from it," Crane replied. "Your nature and mine remain unchanged. Temperament is a basic trait of heredity, and is neither affected nor acquired by increase of knowledge. You acquired knowledge from Rovol, Drasnik, and others, as did I—but you are still the flashing genius and I am still your balance wheel. As for Fenachrone toothlessness: now that you have considered it, what is your opinion?"

"Hard to say. They didn't know how to control the fifth order rays, or they wouldn't have run. They've got real brains, though, and they'll have something like seventy days to work on the problem. While it doesn't stand to reason that they could find out much in seventy days, still they may have had a set-up of instruments on their detectors that would have enabled them to analyze our fields and thus compute the structure of the secondary projector we used there. If so, it wouldn't take them long to find out enough to give us plenty of grief—but I don't really believe that they knew enough. I don't quite know what to think. They may be easy and they may not; but, easy or hard to get, we're loaded for bear and I'm plenty sure that we'll pull their corks."

"So am I, really, but we must consider every contingency. We know that they had at least a detector of fifth-order rays . . ."

"And if they did have an analytical detector," Seaton interrupted, "they'll probably slap a ray on us as soon as we stick our nose out of the Galaxy!"

"They may—and even though I do not believe that there is any probability of them actually doing it, it will be well to be armed against the possibility."

"Right, old top—we'll do that little thing!"

UNEVENTFUL days passed, and true to Seaton's calculations, the awful acceleration with which they had started out could not be maintained. A few days before the edge of the Galaxy was reached, it became necessary to cut off the molecular drive, and to proceed with an acceleration equal only to that of gravitation at the surface of the Earth. Tired of weightlessness and its attendant discomforts to everyday life, the travelers enjoyed the interlude immensely, but it was all too short—too soon the stars thinned out ahead of *"Three's"* needle prow. As soon as the way ahead of them was clear, Seaton again put on the maximum power of his terrific bars and, held securely at the console, set up a long and involved integral. Ready to transfer the blended and assembled forces to a plunger, he stayed his hand, thought a moment, and turned to Crane.

"Want some advice, Mart. I'd thought of setting up three or four courses of five-ply screen on the board—a detector screen on the outside of each course, next to it a repeller, then a full-coverage ether-ray screen, then a zone of force, and a full-coverage fifth-order ray-screen as a liner. Then, with them all set up on the board, but not out, throw out a wide detector. That detector would react upon the board at impact with anything hostile, and automatically throw out the courses it found necessary."

"That sounds like ample protection, but I am not enough of a ray-specialist to pass an opinion. Upon what point are you doubtful?"

"About leaving them on the board. The only trouble is that the reaction isn't absolutely instantaneous. Even fifth-order rays would require a millionth of a second or so to set the courses. Now if they were using ether waves, that would be lots of time to block them, but if they *should* happen to have fifth-order stuff it'd get here the same time our own detector-impulse would, and it's just barely conceivable that they might give us a nasty jolt before the defenses went out. Nope, I'm developing a cautious streak myself now, when I take time to do it. We've got lots of uranium, and I'm going to put one course out."

"You cannot put everything out, can you?"

"Not quite, but pretty nearly. I'll leave a hole in the ether screen to pass visible light—no, I won't either. You folks can see just as well, even on the direct-vision wall plates, with light heterodyned on the fifth, so we'll close all ether bands, absolutely. All we'll have to leave open will be the one extremely narrow band upon which our projector is operating, and I'll protect that with a detector screen. Also, I'm going to send out all four courses, instead of only one—then I'll *know* we're all right."

"Suppose they find our one band, narrow as it is? Of course, if that were shut off automatically by the detector, we'd be safe; but would we not be out of control?"

"Not necessarily—I see you didn't get quite all this stuff over the educator. The other projector worked that way, on one fixed band out of the nine thousand odd possible. But this one is an ultra-projector, an improvement invented at the last minute. Its carrier wave can be shifted at will from one band of the fifth order to any other one; and I'll bet a hat that's *one* thing the Fenachrone haven't got! Any other suggestions? . . . all right, let's get busy!"

A single light, quick-acting detector was sent out ahead of four courses of five-ply screen, then Seaton's fingers again played over the keys, fabricating a detector screen so tenuous that it would react to nothing weaker than a copper power bar in full operation and with so nearly absolute zero resistance that it could be driven at the full velocity of his ultra-projector. Then, while Crane watched the instruments closely and while Dorothy and Margaret watched the faces of their husbands with only mild interest, Seaton drove home the plunger that sent that prodigious and ever-widening fan ahead of them with a velocity unthinkable millions of times that of light. For five minutes, until that far-flung screen had gone as far as it could be thrown by the utmost power of the uranium bar, the two men stared at the unresponsive instruments, then Seaton shrugged his shoulders.

"I had a hunch," he remarked with a grin. "They didn't wait for us a second. 'I don't care for some,' says they, 'I've already had any.' They're running in a straight line, with full power on, and don't intend to stop or slow down."

"How do you know?" asked Dorothy. "By the distance? How far away are they?"

"I know, Red-Top, by what I didn't find out with that screen I just put out. It didn't reach them, and it went so far that the distance is absolutely meaningless, even expressed in parsecs. Well, a stern chase is proverbially a long chase, and I guess this one isn't going to be any exception."

EVERY eight hours Seaton launched his all-embracing ultra-detector, but day after day passed and the instruments remained motionless after each cast of that gigantic net. For several days the Galaxy behind them had been dwindling from a mass of stars down to a huge bright lens; down to a small, faint lens; down to a faintly luminous patch. At the previous cast of the detector it had still been visible as a barely-perceptible point of light in the highest telescopic power of the visiplate. Now, as Dorothy and Seaton, alone in the control room, stared into that visiplate, everything was blank and black: sheer, indescribable blackness; the utter and absolute absence of everything visible or tangible.

"This is awful, Dick. . . . It's just too darn horrible. It simply scares me pea-green!" she shuddered as she drew herself to him, and he swept both his mighty arms around her in a soul-satisfying embrace.

"'Sall right, darling. That stuff out there'd scare anybody—I'm scared purple myself. It isn't in any finite mind to understand anything infinite or absolute. There's one redeeming feature, though, cuddle-pup—we're together."

"You chirped it, lover!" Dorothy returned his caresses with all her old-time fervor and enthusiasm. "I feel lots better now. If it gets to you that way, too, I know it's perfectly normal—I was beginning to think maybe I was yellow or something . . . but maybe you're kidding me?" she held him off at arm's length, looking deep into his eyes: then, reassured, went back into his arms. "Nope, you feel it, too," and her glorious auburn head found its natural resting-place in the curve of his mighty shoulder.

"Yellow! . . . You?" Seaton pressed his wife closer still and laughed aloud. "Maybe—but so is picric acid; so is nitroglycerin; and so is pure gold."

"Flatterer!" Her low, entrancing chuckle bubbled over. "But you know I just revel in it. I'll kiss you for that!"

"It *is* awfully lonesome out here, without even a star to look at," she went on, after a time, then laughed again. "If the Cranes and Shiro weren't along, we'd be really 'alone at last,' wouldn't we?"

"I'll say we would! But that reminds me of something. According to my figures, we might have been able to detect the Fenachrone on the last test, but we didn't. Think I'll try 'em again before we turn in."

Once more he flung out that tenuous net of force, and as it reached the extreme limit of its travel, the needle of the micro-ammeter flickered slightly, barely moving off its zero mark.

"Whee! Whoopee!" he yelled. "Mart, we're on 'em!"

"Close?" demanded Crane, hurrying into the control room upon his beam.

"Anything but. Barely touched 'em—current something less than a thousandth of a micro-ampere on a million to one step-up. However, it proves our ideas are O. K."

The next day—*Skylark III* was running on Eastern Standard Time, of the Terrestrial United States of America—the two mathematicians covered sheet after sheet of paper with computations and curves. After checking and rechecking the figures, Seaton shut off the power, released the molecular drive, and applied an acceleration of twenty-nine point six oh two feet per second; and five human beings breathed as one a profound sigh of relief as an almost-normal force of gravitation was restored to them.

"Why the let-up?" asked Dorothy. "They're an awful long ways off yet, aren't they? Why not hurry up and catch them?"

"Because we're going infinitely faster than they are now. If we kept up full acceleration, we'd pass them so fast that we couldn't fight them at all. This way, we'll still be going a lot faster than they are when we get close to them, but not enough faster to keep us from maneuvering relatively to their vessel, if things should go that far. Guess I'll take another reading on 'em."

"I do not believe that I should," Crane suggested, thoughtfully. "After all, they may have perfected their instruments, and yet may not have detected that extremely light touch of our ray last night. If so, why put them on guard?"

"They're probably on guard, all right, without having to be put there—but it's a sound idea, anyway. Along the same line I'll release the fifth-order screens, with the fastest possible detector on guard. We're just about within reach of a light copper-driven ray right now, but it's a cinch they can't send anything heavy this far, and if they think we're overconfident, so much the better."

"There," he continued, after a few minutes at the keyboard. "All set. If they put a detector on us, I've got a force set to make a noise like a New York City fire siren. If pressed, I'd reluctantly admit that in my opinion we're carrying caution to a point ten thousand degrees below the absolute zero of sanity. I'll bet my shirt that we don't hear a yip out of them before we touch 'em off. Furthermore. . . ."

THE rest of his sentence was lost in a crescendo bellow of sound. Seaton, still at the controls, shut off the noise, studied his meters carefully, and turned around to Crane with a grin.

"You win the shirt, Mart. I'll give it to you next Wednesday, when my other one comes back from the laundry. It's a fifth-order detector ray, coming in beautifully on band forty-seven fifty, right in the middle of the order."

"Aren't you going to put a ray on 'em?" asked Dorothy in surprise.

"Nope—what's the use? I can read theirs as well as I could one of my own. Maybe they know that, too—if they don't we'll let 'em think we're coming along, as innocent as Mary's little lamb, so I'll let their ray stay on us. It's too thin to carry anything, and if they thicken it up much I've got an axe set to chop it off." Seaton whistled a merry lilting refrain as his fingers played over the stops and keys.

"Why, Dick, you seem actually pleased about it," Margaret was plainly ill at ease.

"Sure am. I never did like to drown baby kittens, and it kinda goes against the grain to stab a guy in the back, when he ain't even looking, even if he is a Fena-

chrone. If they can fight back some I'll get mad enough to blow 'em up happy."

"But suppose they fight back too hard?"

"They can't—the worst that can possibly happen is that we can't lick them. They certainly can't lick us, because we can outrun 'em. If we can't get 'em alone, we'll beat it back to Norlamin and bring up re-enforcements."

"I am not so sure," Crane spoke slowly. "There is, I believe, a theoretical possibility that sixth-order rays exist. Would an extension of the methods of detection of fifth-order rays reveal them?"

"*Sixth?* Sweet spirits of niter! Nobody knows anything about them. However, I've had one surprise already, so maybe your suggestion isn't as crazy as it sounds. We've got three or four days yet before either side can send anything except on the sixth, so I'll find out what I can do."

He flew at the task, and for the next three days could hardly be torn from it for rest; but

"O. K., Mart," he finally announced. "They exist, all right, and I can detect 'em. Look here," and he pointed to a tiny receiver, upon which a small lamp flared in brilliant scarlet light.

"Are they sending them?"

"No, fortunately. They're coming from our bar. See, it shines blue when I put a grounded shield between it and the bar, and stays blue when I attach it to their detector ray."

"Can you direct them?"

"Not a chance in the world. That means a lifetime, probably many lifetimes, of research, unless somebody uses a fairly complete pattern of them close enough to this detector so that I can analyze it. 'Sa good deal like calculus in that respect. It took thousands of years to get it in the first place, but it's easy when somebody that already knows it shows you how it goes."

"The Fenachrone learned to direct fifth-order rays so quickly, then, by an analysis of our fifth-order projector there?"

"Our secondary projector, yes. They must have had some neutronium in stock, too—but it would have been funny if they hadn't, at that—they've had intra-atomic power for ages."

Silent and grim, he seated himself at the console, and for an hour he wove an intricate pattern of forces upon the inexhaustible supply of keys afforded by the ultra-projector before he once touched a plunger.

"What are you doing? I followed you for a few hundred steps, but could go no farther."

"Merely a little safety-first stuff. In case they should send any real pattern of sixth-order rays this set-up will analyze it, record the complete analysis, throw out a screen against every frequency of the pattern, throw on the molecular drive, and pull us back toward the galaxy at full acceleration, while switching the frequency of our carrier wave a thousand times a second, to keep them from shooting a hot one through our open band. It'll do it all in about a millionth of a second, too—I want to get us all back alive if possible! Hm—m. They've shut off their ray—they know we've tapped onto it. Well, war's declared now—we'll see what we can see."

Transferring the assembled beam to a plunger, he sent out a secondary projector toward the Fenachrone vessel, as fast as it could be driven, close behind a widespread detector net. He soon found the enemy cruiser, but so immense was the distance that it was impossible to hold the projection anywhere in its neighborhood. They flashed beyond it and through it and upon all sides of it, but the utmost delicacy of the controls would not permit of holding even upon the immense bulk of the vessel, to say nothing of holding upon such a relatively tiny object as the power bar. As they flashed repeatedly through the warship, they saw piecemeal and sketchily her formidable armament and the hundreds of men of her crew, each man at battle station at the controls of some frightful engine of destruction. Suddenly they were cut off as a screen closed behind them—the Earth-men felt an instant of unreasoning terror as it seemed that one-half of their peculiar dual personalities vanished utterly. Seaton laughed.

"That was a funny sensation, wasn't it? It just means that they've climbed a tree and pulled the tree up after them."

"I do not like the odds, Dick," Crane's face was grave. "They have many hundreds of men, all trained; and we are only two. Yes, only one, for I count for nothing at those controls."

"All the better, Mart. This board more than makes up the difference. They've got a lot of stuff, of course, but they haven't got anything like this control system. Their captain's got to issue orders, whereas I've got everything right under my hands. Not so uneven as they think!"

WITHIN battle range at last, Seaton hurled his utmost concentration of direct forces, under the impact of which three courses of Fenachrone defensive screen flared through the ultra-violet and went black. There the massed direct attack was stopped—at what cost the enemy alone knew—and the Fenachrone countered instantly and in a manner totally unexpected. Through the narrow slit in the fifth-order screen through which Seaton was operating, in the bare one-thousandth of a second that it was open, so exactly synchronized and timed that the screens did not even glow as it went through the narrow opening, a gigantic beam of heterodyned force struck full upon the bow of the *Skylark*, near the sharply-pointed prow, and the stubborn metal instantly flared blinding white and exploded outward in puffs of incandescent gas under the awful power of that Titanic thrust. Through four successive skins of inoson, the theoretical ultimate of possible strength, toughness, and resistance, that frightful beam drove before the automatically-reacting detector closed the slit and the impregnable defensive screens, driven by their mighty uranium bars, flared into incandescent defense. Driven as they were, they held, and the Fenachrone, finding that particular attack useless, shut off their power.

"Wow! They sure have got something!" Seaton exclaimed in unfeigned admiration. "They sure gave us a solid kick that time! We will now take time out for repairs. Also, I'm going to cut our slit down to a width of one kilocycle, if I can possibly figure out a way of working on that narrow a band, and I'm going to step up our shifting speed to a hundred thousand. It's a good thing they built this ship of ours in a lot of layers—if that'd go through the interior we would have been punctured for fair. You might weld up those holes, Mart, while I see what I can do here."

Then Seaton noticed the women, white and trembling, upon a seat.

(*Continued on page 657*)

Illustrated by MOREY

Looking back, I saw the Professor suddenly fall backwards into the rising waters. . . .

I AM a torn man now. It is with bare strength that I write this. But write I must. I must put it into words, so that the world will get it before I die. And I feel that I may die at any moment, the pain is so intense. But I am afraid the world will not be able to do anything—I am afraid it is too late to make use of what I discovered.

I don't know how long I have been gone from civilization. My mind had but lately cleared itself; my sense of time is gone; I don't know how long that blank period of mine existed. At this moment of writing I feel that the Supreme Being lifted the veil from my mental unconsciousness long enough for me to put

The Dynasty of the Blue-Black Rays

By Milton R. Peril

THE truth, it is said, is often stranger than fiction. It is not surprising, therefore, that the most amazing fiction is often based on truth. Even legends and myths generally have a basis in fact. Many strange and interesting legends are told about the old Incas of the Peruvian country, entitled to be termed a civilized race. What happened to those old Incas, for instance; how they disappeared and how they were lost to the world, is still merely a matter of conjecture—interesting conjecture, of course—and ethnologists have built many and various theories to account for their complete disappearance. It is a fascinating subject, and our new author has woven it into an absorbing tale.

Do not fail to read this excellent story.

down the entire happenings, the truth as I saw it, before I go forth from this earth.

My name is Doctor Henrich von Grossbach. You will perhaps recognize it. I was the greatest scientific student on the continent, head of the department of science in the largest university in Germany. My word in such matters always carried weight. It was never known to deviate from the path of fact and honesty. I mention this because I want to implant in you the feeling that you are reading the truth, and not the ravings of, perhaps, a distorted, fantastic mind. As I lie now, tossing from side to side, writing between spasms of terrible pain, but writing, I can groan in dismay to think that people might take this as the froth of a highly imaginative brain. If you ever believed anything in your life, believe me!

Scientists don't write fairy tales, let alone believe them. It takes the severest of trials to make them accept the most novel of ideas. And I, at the time of my active presence on the continent, was one of the hardest to convince. I was a true-bred scientist in that respect. Many men living—I presume that they still live—will vouch for the fact that Doctor Grossbach was hard to satisfy, but once convinced, was not a skeptic; that much of my reputation I can assert here without unduly heaping praise on myself. I want to convince you, to take away your skepticism.

Read this and believe it—though it will sound ridiculous beyond measure. One of the severest scientists of the world lived through it. . . .

TO begin with, I must explain that I was at one time the greatest living exponent of Peruvian history. I had spent years in the wilds of Peru ever searching—uncovering new lines of that civilized people, the Incas. Peru and the Incas were my hobby. The study of those tribes was something I liked immensely, something that was not an effort, but a pleasure.

Thus it was that one day during the summer I left Germany for Peru. I had a visitor. I had heard of him often, but, strange to say, I had never come in contact with him. It was more than strange, seeing that that person was one of the most inveterate of the Inca delvers, and inasmuch as I occupied a high pedestal along that line, we had never been thrown together. It was the celebrated American scientist, Professor Crowders.

He was announced in my home about a week before I intended to leave. All of my important paraphernalia had been sent forth the week before, and I was simply resting up for what I knew would be a strenuous but pleasant journey.

He proved to be a large man, with a short stubble of a beard. His massive shoulders, affixed atop his great body, was a fine base for that splendid head, its finely chiseled features and the luxuriant growth of flowing dark hair. I was impressed.

His trip had been made in order to see me.

"You are, I hear, off to Peru within a week?" asked the American, seated in the large library of my home.

I nodded.

"Then it is fortunate I decided to see you now," he said, his sparkling teeth gleaming. "I have long intended to visit you, but I am indeed successful in approaching you on the eve of your departure."

"What is it?" I inquired. His manner was not the empty sort; his very nature showed that he did nothing without weighing all consequences, and that his words

were incrusted with much logic. I had that feeling from the start.

"You are headed this time, I think, for the southeastern part of Huanuco Junin?"

My itinerary was not unknown. "Yes," I answered.

"I presume that you have heard of the native talk and belief in that section—of the heavenly ascendance of the half-brother Tenta Raci and his followers?" he asked.

I had. That gaping hole in the history of Peru had never been filled to any extent. For years I had been enthused with the hope of finding something in connection with the lost race, but the enthusiasm had finally died for lack of discoveries. Many times I had listened to the natives offering up a prayer to Tenta Raci and his band; those simple folk believed that they had been taken skyward in a vast flame, and that they now reposed next to the Ruler, protecting their descendants.

Tenta Raci had been the half-brother of the first Inca ruler, Manco Capac. His religion had been almost a part of himself, and he had so convinced his followers of the near-by presence of the Ruler and his flame that they had followed him without a word. The fact that not a single vestige belonging to the lost people had ever been found, substantiated the belief of the ensuing generations that their ancestor had succeeded in reaching the kingdom of the Sun, an everlasting place.

Every time I had traveled to the southeast of the great mountain range, Huanuco Junin, I could not escape the atmosphere of superstition that pervaded the people living there. Much as I had believed in the existence of a Tenta Raci years before, when I was but a young man, the sight of those worshiping natives of the present day made me look upon that half-brother as a sort of legendary character. Of course, history had made a place for the half-brother of Manco Capac; he had lived. But this fanatic worship I looked upon as the outgrowth of a hazy legend of an enchanted rise to glory.

"We know that Tenta Raci lived," said the American. "But we took no stock in that heavenly ascendance. Am I right, Doctor?"

"Yes."

"And we have found but little of what happened to that band?"

Again I acquiesced.

The American gazed at me squarely. "I disregarded it also. But last year I was down there. I went through that malaria-infested territory which is deep in the heart of the Huanuco Junin. That district that you went through once, if you remember. What happened made me change my mind!"

"In what way?" questioned I.

"When you were there," Professor Crowders asked me eagerly, "did you touch that last hill in the chain?"

I remembered that last hill clearly, as it stood before me, unscalable. "I surely did. But I didn't get anywhere. That is the one that presented no path. It was a home for winged animals only!"

"Birds, yes!" laughed Crowders. "You are hereby honored by gazing at the living bird! I have already been up there!"

My interest quickened. I plied the man with many questions, and he revealed that he had stumbled upon a covered trail that weaved its way up the precipitous side of the hill. I was surprised. That hill had taken a solid week of my time once, and I had not been able to find any means of ascending it.

After explaining how he had found the opening leading upward, the American continued:

"I had gone about five hundred feet on the path with my native guide. Together we had been able to manage the steep ascent. We had just rested on a level ledge when my native uttered a cry and pointed to the side, near a small outcropping. There, sitting against a boulder, rather reclining under one, because it extended out about two feet and acted as a natural roof, was a skeleton. Of course I ran immediately to the spot, and let me tell you that running there was inviting death. I knelt down. At my touch the skeleton fell apart.

"I bridled my enthusiasm. The disintegration checked me. A skeleton could not possess such a shape and fall apart like that unless it were unbelievably old.

IMAGINE my surprise when the clothing worn by that figure, in its fadedness, proved to be of old design and cut. I took a piece of the garment between my fingers and it shriveled up into fine powder. Through some uncanny natural force that skeleton had reposed under that ice and the climate had not succeeded in completely ravaging it. The outline was still there, undispelled. Countless thoughts were beginning to leap through my mind. But I did what no real scientist would do!"

I asked him what. I was extremely interested.

"I took my guide and went away from there, back down the trail. I had intended to leave the vicinity before, because we had long overstayed our supply limit. The men were on the verge of leaving me. I had induced them to stay an extra day when the guide had shown me that path. But now that I had discovered that emaciated and dust-like figure, I left, for fear that a lengthy stay would force me to remain to delve deeper into the mystery of the hill, and I would be left without food or man.

"I knew that leaving that skeleton there would not be harming it, for if it could have endured the ages without intervention, it would not be trifled with until I got back. And I intended to return as soon as I could replenish supplies and get a new hold on the natives. The guide committed me to strict silence regarding the approach of the hill, if that meant anything.

"I went back. Misfortune descended suddenly. The guide got too close to one of those mustangs; it lashed out with its rear hoofs and caught him squarely in the face. His own mother wouldn't have recognized him then. We buried him near.

"That was the first disagreeable blow. It seemed that Fate had decided I should lay off for a while. By the time we got back to the first village the swift stream had taken half of my four-legged animals and the equipment. The natives grew dark and moody, and attributed all to my injudicious decision of remaining longer than necessary.

"When I finally got to the village on the tributary that empties into the Ucayali, I was laid up with the fever. I do not remember anything during that relapse. I must have been there weeks. If it were not for the hospitable natives, I would not have pulled through.

"When I recuperated, that shriveling figure of the Inca occupied most of my thoughts. It slowly but gently grew upon me that those faint designs were

worn during the reign of Manco Capac. It became an obsession with me. I could have laid my life down for its conviction.

"I know now that I must have had a subconscious thought always within me about the lost race. Of course there was no association of that with the figure, but it hastened my desire for action. I was ready to go back; waxed impatient. I felt that I was on the brink of a colossal disclosure.

"But I never got started. The natives wouldn't listen to me. I couldn't get any supplies. And then I realized I needed a long recuperation most of all. So I went back to my own country."

Skeptical as I was, Crowders had me on the edge of the seat. I felt that he was telling me the truth without elaboration, that his beliefs were plausible.

"You know," I told him, "some native could have found his way up that hill during the past century."

"True," replied the American; "but no human body, I'll swear, would crumble to dust as did that one, in one century. And those designs——"

He rambled on, but it didn't take him long to win me over to his point of view. Perhaps it was because it was something that would rejuvenate my exploring blood—now that I knew I was going there. I felt as the Professor did—on the verge of a tremendous discovery. With this novel revelation I was like an explorer on his first jaunt. I made arrangements with him to sail with me. He had already prepared himself, it appeared. He had prophesied his going with me on the strength of his argument. I was very glad of that. He would be a splendid man on the trip, and together we could overcome all obstacles.

We sailed from Marseilles on board a French ship headed for South America. The voyage was uneventful. We crossed the Atlantic, buffeted one mild storm, glided into the Caribbean, were hauled through the Isthmus and then dropped down the west coasts of Colombia and Ecuador, finally steaming into the port in Peru. Callao was always the first of my stops in the country and I knew the fair-sized city well.

Here I found my paraphernalia and supplies of bulk stored away as per my directions; and I immediately got in touch with my native, Tunja, who had been the guide on previous expeditions. He was overjoyed to see me, as I was to see him. He promised quick muster of the required natives who would accompany us, and I knew I could depend upon him to secure the best for the least outlay. Tunja would enhance any expedition.

We traveled overland, the pack-animals struggling with their loads. Crowders and I were the only white men. Many days of stifling heat we had, days which would ordinarily have discouraged anybody, but our enthusiasm was too great.

We entered that malaria-infested district. After leaving the village where the American had been ill, he took charge of the direction, and we ploughed through the Huanuco Junin, breaking brush at some points, striking faint paths at others. Our supply animals followed faithfully through every hardship, with the strapped burdens loading them down. They were used to this.

Our objective lay in a terrifying section of the Huanuco Junin, along a diminishing chain of mountainous hills—a glade that receded from the edge of the forest about a hundred yards, ending up against a high hill whose sides were so precipitous that it appeared as if nothing could grasp hold thereon. Brush and occasional small trees cropped out of its sides, like intermittent growth of hair on bald spots.

At last we selected a choice spot in the clearing under the haughty cliffs and pitched our tents. The animals were loosened to browse in the grass; surrounded by impassable timber, the clearing would keep them harnessed to the green vegetation that sprouted plentifully and which they soon began to munch contentedly. A slow, winding stream crept along the southern rim of the steep hill, an infested water, which lazily pried its sight into the thick mysteries of this region, and finally gained admission into the Ucayali. It looked as if a better nucleus for the expedition could not have been chosen.

When we finally had everything up, it was with nervous haste that Professor Crowders led me along the lazy stream at the southern end of the hill and up against a large clump of foliage at the turn of the river. It brushed against the walls of the steep hill, and, from a distance, I could swear that there would be no use in attempting to scale the heights from that vantage. But with an ax the American chopped down several young saplings and, with my assistance, rolled a large boulder to one side.

There, gashed in the rock, was an opening. It was about two feet wide and five feet high, extending like a tunnel in an upward direction. Crowders led the way carefully and I followed. For about fifty feet the path rose and then broke into the open. I looked around me and found that we were at a distance from the ground. From the surface below the thin trail on which we stood could not be seen.

So this had been the access that had remained obscure for ages! How could anyone down below have discerned that there was a thin path clinging to the side of the hill?

But our troubles had only begun. We weaved along so carefully that it seemed as if we were getting nowhere. The footing was precarious—one mis-step would tumble you straight down; there was little opportunity for hand-gripping the smooth walls.

Ordinarily we would have returned to the ground and prepared ourselves with appreciable tools for climbing, but the heat and fervor were too deeply imbedded in us, now that we were upon the scant trail, to make any delay by going back.

The natives had seen us depart, but they had not seen us upon the hill. It was fortunate in a way, I thought; I didn't want to rouse their superstitions—should they happen to think anything about this hill.

I followed on Crowders' heels—rather I crawled snail-fashion after him—and we went down a small incline and rounded a bend. I was pretty well fagged, but the American whispered to me that a few feet ahead was the spot where he had encountered the reposing and crumbling Indian, and my fatigue and soreness disappeared with a thought. I was on pins, and could I have risen and hastened to my objective by running, as the American had done the first time, I would have done so decidedly. But the worming leather boots of my partner just in front of me offset any haste on my part.

The trail at this point was a little wider, and we rose. With a majestic finger, the big American pointed to a ledge that receded from the narrow one we were on and I saw an overhanging rock. I slipped from the path to

the ledge and knelt at something that I could see lying under that protection.

OUR eyes did not deceive us; at least, mine didn't. I saw at a glance that I was dealing with a centuries' old problem and that the still visible texture of the garments was of old design. I fingered the leaning skeleton but could get no satisfactory grip on any portion of it, for it crumbled at the touch. Truly, it was a miracle how that body had survived the elements of nature.

"Our trip has not been in vain," said Crowders.

I kept staring. "No. Do you realize what this means?"

The Professor was looking up the side of the hill.

"This," said I, "is just the beginning of a deep problem. This figure had at some time or other come along this path, either alone or with a company. This trail must have been accessible at that time but was later hidden by the forces of nature. There are many questions that crop up now, the greatest of which is this design. You guessed right, Professor, when you recognized Manco Capac's period on that body. It is too fantastic to think that that man has lain here since the thirteenth century, but my eyes tell me that it is more probable than not. The general run of later designs in the ensuing generations did not have the orthodoxy that this faint but clear weave shows. The mere sight of this creature of the dust seems to transport me back through countless ages."

Professor Crowders nodded gravely.

"We will leave this as it is, Professor, and get back to our camp," I continued. "What we know now justifies our return to arm ourselves well. We have a big task ahead of us to get to the top of this hill; but I am sure that we are on the verge of a discovery. What came this way must have left its mark some place above, and we are here to find where. No use working our way to the top unprepared."

My mind was traveling at high speed. Usually in my gleanings of the Inca people I had been faced with excavations, with some mountain diggings. This, however, afforded a mysterious angle right at the start, and I could have staked my life that there was some interesting reason back of it all. And mystery brought to mind stories—plenty of them—stories about Tenta Raci, for instance.

Crowders and I reached the bottom after a hazardous and breath-taking descent. We went out of the cave-like opening and carefully fixed the bushes so that they would suggest no opening, and appear undisturbed.

Our natives had assembled our stuff with precision. They had not missed us, since we had been gone only a few hours. We set about preparing for the morrow. Dusk was in the offing.

The night turned out to be chilly and the natives made a large fire after we had partaken of food. Professor Crowders and I hedged around the hypnotic blaze and sought warmth and comfort. Tunja and his men were lounging in the background murmuring softly to each other; occasionally one would rise and toss a few branches upon the conflagration. The majestic glare seemed to induct each being into his trend of thought; the mystic radiations of the dark throbbed in us.

Crowders and I ventured rarely into spoken words, for somehow our tongues refused to deal with what lay on our minds. We, mutually, seemed to want to let our fancies do all the work of preparing a form and story to fit what we had already encountered. In a way it was better thus; talking ruins the depth of thought.

The natives were drifting off to their blankets one by one; they had had a severe day. It was no simple task for them to haul and force their way into this wild place. It brought the Professor and me into existing conditions and we broke from our thoughts and rose. I stretched my body and yawned. Tunja came up near us.

His form was stately for that of a native, his head thrown back.

"*Señores,*" said he, "pardon me for interrupting. Perhaps you can spare me a few moments before you retire?"

"Certainly," answered I, dropping another yawn. "A few moments more or less will not put the morning any further away or bring it any closer. What's on your mind, Tunja?"

He paused a moment. "You know this territory you are in now?"

My sleepiness peeled off like an outer skin. The American glanced up quickly. "What of it?" he asked.

The guide was abashed. "You know, Doctor," he said to me, "of the superstition relating to my forebears who dwelt in these parts long ago?"

"You mean Tenta Raci?"

He nodded, fidgety.

I laughed. "I am surprised at you, Tunja. An intelligent man like you still letting himself get hoodwinked by black fables of long ago."

But he was serious. His countenance bore a reverent air and he didn't smile.

"Doctor," he said softly to me, "I believe in that religious story that was handed down to me."

I wanted to scoff and reprimand him. But my mind had run in ancient channels for a while now, and I was interested in that half-brother, Tenta Raci. I wanted to draw from Tunja all that he knew.

"You have an imaginative mind, Tunja," I laughed lightly. "Tell us what is the matter."

"*Señores,*" started the guide awedly, "we are now on the ground which my forefathers trod. Their spirits walk about us now, I feel. Amongst our people the story of Tenta Raci is a legend we revere.

"I will not make it lengthy, *Señores,* for you need sleep. But years ago, as you know, the Inca people roamed over this domain. They were highly civilized. Legend tells that one Tenta Raci, the half-brother of the first Inca ruler, Manco Capac, led a gathering of worshipers up a mountain side to seek the god of life! *Señores,* my people worship Tenta Raci and his adherents. They believe that the god of life took them. My people pray to them for their life and happiness.

"*Señores,* this ground we sit on now is where the half-brother and his followers were swept up in a flame—at least, so tradition says. I have enough Inca blood in my veins to feel that the spirits of Manco Capac and his illustrious folk are living around me. I am ill at ease. I know my sleep will be disturbed with dreams of them. Our people avoid this district. The other natives are only restless now, but I am sure that they will break their bonds if they stay here long. So I had to tell you this."

We calmed Tunja. He went off to bed with the assurance that we did not intend to remain in that region long. I didn't know then whether I uttered a falsehood, because the work on the morrow might be short. But how far from the truth I came!

EARLY the next morning Crowders and I strapped a stout rope around our mid-bodies and filled our pockets with odds and ends, which we decided would be necessary for the day. We crammed a few bits of dried food into our pockets and carried a climbing pick each. With this equipment we hoped to combat the difficulties of the trail.

Tunja went along with us. We would need him. I knew. He opened his eyes widely when we broke away the brush and entered the cave-like formation. He set his face into a hardness, almost as if he wanted to drive away those suggestive thoughts that rose within him against his will power.

We connected the rope to Tunja and proceeded slowly along the narrow path, using the climbing pick with safe and sure hands. The going was not so severe as on the previous day and much breath was conserved.

It was a spectacle to observe Tunja's reception of the dust-like figure of the Inca. He had gone with me through many of my expeditions and had acquired a staple knowledge of his forebears. In all that time nothing had disturbed him; he was never imaginative when he worked.

But now Tunja was noticeably shocked, despite his cold, impassive face and take-it-all-as-it-comes mien. Distinctly do I remember thinking to myself that the reclining figure, judging by the guide's expression, was a key that was going to open and reveal something that would expand the mind. We went on.

From the broad ledge, for a distance of seventy-five feet, there was fair traveling and we didn't have to resort to a taut line and carefully placed picks. But the trail narrowed down to a hair's-breadth and some fifty feet from the top we hit sparse growths of old, gnarled vines protruding from the side of the hill just above the trail. Rather than making it easier, the extending branches imperiled the stepping. At one point the thin trail gave out completely; it appeared as if nature had prepared those wiry branches specifically for us. Without them it would have been a chance in a thousand to have scaled the space between the paths. We roped a stout branch and Tunja hoisted himself to it. He tested it and it responded with a faithful and reassuring touch before we permitted ourselves to crawl, aided by the guide's pull, to its protection. At that it took the combined strength of both the native and myself to pull the big American up the next stretch. We repeated this for a time until we saw ahead of us the resumption of the trail, which must have been earthed over by some ages-old landslide.

Once upon the trail again, and only a few feet from the top, which loomed above our heads, we went with caution. It wouldn't do to stumble now when we were so near our goal, and opportunities to fall presented themselves at every step. I seldom looked straight down, even though I was accustomed to mountain scaling; this hill had too strong an accent on its perpendicular line.

Tunja reached the top first and took a deep breath. Then he helped us clamber over the rim, and with hardly a glance at our surroundings, we fell to the ground, gasping for air. My heart was palpitating and thumping like a bass drum. Though I wanted to get up and look around, my physical condition wouldn't let me. Long draughts of the morning atmosphere worked spasmodically into my lungs.

Crowders kicked himself to his feet. At the movement I turned over on my side and gazed around.

The top of the hill was not level. It was almost completely overgrown with tropical vegetation, but the foliage and growth didn't obscure the contours of the depression as it gently wound its way downward in the middle, volcano-like. It might have been a crater once, but it looked too small. Nature must have modeled it, thought I, along those fiery fashions, without actually intending it to expel molten lava.

I looked down at the country below and saw our men and animals, midgets on a wide landscape. Far off were the other hills which formed this range. The early morning blue of the sky seemed close and the sun was just beginning to evince its power upon us; in no time would those heat rays penetrate and give us moments of sweltering discomfort.

We started down the depression, taking care as we slid along the decline. We came to a clearing in the center, a rocky place where growth could not take hold.

Tunja called our attention to it as soon as we came into the open. He pointed to an immense, rock-like formation that stood at the border of the clearing. It must have been about fifteen feet in height. What quickened my blood was the sight of the black pit that stared at us from within the rock. It was an entrance of some sort.

I ran to it and peered in. The sides didn't have the smoothness that comes from modeling by human hands and I saw that we had Nature to contend with once more. I stooped a little and went through. The Professor came after me, followed by Tunja.

The footing showed a slight grade downward. It grew intensely dark about fifty feet from the opening, and the Professor, who had fortunately included a torch among his effects, snapped it on.

We were slowly going down a natural tunnel that spread its walls farther and farther away as it developed. At a turn in the declining passage we stopped for a moment's talk; we decided to proceed with caution, as far as we could with safety.

We must have continued for about an hour along the passage, when I grew restless. The tunnel widened out to about ten feet and remained thus, without any devious channels. I could see Tunja's face shape up in the torch's beam, a set, long physiognomy.

"This is a strange descent, Crowders," I said, pausing. "Did you ever come across a cave with its passage so long and single?"

"It is peculiar," answered the Professor. "And we start right into this place like amateurs, without stoping to figure out anything. Why are we doing this? I'll tell you! The dust figure of the Inca is foremost on our minds!"

I nodded. We had rushed rather hastily into the dark; but we had been propelled by some sinister influence. That Inca must have been it. Tunja offered not a word.

We moved down the singular channel until we finally entered a large underground room. The American flashed the beam its full length. Treading around,

we looked for something in the nature of a find. Near the opposing wall we heard for the first time a purr, something like a gentle swish-swish—the far off noise of flowing water. Somewhere in the distance was an underground stream.

A consultation was held whether to return or continue our explorations. We were too far away from safety anyway should anything happen to us—no one knew whither we had gone. Our impulse was to advance; the memory of those hazardous and perilous paths over which we had passed prompted our decision; we didn't relish the idea of going back.

We weren't worried much. But there opened up on the side near the purring of the streamlet another entrance, that might be the beginning of a tunnel as endless as the one we had just quit. We didn't know how long we would have to be down here. We had to follow it, so of necessity the Professor directed his light into it and we went along the illuminated interior.

A short distance from the room my foot came in contact with a light metallic object and I picked it up. I discerned a rusty knife, an implement usually tucked in the belt. It had a carved handle that time had bested but which still revealed indications of a fine art. It was the first sign that we were hitting the right trail and that our efforts were not haphazard.

I WAS so excited that I almost shouted. This unnatural procession of ours certainly taxed our severest efforts, and what lay ahead of us was getting to be a source of anticipation that quickened my pulse. And this knife beckoned us on madly, for how could it have gotten underground in such a suggestive spot with a crumbling figure as an outpost on that trail? And the going was clear here. No diggings! But ahead! A passage down, down into the bowels of the earth, an unencumbered way, as if one were trudging downward to the domain of Lucifer himself.

As we progressed, the noise of the water grew louder and louder until it seemed that we were almost near a cataract. The passage narrowed down so that we had to go in single file. My hand brushed against the wall and I drew it back with a cry. The rock was hot.

I felt reluctant to proceed farther beside a boiling stream, but I knew that the water might actually be many feet away, with the rock between it and us. If that were the case, we could go ahead without fear of being boiled to death in case of sudden deluge; but in the dark it was very risky.

Professor Crowders was as anxious as I was to end up somewhere, so like true adventurers, we decided to continue the course, regardless of any danger.

We must have been several miles down when we got our first shock. During the entire descent we had not noticed it, partially because it was of weak strength and because our light was so evident. I called the Professor's attention to it for fear my eyesight had been deceived somewhat in the stygian blackness away from the torch.

Through the walls of the passage a dark ray seemed to be issuing, so dark that it appeared blacker than the original lightlessness. And there was a blue effect also. Crowders perceived the phenomenon. A faint suggestion of a coal-black ray emanated all around us: Tunja, the light of the torch thrown across his face, was an enigma; I didn't know whether he was going to revert to his ancient forebears and fall wildly upon his face or sink into a state of mental stupor.

I had no explanation for that dark radiation. Perhaps, thought I, some mineral rock of a new species exists here. Whatever it was, I felt that this was something vital to us. Tunja walked near me for some unaccountable reason.

As we went deeper, the black diffusion grew more noticeable; at times it had a faint tinge of blue in it. Aside from the slight decline in the path, it was not difficult progression. I had time to watch the steadily growing light as I walked. The black light, its beautiful velvet sheen glimmering, was getting blacker and blacker, and the blue, bluer and bluer!

For the first time we came to an intersection—a small tunnel that branched off the main one; it was a narrow, rocky entrance. Crowders immediately vetoed the advance through that opening, and we went straight ahead and downward, with the surge of the underground stream beside us always hissing in our ears.

The footing was not so favorable now. In places we slipped, rather than walked, down the smooth floor of the tunnel; something like cooled molten glass answered the soles of my boots. The black and blue gleam completely entered my body and, strangely, my head felt light, my legs unweary. At spots the gleam illuminated the surroundings, not enough to distinguish with full vision, but enough to make me feel that I was in another world. As a doctor of the sciences in the outer world, I was completely at a loss here. From all around me sprayed, as if from nowhere, that mystical, satiating ray.

I haven't the least idea how long we had traveled the downward path, but it must have been a long, long time. Not once were we attacked by any suggestions of hunger; the bits of food were still in our pockets untouched, and this, we found out later, had a definite meaning.

Tunja fell over something. When Crowders focused the light upon it we all let out a scream. Reposing against the wall was another one of those bodies that we had encountered out on the steep ascent. It was clothed in like garments. But what took our breaths away was that it was not decomposed, not aged dust like its mate, but a solid, resisting flesh!

I looked with wide eyes at my contemporary. My hands trembled as I knelt. I couldn't utter a word for a moment.

"Doctor," burst out a spasmodic Tunja, "l-let's go back."

I was attempting to collect my thoughts. I could see that the Professor was groping with himself, standing behind the native.

I silenced Tunja, reprimanding him for his weakness.

"Doctor," said the American to me, "no doubt you connect this body with that glow?"

I thought more of that emanation now; it must undoubtedly have had some influence on the body of the Indian, for I felt sure, on the knowledge of my Inca history, that this Inca had lived in the twelfth century. The dress was the design of that period; no other, later fabric had the markings of this raiment.

And this light, this ray! Something, an essence that did not exist in the world above, composed this radiation and kept a body, dead for centuries perhaps, in a more solid, lifelike form than any substance smeared

on the mummies of old; and this Indian looked far from a mummy. He looked almost as if he were capable of rising at any moment.

We inspected the body thoroughly. It was of the first Inca dynasty, without doubt. But I couldn't understand it. They hadn't lived in this vicinity in numbers enough to leave bodies strewn around like that.

I caught sight of Tunja's strained face. "There is nothing unnatural here," I upbraided him. "Why be so unnerved?"

He caught his breath. "It's my Indian blood, I guess, Doctor. This odd light is to me a premonition. I feel that we are on a precipice, ready to be thrown down!"

"Calm yourself," returned I. "We are on earth, even though we are far underneath the surface. There is a curious light here, but with a little reasoning everything can be explained." It was hard to talk to him thus when even I felt moved by the rays. But it was my purpose to pacify his nerves.

Crowders, in the pale light, had an impatient face—the countenance of a scientist on the verge of a discovery just beyond his reach. That the end of a disclosure was near seemed evident in the atmosphere.

"Let us continue," said the Professor eagerly. "This trail seems to have been made for a real mystery. Straight ahead it leads us; no breaks of any serious nature, with a little seasoning scattered here and there. I'm in favor of hounding this mystery to its lair."

He set off with the torch and I hurried after him. Tunja hobbled along behind me.

The radiations from the walls became more intense and brilliant as we went on. The electric torch the American carried was unnecessary now and he snapped it off and slipped it into his pocket. Our entire pathway was lighted with a soft effulgence. The tunnel continued downward; the underground stream was heard clearly, and we went on.

The subterranean passage came to an end. Yawning before us was a chasm about fifteen feet in width. The noise of the stream came up with a sudden rush. Looking sideways, I could see the steaming liquid issuing from a wide opening in the wall on top of the bottomless pit. This must have been the boiling water that we had followed, now letting itself out, flowing down to heaven knows where, through every nook or passage that would admit it.

OUR progress was at an end, it appeared to us; we couldn't span that wide void. The issuing light gave us a view of the wide ledge on the other side, but it might as well have been in another world for all the good it did us. It would be a dangerous attempt to jump. We had no room to make a run—and that terrifying abyss stood ready, with all the odds in its favor, to permanently register us in her abode. It looked as if we had reached the end of our journey and the unfulfillment of our desires.

And then—I'll never forget that sight as long as I live—there appeared upon that ledge from apparently nowhere a stately, arm-folded figure. He looked slowly down into the steaming gulf, unconscious of us. My heart was beating furiously at that unearthly image posing there, gazing at the dropping stream. I couldn't get my eyes off him. He was something preternatural, ready to give way to thin air. He remained poised above that chasm, staring into its depths.

Tunja was abreast of me when he saw that figure. He let out a frightful scream and flopped down upon his knees, looking nothing like the civilized native I knew. At that moment I pitied him.

The figure suddenly raised his head and stared in our direction, surprise and wonder on his face. While I watched he disappeared and appeared almost immediately, another one coming after him. I saw that he had gone behind an obstruction. They looked hard at us, and soon there were half a dozen on the ledge watching us.

I pulled Tunja off the ground into an erect position. The Professor, I could hear, was breathing hard.

They must have made up their minds, because the first figure; the stately one, came close to the pit and raised his arm. I immediately followed suit.

Then he spoke, in surprisingly distinct tones in face of the noisy water, and in the purest Inca *lengua* I had ever heard. I thought that I was a master of that ancient tongue, but I couldn't approach the enunciation of that man. It was a joy for me to hear it.

"You come from the outside?" he asked.

I nodded vigorously. I saw him smile, as if he were pleased that I recognized his tongue and understood.

The ledge upon which the bronzed men were standing was soon packed with surging people. From the first moment they had become aware of our presence they continued to arrive from behind that partition and stare at us.

The tall man who spoke, presumably the leader, raised his arms above his head, and immediately the men and women about him fell to their knees. They broke into a chant, a plaintive moan that gradually grew in intensity and soon filled the air vibrantly. Tunja, his eyes distended, fell to his knees and moaned.

Crowders looked at me. I didn't have to hear him speak to understand what he was conveying to me with his eyes. The chant was old. So old, that had I not known of that worship of the Sun, I would hardly have recognized it. Not that it was something I had heard before! No! This was the first time in my life, and I think the first time in ages, that a living person had listened to a song that was medieval, for I was convinced that it had not survived those old people, the Incas. But these people—who were they?

I tried hard to get a scrutiny of their garments, but they were not near enough. The leader's face was fine and clear even in the distance, but all I could see was a cloak of some sort thrown around his shoulders.

A persistent thought seemed to reverberate through my mind. We had stumbled upon the living descendants of an Inca tribe. Down deep below the surface of the earth they had survived civilization and its changes, and had remained to this day enmeshed in their old customs. It seemed too good to be true. I would be able to study them instead of excavations. The chant rolled into the tunnel in which we stood and the sound became deafening. I was thrilled, eager to go on, to get started.

The swing of the dozens of throats was all in the pure language of a dead race. To my ears it sounded sweet; in reality it might have been somewhat barbaric. In their ceremony they were offering up thanks to some deity for delivering unto them someone from the outside. This clearly puzzled me. It had been a simple matter to follow the tunnel from the outside, and if they had

desired to go out, thought I, they could have proceeded along the passage just as easily as we had. Little did I dream what a barrier was keeping them cooped up.

The curious light issued from every spot, the blue-black gleam throwing itself into us, was literally eating us up. I couldn't explain it, but I was being consumed. My head felt lighter; my legs felt the way they had years before, when I was a young man and athletic. I could feel coursing through my veins the blood of a young and lively body, and I wondered. Scientist that I was, I wasn't misled. It was not the thrill of seeing those aged gestures of the people before me that was changing me. Something was actually entering my body, and, in the sense of the word, rejuvenating the cells which composed me. A new form of metabolism. I couldn't describe it. I only felt it.

The rite came to an abrupt end and they raised themselves from the ground. The leader pointed to us.

"Go back to the intersection and take that other path. It will take you under this ledge. Make haste!"

I could feel the urge in his voice; the desire to talk to us forced the exhortations.

We turned back in that gleaming channel to the intersection. Not once did we utter any word. But the native kept murmuring. In a way I couldn't blame him. The blood of his ancestors was in his veins, to remain forever, and civilization could but instruct him; it could not prevent him from assembling the superstition which had descended to him. He had the look of one going to his doom.

But if such was doom, I was over-anxious to be there. The American led the way and his gait was a fast one. I didn't need encouragement to keep at his heels; I was close upon them. It was Tunja who did the forced hasting.

Once at the intersection, we turned down it. It was harder going than the smooth decline which we had just left. The way was scattered with rocks. The grade was steep; in some places the tunnel was so dangerous that we had to get down on all fours and crawl. Torch light we didn't need. The exuding rays from the walls were very illuminating here, and at times very beautiful. As we went down and down, the light became brighter and brighter, suffusing me with a feeling of endurance. The roar of the stream which emptied into the yawning abyss was to our left this time, but it didn't worry me, as it did the previous time when I had feared coming upon it unawares.

We rounded a short curve. There, advancing haughtily and with firm step, was that inspiring figure who had addressed us at the pit. Following him came men and women who, at the sight of us, quickened their steps.

We stopped. The man was garbed in the clothes of the Inca of medieval time. The designs upon the cloth were the same as those I had seen on drapings of bodies. His face had a fine aquiline nose; his forehead was broad; his hair was dark.

But what engaged my scrutiny was the blue-black stamp on everything, especially on the eye. I shifted my gaze to others who stood near and I was surprised to discover that they all had eyes of the same hue.

The imposing man, after a minute inspection of our dress, beckoned us to follow him. His fine form led us until we had passed the others, and they then fell in behind us.

IT was as bright now as the brightest room when lit by lamps. I could see everything that went on around me, and I could see ahead for some distance. We were entering a large subterranean chamber, whose ceiling was many feet above us, and which was inhabited by many people. There must have been fully a hundred of them there.

Our small party came to a stop near a stone slab upon which rested a carved seat. The leader sat in it, chieftain-wise, and the others fell on their haunches around us. The three of us were the only ones left standing.

It looked like a tribunal of a kind, where we might have been on trial for our lives. In fact, a glimpse at my guide's countenance might have scared you into that belief; but I could see that there was a kind questioning on that chief's face and I had no fears. My dissective eyes were taking in everything of possible scientific count, and I was puzzled.

The face of each man or woman, so far as I could see, bore not the least vestige of fatigue, of sorrow, or of pain. They were smooth, as smooth as the skin of a newborn babe. And yet, as I glanced around, only adults greeted my glance; I could see no children. It was odd. Surely among an assemblage of this kind a child should be visible. And what further perplexed me was that I couldn't see any old persons among them. All were clean-featured, giving off the impression that they must have been born on the same day. The women were good to look upon, even though bronzed in skin, and eyes blue-black.

The old language smote my ear.

"At last you have come," uttered the chief. "The Creator has heard our prayers!"

The people, massed on the ground, nodded their heads.

"A prayer, my people! A prayer to the Creator!"

They fell on their faces as before, when the one on the slab rose and extended supplicating arms towards heaven. The same chant rose from a moaning whisper to a screaming pitch, and this time it was earsplitting, for we were in it. Tunja threw himself down and shrieked with them. Whether it was stark terror or a reversion to his ancestral blood, the sight of his face dug into the ground presented a sorry spectacle.

I could feel the beauty of the thing, even as I watched. If I had been of spiritual inclination I might have let my mind take sway. The giant figure of the American at my side, I could see, had a soft look on his face.

The religious performance subsided and the leader opened his eyes.

"What century is this?" he asked of me.

I couldn't understand the purport of his query, but I replied: "The twentieth."

His eyes widened at that. They roved over our costumes more closely; our closely cropped hair interested him particularly.

"The twentieth century," he murmured in an undertone, "impossible. A dream. So long!"

He seemed incredulous. But it was I who was becoming bewildered more and more. I could feel the gaze of the entire group upon us. It was not a hostile one, only curious.

"Who are you," asked I of the chief, "who speaks the Inca language in its ancient unmarred perfection;

who wears the robes and designs of that ancient people, and whose body is as upright as those were supposed to have been?"

"We," answered the lordly figure, "are Incas."

"Where is your abode?" asked I.

The chief waved his arm in a circle. "Here."

I looked around me but saw no more than I had seen heretofore, a large underground room lighted up by the curious gleam. There was no sign of dwelling construction, no sight of any of the implements necessary to the habitat of man. The only thing visible in the vast cavelike room was the carved stone slab upon which had been seated the head of the tribe.

I was very impatient. My explorer's blood came to the fore. I thought of but one thing now.

"You were an educated and civilized race centuries ago," I told him. "Your ancestors knew the value of records. Was there some way they left their history to you, here in this underground abode?"

I was convinced, since nothing was ever heard of this band of Incas, that they had in some manner survived from some previous day and had descended down to the present. I was intensely anxious, now that I was piercing the gloom with a breath of light, to uncover the records of this unknown people. It would be a valued acquisition.

But I was disappointed. The man shook his head. "We needed none. It is all written indelibly in our minds!"

"What!" said I. "You claim to possess memories in which are stored the happenings of your ancestors?"

Again the chief shook his head.

I was getting bemuddled, not at all befitting the conduct of a scientist. The whole procedure wasn't acting in harmony.

"You still don't understand," said the leader in a low voice; "are we not sufficient proof of our existence? There were no descendants!"

The American spoke up. "But there must have been descendants. You couldn't have been born without elders. Explain that."

The Inca swept us with a patient glance. "I see that you understand me not. I said that there were no people before us here. What I am trying to get you to comprehend is that we, the people you see around you, have lived here for the last eight hundred years in the flesh. We are over eight hundred years old!"

It was a few moments before I fully understood what he told me. Then it crashed down upon my mind. Any other time or place I would have laughed at such a statement. It would have been ridiculous beyond measure. But now I didn't scorn his words. I couldn't. I felt that he wasn't jesting, that it was too true to be ludicrous. And why?

The invigorating ray that illumined this large chamber gave me cause to doubt anything and nothing. Every minute that I stood in its shining light, my body and mind had been getting lighter, my thoughts clearer; as if the mist of years was being lifted solidly from me and a clear and lucid wave of thought was entering.

"Being underground for so long a time," continued the Inca, "never seeing the sun, never smelling a green blade of grass, not being able to get away from the chains which bound us here, and yet living—living—no wonder we lost our sense of time. To us there is no morning, no night. That is why I asked of you what century we live in now. We must have lived here for eight hundred years!"

"Tell us everything," I urged. "Please start from the beginning. But above all, explain how you have lived eight centuries. No one can possibly exist for so long."

The imperious Inca passed his arm over his people. "Even now that we have actually survived those years, it is hard to believe that it is so. But if this is the twentieth century, then we are over eight hundred years old!" He looked suddenly at me, curiously. "Man, how comest that you speak the tongue almost as we? You look not like an Inca!"

I explained my position to him, told of my study of that folk of the Middle Ages, my love for it. From Manco Capac on, I told him, I excelled in its knowledge.

At the mention of Manco Capac, his face broke into brilliance, though not without a tinge of pure sadness.

"You know of Manco Capac? Would that I had taken his word!"

YOU can imagine how I felt when he said that—as if someone of our present day had found a man who had lived in the days of Christopher Columbus and who knew him well enough to take his proffered advice. My head reeled! Take the word of one who was alive in 1100!

"You know our history; you know our customs, then," spoke the sad voice of the Inca. "Could those moments, which are but a delightful memory now, be brought back to us, those sweet times with our people!" Every head swayed in unison.

"Explain everything to us," I begged. I wanted so to free my mind from any doubt, to believe this genuine action of a lost people.

"I," revealed the haughty figure, "I am Tenta Raci. Have you unearthed in our history the existence of one Tenta Raci?"

I heard a crash. Tunja had fallen face downward. His body was groveling in the ground. With the mist that had fallen once again upon me, I could not blame him. If a wandering breeze had caught me at that moment, it would have tumbled me over, so weakened was I.

"Manco Capac's half-brother!" ejaculated I.

"You know!" he wondered. "Do the Incas still exist?"

I shook my head. "Fallen to the dust long ago, are those civilized peoples." I pointed to the fallen man. "That is the remaining flesh of your people."

Tenta Raci closely inspected the guide. "At last! After hundreds of years, to be informed that nothing remains." A great sigh rose from the mass.

"Why does this man," he indicated Tunja, "fall at our feet and bespeak the tone of worship?"

I explained to him, almost half-worshipfully myself, the tradition of one Tenta Raci, the half-brother of Manco Capac, who had gone to a heaven, and how the modern descendants prayed to him.

The Inca nodded as if he understood. "And you?" he asked of me.

I told him of the peoples that were spread across the wide earth, the hundreds of millions who lived now, new races, new nations. His eyes were grave.

"Then the Inca people are no more?"

"No more!" returned I.

"Gone," he whispered, his face raised; "gone are the people of the Sun. Gone are those beautiful roads that carried the feet of my people. Gone are those peaceful valleys, the lordly mountains we dwelled among, when alas! I hoped for better tidings after so many years!" His head fell on his chest sadly.

Professor Crowders looked at me. In his eyes I read wonder, but belief. He did not doubt.

"How have you managed to live so long?" I finally asked. This was the key to the whole situation.

Tenta Raci raised his head. His face was lined. "The rays! These beautiful but cursed rays!" He let his hand move majestically about him. "Oh! That we never should have been permitted to have lived so long, only to find out that our blood and flesh are gone!"

I had the answer now. And every trace of doubt was gone from within me. My head was very light, my muscles getting stronger every moment! The rays! So they were of that power! To keep the body cells in constant replacement—a process of continual rejuvenation! Why this meant immortality!

Was my expedition a success? My mind kept telling me that we had brought to light a discovery that had every other one in the world dimmed for its importance. It was the greatest thing the world would ever know. Millions of possibilities were springing from my subconsciousness.

"This is true, Doctor," said Professor Crowders. "I believe it all." He put his hand on his left eye. "This eye has not had its full vision for the past twenty years. I suffered an accident once. But now it can see as clearly as the other one!"

And that is what I was experiencing. I was fifty-eight years old; I felt as if I were twenty-one. Can I describe the feeling? Hardly! No one on the earth above had ever been transformed as we were. They couldn't understand it, feel it.

"How is it," I asked the Inca chief suddenly, "that you have existed here for so long without food and water? Where are they?"

As I asked him this I had my misgivings. I was reminded of the fact that we had not partaken of food since leaving the camp at the bottom of the hill, and it had been hours of weary, body-racking travel that should have demanded nourishment.

The Inca acted as one reminiscent. "Food! Food!" he mused. "We haven't eaten anything or drunk anything for eight centuries! The rays supply us with everything. It is strange to talk of food. My mouth has taken nothing for centuries!"

On the impulse, I dug my hand into my pocket and removed the scraps of food which I had placed there. I put a hardened piece of bread into my mouth and started to masticate it. I spat it out immediately. I had no desire to eat, and I suddenly discovered that it was because I had no taste. Was it this ray that supplied to the human body all the necessary elements for its maintenance and construction? It could be nothing else, thought I. My body was feeling different. I could sense it undergoing a constant metamorphosis, yet I suffered no ill effects; rather I experienced that desire to fling my arms up, up, and act as one possessed with wings, so light-bodied was I.

"Why do you all look alike? And why are there no children visible?" asked I.

Tenta Raci didn't answer for a moment. "Any question you would ask, I would be compelled to answer 'the rays.' There can be no other. They have the power to change everything. But there is one thing they do that balances their giving of ever-life. And that is, the women of our band can never bear children. They give those rays, but they take more!"

I turned to gather in closely the real essence of the beams emanating from the walls. Deep, bright blue-black was all that I could tell of color; but soft, completely suffusing.

I thought of the wonder that would strike the world when I would make known the discovery! I thought of the countless cures that could be wrought, of the passing of disease and sickness from the human race. I saw now why these many Incas were almost alike in looks: Those rays, over a lengthy period of time, would make them similar. It showed that they were uttering the truth. To think that the earth possessed a cure for its ailments and the answer to immortal life, something that was discovered by a band of medieval Incas in the twelfth century, and to be still unknown in the twentieth.

"Immortal life!" cried I. "Think what it will mean to the races of the earth!"

The Inca chieftain said:: "No! No immortal life, my friend. Because we have lived for so long, is that your idea of immortal life? This life is a curse! We are prisoners here!"

"How so?" I inquired anxiously, remembering.

"We can never go from this underground home. We are here to remain, until the end of time, perhaps!"

All my hopes crashed. I sensed something dire and dreadful under it all.

"We can never leave," continued Tenta Raci, "because to go out into the open sunlight is to reap the worst tortures. These rays are soothing here; but should we leave the tunnel and go some place where there are no rays, then our bodies would succumb. I have seen several members of this tribe fall to the ground in fearful agony!"

I REMEMBERED the disintegrated body of the Inca out on the ledge. And then that one in the faint effulgence in the tunnel. I understood, now, that somehow the rays had kept that body in the tunnel in a preserved state, but had not possessed enough power to retain it in life, when it had gone away from the main body of the emanations.

Suddenly a thought entered my mind and I faced the Inca with terror.

"Then it will do the same harm to us!"

Tenta Raci confirmed my suspicions. "Yes. Even now it has taken a hold upon you. You can return to the outside, for there is yet time; but you will suffer when once your body is away from these rays. Soon it will be too late; there will be no degree of safety."

I didn't know what to do. The American was eyeing me calmly, waiting for me to decide. I knew that he would abide by my decision.

"Take us around your place here," I said to Tenta Raci with haste. "We want to see everything here. Then we will leave at once!"

The people of the supposed heaven rose. The chief quit the stone slab. "Our place is droll. There is nothing of much value. We have nothing to do but live

and think. There is only one thing we enjoy doing here, and that is carving articles from this rock that gives forth the life!"

He led us down into a larger excavation. On all sides were to be seen the most beautiful of carved art. I picked up a vase and inspected it. There was nothing like it on the earth above. It was too gorgeous. Its scintillating blue-black darts of fire continuously issued from the crystal-like rock.

And that was all. Only that room of carved beauties. Could that be the only thing they had done in eight centuries and have retained their equanimity of mind? If so, that ray must possess potent factors that molded over aeons of custom, and the mind.

I was hurried by that revelation of disaster to us. I wasn't afraid of death. If it were to concern me only, I would gladly forego everything and live on here, to glean the essentials of the ray for future lives. But I was a scientist. I must acquaint the world with my discovery. They must find some means to accept it, so that they might benefit by it. I would, I feared, be smiled at when I made this known, but I didn't worry much about that. It was the greatest moment of my life, and I had to give it to the people.

And with this, I took the vase in my hands. The Inca chief urged me to take more, but I could carry this with safety, and nothing more. Crowders and Tunja also took things.

I hastily conferred with the Professor and he advised instant departure. The tribe, headed by Tenta Raci, surrounded us; murmuring something that sounded like a farewell chant, and led us down the path and up the passageway. There was a sad look upon the Inca's face. I could see that he regretted the fact that we were to leave him and his people. Long years were ahead of him before he might see anybody else, if anything should go wrong with us. But once I would acquaint the world, there would be plenty of arrivals.

We were near the juncture of the tunnels when we heard the noise. It was a loud roar.

"It's the subterranean stream," I explained.

The Inca leader stopped with a frown upon his handsome face. "It sounds louder than ever before!"

There opened upon us an aperture in the walls, and a sudden deluge of steaming water soaked us.

"She's broken out!" yelled one. "And the hole is getting larger!"

We rushed pellmell forward, but the whole wall fell upon us. The underground stream, flowing for ages in a channel that was slowly corroding, was free at last. I was seared by the continuous flow of the hot water.

I reached the intersection and dry ground. Looking back, I saw the Professor suddenly fall backwards into the rising waters. I saw other bodies struggling to get away from the eddying, vaporous liquid.

I was the only one free. I darted to save my colleague from disaster, but a swirl of the powerful current caught me before I got far and made me retreat. I was frantic. But I couldn't make any headway in that unleashed stream. I was drenched.

A wave caught me in the back and carried me to the intersection, higher ground. Water was rising and coming my way. It looked like a forewarning, an order to be moving fast. With one backward glance at the tomb of my friends, I ran. I came to the large room. I could hear the swishing of coming water. My body felt suddenly drawn, but I didn't stop. The bluish ray was practically gone now. Darkness was all I had. But my mind was driving me on, out of this burial place. I remembered reaching the opening to the cave; seeing the sunshine dawn in all its splendor. I have some faint idea that I skidded down that trail, and survived only that one chance in a million. Then I distinctly remembered, the last thing, a sudden tightening of my muscles, an indescribable ache, and a terrific noise.

AUTHOR'S NOTE—This amazing manuscript was forwarded to the university in Germany where Doctor Grossbach once taught. His pinched handwriting was recognized, and authentic. It had been years since he had been reported lost, together with the celebrated American scientist, Professor Crowders. The university sent the present head of the department, then Doctor Grossbach's understudy, to Peru, the locality in the malaria-infested district. He found Doctor Grossbach in a native hut in the last stages of life. At his request, he buried him in the soil he loved. But before he died Doctor Grossbach vouched for the document he had written. The wasted man showed him the beautiful vase, the evidence indisputable of what had happened. But it was never brought back to civilization. It was stolen by the natives. Somewhere in the wilds of Peru lies the convincing proof of this fantastic story. And that hill in the Huanuco Junin range is now a crater.

THE END.

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. What is the relation of conceivability and possibility in natural science? (See page 582.)
2. What, according to psychologists, is the driving power of the scientific mind? (See page 585.)
3. What natural factor can be taken as the fourth dimension? (See page 585.)
4. Can mass vary with velocity? (See page 586.)
5. How does the spectrum of the sun indicate a slower vibration of the atom? (See page 594.)
6. What is the relation of our earth to the Galaxy or Milky Way? (See page 622.)
7. What did former astronomers consider the Galaxy? (See page 622.)
8. Is there more than one Galaxy? (See page 622.)
9. What is a generally accepted idea about the velocity of ether vibrations? (See page 626.)
10. How should we characterize inter-galactic space? (See page 629.)
11. Who was the first ruler of the Incas? When did he live? (See pages 638-643.)
12. How might a metallic meteorite be affected in passing through the air to the surface of the earth? (See pages 646-647.)

The Man *from the* Moon

By Otis Adelbert Kline

Author of "The Malignant Entity," "Radio Ghost," etc.

LOOKING forward is always an interesting occupation, for the imagination can be given absolute free play and so many seemingly fantastic pictures may be called into being. But equally absorbing can be the process of looking backward, though it must be done with considerably less freedom of imagination. What was the origin of races? Did all of us—Yellow, Black and White—start our generations in similar manner? How far afield of the truth are anthropologists? Otis Adelbert Kline has pondered on these questions and, being a writer of no mean ability, it naturally follows that his story is well worth serious consideration. Therefore we recommend it heartily, knowing that you will agree with us.

Illustrated by MOREY

WE stood on the eastern rim of Crater Mound—my friend Professor Thompson, the noted selenographer, and I. Dusky shadows lengthened and grew more intense in the great, deep basin before us, as the Sun, his face reddened as if from his day's exertions, sank slowly beyond the western rim.

Behind us, Alamo Edwards, the dude wrangler who had brought us out from Canyon Diabolo two weeks before, was dividing his time between the chuck wagon and our outdoor cookstove in the preparation of our evening meal, while our hobbled horses wandered about near-by, searching out clumps of edible vegetation.

"How is the story progressing, Jim?" asked the professor, referring to a half finished novel I had brought out with me to occupy my time with, while my friend puttered among the stones and rubble in the vicinity.

"I've reached an impasse—" I began.

"And so have I," rejoined my friend dejectedly, "but of the two, mine is far the worst, for yours is in an imaginary situation, while mine is real. You will eventually solve your problem by using your imagination, which has no fixed limitations. I can only solve mine by using my reason, which is limited to deductions from facts. If I do not find sufficient facts either to prove or disprove my theory, what have I? A hypothesis, ludicrously wobbling on one puny leg, neither able to stand erect among established scientific truths nor to fall to dissolution among the mistaken ideas of the past."

"What single, if weak, leg supports your theory that the craters of the moon were caused by meteorites?" I asked.

"You are standing on it," replied the professor. Then, seeing me look around in perplexity, he added: "Crater Mound is the only known Terrestrial formation that exactly resembles in shape the great ring mountains of the moon. If Crater Mound was caused by the impact of a gigantic meteorite with the earth, there is a strong probability that the numerous ringed craters of the moon were created in a like manner."

"But was it?" I asked.

"That is something I can neither prove nor disprove," he replied. "The evidence I have thus far discovered leads me to believe that many relatively small meteoric fragments have fallen here. But they could not have fallen singly, or by twos and threes to make this dent three-quarters of a mile in diameter and more than four hundred feet below the surrounding earth level, to say nothing of throwing up the ring on which we now stand to a mean height of a hundred and fifty feet above the plain."

"Then how could they have fallen?"

"If this great earthen bowl was caused by them, they must have struck this plain in an immense cluster at least a third of a mile in diameter, probably more."

"In that case, what has become of the cluster?"

"Part of it is probably buried beneath the soil. Part of it, exposed to the air, would have been burned to a

Left quite alone in the small, bare observatory room, I lay on my back and watched the progress of the battle. High above me, an enormous cluster of meteoric material was being formed.

fine ash, having generated a terrific heat in its passage through the atmosphere and still having, before it cooled, an opportunity to unite with oxygen. There should, however, be an intermediary residue which I have been unable to find."

"Maybe it was carted off by prehistoric Americans for

the metals it contained," I feebly ventured to suggest.

"Improbable as that statement may seem," said the professor, "there is a small amount of evidence in favor of it, for I have found a number of meteoric fragments miles from the rim of the crater. By Jove! We appear to have a visitor!"

He clapped his powerful binoculars to his eyes, and looking in the direction in which they pointed, I saw a tall, bent figure, apparently attired in a robe or gown, leaning on a long staff and carrying a bundle of poles under one arm, slowly descending the slope opposite us.

"Seems to be a Chinaman," he said, passing the glasses to me. "What is your opinion?"

I LOOKED and saw an undeniably Mongolian face, with slanting eyes, prominent cheek bones, and a long, thin moustache, the ends of which drooped at least four inches below the chin. The voluminous garments, though badly tattered, were unquestionably Chinese, as was the cap with a button in the center, which surmounted the broad head.

"A Chinaman or an excellent makeup," I replied. "Wonder what he's doing out here in his native costume?"

Our speculations were interrupted by the clarion supper call of Alamo from the camp behind us:

"Come an' get it, or I'll feed it to the coyotes."

"You go down and eat," said the professor. "I'm not hungry, anyway, and I want to stay here and watch this curious newcomer. Bring me a bacon and egg sandwich and a bottle of coffee when you have finished."

Knowing my friend's disposition—for once he had made up his mind, a fleet of tractors could not drag him from his purpose—I did not argue with him, but descended to the camp.

While Alamo grumbled about dudes that were too interested in rocks to come for their chow while it was hot, I finished my evening meal. Then, taking my binoculars, I carried his light snack to the professor as requested.

The last pink glow of the sun was fading in the west, and the moon was rising when I reached the top of the ridge.

"Sit down here beside me," whispered the professor. "Our visitor seems to be preparing for a religious ceremony of some sort, and I dislike disturbing him."

While my friend munched his sandwich and sipped his coffee, I used my binoculars to watch the Chinaman. He had erected four poles supporting four others which formed a square above a low, flat-topped rock near the center of the crater. Suspended from the horizontal poles by cords were many small objects which were apparently very light in weight, for they stirred like leaves in the breeze. A lighted taper stood in the center of the flat rock, which was surrounded by a ring of thin sticks that had been thrust into the ground. The Oriental was on his knees before the stone, immobile as the rock itself, his face turned in our direction.

"Seems to be keeping his eyes on us," I said.

"I think he is waiting for the moon to rise above the crater rim," replied the professor, once more applying his eyes to his own binoculars.

My friend was right, for as soon as the first shaft of moonlight entered the crater the kneeling figure was galvanized into action.

Bursting into a singsong chant, quite audible, if unintelligible to me, the Celestial applied the flame of the taper to each of the thin sticks he had planted around the stone, all of which were soon glowing like burning punk. Then he stepped beneath one of the objects suspended from a horizontal pole, made a short speech in the direction of the moon, and lighted it with the taper. It burned out in a few seconds, casting a weird, yellow light over the scene. Stepping beneath the next suspended object he made another speech and lighted that object also. This one burned with a blue flame. He continued thus for several minutes until all the dangling objects had been consumed—each with a different colored flame. Then he extinguished the taper and knelt once more before the stone, resuming his chant, and prostrating himself from time to time with his forehead touching the stone. The breeze, blowing in our direction, was laden with the sweet, heavy odor of burning sandalwood and musk.

A half hour passed with no change in the ceremony. Then the burning joss sticks winked out, one by one. When the last went dark, the kneeling man made a final obeisance, then rose, took down his framework of poles, tucked them under his arm, and leaning heavily on his long staff departed toward the west.

"Show's over," I said. "Shall we go back to camp?"

"Hardly," replied my friend. "I'm going to follow him. In this bright moonlight it should be easy. By Jove! What has become of him? Why the fellow just now disappeared before my eyes!"

"Maybe he fell into a ditch," I hazarded.

"Ditch, fiddlesticks!" snapped the professor. "I've explored every square foot of this crater and know there is no depression of any kind where he was walking."

"Eastern magic," I ventured. "Now you see it, now you don't."

"Rot! You stay here and watch the western slope with your binoculars. I'm going down to investigate."

I watched, while the professor stumbled hastily across the crater and frantically searched the vicinity of the place where he had declared the Celestial had disappeared. After a twenty minute hunt, he gave it up and came back.

"Queer," he panted as he came up beside me. "Deucedly queer. I couldn't find hide nor hair of the fellow—not even the burnt ends of his joss sticks. Must have taken everything with him."

We returned to camp, squatted beside the fire, and lighted our pipes.

Alamo had stacked the dishes, putting off to the last the one camp job he hated—washing them—and was picketing the horses. Suddenly we heard him sing out:

"Well, look who's here! Hello, Charlie. You wantee come along washee dishee, gettee all same plenty much chow?"

Looking up in surprise, I saw the tall, ragged Oriental who had disappeared so mysteriously a few moments before, coming toward us. He was still leaning on his long staff, but minus the poles he had previously carried.

THE professor and I both leaped to our feet from places beside the fire.

The Chinaman paused and looked at Alamo in evident bewilderment.

"I beg a thousand pardons," he said in excellent English, "but your speech is quite unintelligible to me."

"Well I'll be damned!" Alamo tilted his broad Stetson to one side and scratched his head in amazement.

By this time my excited friend had reached the side of our Celestial visitor.

"He was only inviting you to sup with us, in the patois of the West," explained the professor.

The Chinaman bowed gravely to Alamo.

"Your magnificent hospitality is duly appreciated," he said, "but I beg to be excused, as I may not partake of food in the presence of the mighty Magong." As he uttered the last word he extended his left hand toward the moon, then touched his forehead as if in salute. There was something majestic about his bearing that made one forget the tattered rags in which he was clad.

"We accept your excuse without question," said the professor, quickly. "Permit me to welcome you to our campfire circle."

Our guest bowed low, moved into the circle of firelight, and laying his staff on the ground, squatted before the fire. Then he took a long stemmed pipe with a small, brass bowl, from one of his capacious sleeves, and the professor and I both proffered our tobacco pouches.

"I'll use my own, with your indulgence," said our visitor, filling his pipe from a small lacquered box he carried. Before closing the box, he threw a pinch of tobacco into the fire, raised his left hand toward the moon, and muttered a few words unintelligible to me. Then, after touching his forehead, he lighted his pipe with the glowing end of a stick from the fire.

After puffing in meditative silence for a few minutes, he said:

"As I have thanksgiving devotions to perform, my time is limited. I will therefore, as briefly as possible, explain the reason for my visit, and convey to you the communication of the great one, whose humble messenger I am.

"Twenty years ago I was a Buddhist priest in T'ainfu. It was expected of every member of our order that at least once during his lifetime he should make a pilgrimage to a certain monastery in Tibet, there to perform mystic rites in a secret sanctuary, where a sacred stone of immemorable antiquity was kept. I made the pilgrimage, fully expecting to return to T'ainfu, as my brother priests had done and take up the duties of my humdrum existence there for the term of my natural life.

"There are things which I may tell you, and things which I may not disclose, so let me explain, briefly, that the whole course of my life was changed when first I viewed the sacred stone. It was graven with mystic characters, similar to, yet unlike Chinese writing. According to tradition, none but a living Buddha could decipher this sacred writing, which might not be transmitted to any of his followers, however great or wise.

"Now I had, from the days of my youth, made a study of our ancient writings, and had learned the meanings of many characters since wholly obsolete, as well as the former meanings of those whose significance had been entirely changed. I firmly believed, with my fellow priests, that none but the living Buddha might translate the writings on the stone. You may judge, therefore, of my surprise, when I found myself able to translate several of the ideographs graven on its sacred surface. I instantly believed myself the true possessor of the *karma* of Buddha, and that the living Buddha of my order was an impostor. On attempting to translate other characters, I found the majority of them unintelligible to me.

"One of the requirements of my pilgrimage was that I was to spend four hours a day for a period of seven days alone on my knees before the sacred stone. A guard, posted outside the door, saw to it that but one pilgrim was admitted at a time. On the day following, I secreted writing materials in my clothing, and spent the time allotted to me on that day, and the five days following, in carefully copying the writings on the stone.

"I carried my prize away without detection, but did not return to T'ainfu. Instead, I wandered from monastery to monastery, from temple to temple, conversing with the learned men and reading the ancient records to which I, as a pilgrim priest, was usually given access without question. The task of translation, which had at first appeared easy, took me ten years to complete.

"When it was finished I knew that it had not been written by God, as was supposed, but by the first earthly ancestor of my race, and I found myself charged with a trust which appeared as difficult of fulfillment as the translation itself. The crater which you have been investigating was described to me—yet its location was unknown to the writer. I was charged to find it and to find you. It took me nine years to find the crater, during which time I visited thousands, none of which exactly fitted the description. It took me a year more to find you and to receive the sign."

"May I ask what sign you refer to?" inquired the professor.

"My illustrious ancestor, who charged me with the task of conveying his message to you, said in the writing that his spirit would be watching me from Magong. He prophesied that you would appear at this place, and when you did, he would flash a brilliant signal to me from his Celestial abode."

"And you have seen the signal?"

"I have and do, for it is still visible. Look!" He pointed toward the full moon.

The professor looked, then raised his binoculars to his eyes and focused them.

"By Jove!" he exclaimed. "You have unusually sharp eyes. There is a brilliant, star-like light in the crater, Aristarchus. A rare occurrence, too."

"I have studied Magong for many years," replied our guest, "and have trained my eyes to see things hidden from the sight of ordinary mortals. I could have used a telescope or binoculars, but for my purpose I have no need of them."

"Remarkable!" commented the professor. "And this light fulfills the prophecy?"

"To the letter. Permit me to deliver my message, therefore, and depart, for I have much to do before Magong veils her face once more."

Drawing a large, bulky envelope from his pocket, the Oriental arose and handed it to the professor with a profound bow.

Springing to his feet with alacrity, the professor accepted it with a bow as low and dignified as that of the donor.

"Man of science," said our guest. "Use this message as you will, for that is your privilege, but you will confer a favor on the illustrious sender and bring manifold blessings on yourself and your descendants if you will use it to advance the knowledge of mankind."

"I will endeavor to use it as you ask," replied the professor, "and thank you for it, and for the trust you have placed in me."

"Do not thank me," was the answer, accompanied by a significant gesture skyward. "Thank P'an-ku."

"I will, and do. May we not have the pleasure of your company tomorrow?"

"A thousand thanks, and as many regrets, but my task will have ended when Magong veils her face, and I am weary and would return to T'ainfu. So farewell."

He took up his staff, and without a further word, stalked majestically out into the moonlight. The last we saw of him was when his tall, gaunt figure was silhouetted against the sky for a moment on the crater rim.

With trembling fingers the professor broke the seal of the envelope and drew therefrom a neatly written manuscript. It was in English, and he read it aloud to me, while Alamo snored lustily from the folds of his blanket, several yards away.

With Professor Thompson's permission, I publish it here for the first time, making it clear at the outset, that while it seems to explain many matters which have puzzled our leading scientists for hundreds of years and is not, in the light of our present knowledge, either susceptible of proof or refutation, we cannot vouch for its veracity.

The Story of P'an-ku

HAVING attained the advanced age of two hundred and ninety-eight earthly years, and feeling the hands of San-miau, the devourer, grim messenger of the Supreme God, T'ien, ever closing tighter on my throat, slowly squeezing out my soul from this old shell of a body, I, P'an-ku, lord of thousands, founder of a new race, and last survivor of an old, have retired from my manifold duties and pleasures—the ordering of the affairs of my subjects, the company of my wives, my children, and my children's children, who will someday be numerous as the stars of heaven—to write this history of my own people for those to come who will have the intelligence and the desire to understand it.

For a million historical years, men of my race inhabited Magong when she was yet a planet among planets, a free, rotating sphere with her own undisturbed orbit, midway between the orbits of this planet and that of the terrible, devastating war-world, Mars. For a half of those million historical years, an ancester of mine—a P'an-ku—sat on the imperial throne of Magong and held dominion over all her lands and seas.

When I was born, Crown Prince of Magong, my people had reached an advanced state of civilization, for much can be accomplished in a million historical years. For more than ten thousand years, Magong had been in communication with Mars, the only other planet inhabited by intelligent beings. For over five thousand years, our interplanetary ships had visited their planet, and their ships had made friendly calls on Magong, carrying passengers, manufactured merchandise, and raw materials. A colony of their pale, white people, whose faces I wish we had never seen, was founded on one of our continents and treated with every friendly consideration by our rulers: that is, my ancestors. A colony of our stalwart yellow people had also settled on Mars, and had been received with every appearance of good will.

Before I was sixteen years of age I had learned to navigate an ether ship, and when I had demonstrated to my father's satisfaction that I was a thorough master of interplanetary navigation, he permitted me a leave of absence of two years for the purpose of visiting the inner planets—Earth, Venus and Mercury. This trip was mostly for my own education, as all three of the planets had been explored thousands of years before, and had subsequently been visited at regular intervals by our scientific expeditions for the purpose of tabulating the evolutionary changes taking place on them. Mercury had developed nothing but the most lowly vegetable organisms. Venus teemed with life, ranging from the microscopic, unicellular animalcules to gigantic, four-footed reptiles, which roamed through her great forests of fern and fungi, some of them feeding on these and other primordial thallophytic growths, some preying on these herbivora or on the lesser creatures coexistent with them on that planet. Some of them had evolved membranous wings with which they flapped clumsily from place to place, but there were no birds or mammals. Among the plants, none flowered or bore fruit or seeds. All reproduced by spores or spawn or by simple fission.

On the Earth, a higher order of evolution was in progress. Many of the plants, having developed specialized sexual organs, flowered and bore fruit. Birds forsook the ways and forms of their reptilian ancestors——evolved a thousand shapes and hues—cultivated glorious plumage and melodious voices. Mammals suckled and reared their young, and man, the greatest mammal of them all, was slowly battling his way to world supremacy with crude weapons and implements of wood and stone.

On my return to Magong, after visiting the inner planets, I importuned my father to permit me to visit Jupiter. This he flatly refused to do. The trip, he said, was too long and dangerous for one of my years. Furthermore, only one, out of a thousand of our most skillful and experienced navigators, who had attempted the trip, had returned to tell of it. I had to be content, therefore, with several trips to Mars, where I, as Crown Prince of Magong, was always received with such pomp and splendor that I wished I might be permitted to go incognito and mingle with the common people—but even this small pleasure was denied me.

At twenty-five, I was made commander-in-chief of Magong's interplanetary navies. Shortly thereafter, trouble developed between my father and Lido Kan, Supreme Ruler of Mars. It seems that a number of Martians, jealous of the economic progress made by our colonists on that planet, had gone to Lido Kan with tales of woe, insisting that they be deported. So strong was the pressure they brought to bear on him, that he finally took the matter up with my father. The reply of my father was courteous, but firm. He insisted that if his people were to be deported from Mars, the Martian colony must also leave Magong. Lido Kan argued that his people had created no disturbance on Magong, and no dissension among the subjects of my father, which was true enough, and my father naturally retorted that his subjects were too courteous to even think of bringing up such a matter.

One word led to another, and things went from bad to worse, until a group of Martians attacked and massacred the inhabitants of one of our settlements. My father instantly demanded an imperial apology from Lido Kan, complete punishment of the perpetrators of the crime, and indemnity for relatives of all the massacred people.

Lido Kan delayed his reply for several days, but was eventually swayed by the jingoists of his realm, and replied that he would neither apologize, pay indemnity, nor punish any of his subjects, as my father had received fair and timely warning. While my father debated what to do in this crisis—for he had always been a man of peace—word came that an army of Martians had completely wiped out our colonies on that planet.

A short time thereafter, the commander of one of our large interplanetary passenger ships ether-waved me that the Martians would not permit him to leave port, and that several hundred of our ships were being held in a similar fashion. I immediately left Magong with a fleet of battleships, intending to demand their release or fight, but was met half way by a fleet of Martian warships.

THE contest that ensued was short and disastrous. My fleet used the cold, energy-decreasing green ray of condensation, which we had developed—the enemy fleet, the hot, energy-increasing red ray of dispersion. We had developed our inter-rotating green rays to such a degree that any substance touched by them would contract to less than one-hundredth of its normal size with a corresponding increase in density. The toughest metals, under this ray, would become as brittle as egg shells and more dense than pure lead.

The effect of the red rays of the Martians was the opposite, but fully as devastating, as these rays, rotating in receding spirals, tore the atoms apart on contact, making the heaviest metals less dense than the atmosphere in an instant. When a green ray met a red ray of equal intensity, they neutralized each other.

By superior maneuvering, I managed to wipe out the last Martian battleship when I had lost all but the flagship of my fleet. This had been badly crippled by a red ray, and after making temporary repairs, I limped sadly back to port.

On the face of my father, when I reported to him in the throne room that day, was a look, sterner than any I had ever seen him wear.

"My son," he said. "War is a terrible thing—the worst affliction that can come to humanity—but it is at hand and we must meet it like men. The Martians have made a start by wiping out our colonies and attacking our fleet. Now they are determined to eliminate us entirely from the solar system. At this very hour they are preparing to use their most terrific weapon of all against us."

"What weapon is that, O my father?" I asked.

"Come with me, my son, and I will show you."

He led me up to the great observatory on top of his palace. We passed through the general observation room, where a hundred enormous telescopes were in constant use—a thousand trained men observing, recording, and manipulating the instruments. Going into his private observation room, my father himself trained his huge telescope on a distant object. Then he called me to look. I saw what appeared to be a huge spiral of nebulous matter forming near Mars.

"They are clearing the interplanetary lanes for the passage of a huge fleet," I said. "See, they are collecting all the meteoric bodies for millions of miles in all directions."

"They are doing more than that, my son," my father replied. "That matter-condensing and projecting apparatus which they formerly used to clear the way for peaceful ships is going to be used for a horribly deadly purpose. Have you noticed *where* they are condensing the meteoric mass?"

"It seems to be on a line between Magong and Mars," I replied.

"It is. Have they ever condensed material in that position before? You know full well they have not. They have always concentrated it in a position where it could be projected out into space without harm to anyone."

"Why, Father, what do you mean?"

"I mean that as soon as that synthetic nebula reaches a sufficient degree of cohesion and solidity it will be projected at *us!*"

"What will it do? Will it burst our planet asunder? Will everyone be killed?"

"No. It is not large enough for that, but it can do incalculable damage, and if their aim is good and they are not stopped in some way, they can collect enough of such matter from the meteoric belts of the solar system to depopulate this planet."

"Can't we dodge them? What about the new gravity control plant?"

"The thing is still in the experimental stage. Besides, it is a terrible and a dangerous thing to disturb or attempt to change the orbit of Magong. Every body in the solar system is in perfect balance with every other body, and too great a change, even in the orbit of our own relatively small planet, may cause untold damage—some upset of the scheme of things, which we cannot possibly foresee. True, we have slightly perturbed the motion of Magong, just as an experiment, but it has been done cautiously, and always with a counter-perturbance sufficient to bring it back to the proper place in its orbit."

Once more my father looked through the giant telescope.

"The projectile is formed and on the way," he said gravely. "Where it will strike, no one can tell—not even those who are sending it. It may crush this palace, destroy this city. It may kill nobody or wipe out a million people. It may miss Magong entirely, but this is not probable. We are too large a target. Let us go below. There is nothing more we can learn here at present. I will show you the only efficient aggressive weapon to which I can turn at present. By this, and by the remaining interplanetary fleets under your command, the question of our very existence will be determined."

We descended to the main floor and entered a compression tube car, in which we were shot to one of the numerous physics laboratory stations of Magong. My father presented Wang Ho, the venerable chief scientist of the institution.

"Wang Ho," he said. "Is the atmosphere disintegration ray ready?

"It is ready, your majesty," was the reply.

"Then train it on Mars. They insist on war, so we will give it to them in earnest. They are determined to destroy the face of our planet, therefore let us remove the atmosphere from theirs."

"Your majesty is aware, I hope, that a continuous use of this ray will be suicidal. For every ten cubic parsads of their atmosphere we send out into space, we also send out one cubic parsad of our own. If your majesty would wait, and have a number of these ray projectors

made in portable size, they could be fastened to other ships and used without destroying our own atmosphere."

"Unfortunately," replied my father, "we cannot wait. The war is on. It may be decided in a few days. Several weeks would be required to fit out other ships with these ray projectors. No, we must fight now, or be forever beaten. Turn the ray on them, and keep it going as long as they are in range. Our other projecting stations will take up the duty, one by one, as the planet revolves on its axis."

He turned to me.

"My son," he said. "The entire war fleet of Magong is in your keeping. Save the fleet if you can, yourself with it, but remember—it is only a barrier. It is one of the protections of Magong. If the barrier must be destroyed in the line of duty—then do not attempt to save it at the cost of that which it was set up to protect. Do you understand?"

"Fully, father. I will be wary and circumspect, but I will not fail in the line of duty."

Once more we entered the compression tube and were shot back to the imperial palace. After bidding farewell to my mother, I said a last goodbye to my father, and went out to my flagship. There were tears in the eyes of my mother as she called her last farewell to me. My father was too much of a man of iron, however, to betray his emotion at such a time.

MY fleet of ten thousand other ships was ready for action, awaiting only my word of command. I had formed a daring plan which, if successful, might mean the destruction of the fleet and my own death, but would make it possible for Magong to win the war.

Leaving half of my ships to guard the planet against enemy craft, I took the other half and made straight for Mars. Shortly after we started, the first huge missile of the Martians passed us, and a few minutes thereafter it struck Magong with a brilliant flare of light, leaving a great dark pit in the ground where it had fallen. Referring to my charts I found that it had alighted on a small village of about two hundred souls. What a sudden and terrible end for them!

As we pressed onward, I saw another large nebula spiraling into shape, and knew that it would not be long until a second projectile was on the way to Magong.

Presently I saw a huge enemy fleet put out from Mars, evidently with the intention of meeting and giving battle to my fleet. This did not fit in with my plans at all, so I immediately gave secret orders to all of my commanders, then bade them disperse.

There were nearly a thousand magnetic wave stations on Mars, most of which were in continuous use because of the terrific efforts the Martians were putting forth to crush Magong. These stations were sending out powerful, man-directed magnetic lines of force, which drew all relatively small particles of matter, with which they came in contact, toward the stations from which they were projected. This procedure would have been dangerous to the Martians themselves had they not been clever enough to cross the lines of force and form contracting vortices, hundreds of thousands of miles from their planet. Under the direction of the central station, these vortices were combined and recombined at regular intervals, until visible nebulae resulted. The nebulae were condensed by extra and special lines of force from the central station, then projected at Magong, close-knit, spherical clusters of stone and metal. When the central station was turned away from the target by the axial rotation of the planet, a duplicate-control station on the other side carried on the work under the control of the same operators.

During the progress of my ship toward Mars, six of these huge clusters were projected at my world. Five of them struck the target and one missed, to shoot out into space and become an asteroid with an orbit of its own around the sun.

My plan was simple and direct. Each of my ships carried a chart, showing the location of the thousand enemy wave stations. Each station was numbered, and five ships were assigned to the attack of each.

My ship, together with four others of the most powerful of my navy, each carrying a battery of twenty huge ray projectors, were to attack the central magnetic station.

While we neared Mars I watched the movements of the enemy fleet, and saw that it was heading straight for Magong, evidently pleased at the fact that my first fleet had dispersed. This exactly suited my plans, as I knew that Hia Ku, my able lieutenant, would give them a warm reception with the five thousand ships I had left under his command, and I would be free to carry out my attack.

When I drew near the central wave station of the Martians I saw that my other four ships had arrived on schedule, and ordered the attack. We were discovered almost instantly, and a thousand red rays were flashed at us, but we were able to neutralize these by laying down a barrage of green rays. Then a number of Martian ether ships, reserved to guard the central station, arose and attacked us from above. One of their rays pierced our upper barrage and one of our ships, with her controls destroyed, plunged dizzily groundward, but was disintegrated by the red rays before she had fallen half way.

With this ship gone my barrage was weakened, and I knew that it would only be a matter of minutes until we should all meet a like fate. As certain death faced us, I thought quickly, and as quickly gave orders, resolving that in our passing we should at least cripple the central wave station of the enemy. My ships instantly responded to my command, and in a moment all were plunging directly downward, temporarily protected above and below by our green ray barrage—our objective the glass dome of the central wave station. It was my hope that when we crashed through this dome to our death we might destroy, or at least cripple this station, and thus hamper the Martians and give my father the time he needed to fit out other ships with atmosphere destroyers, thus assuring the victory of Magong.

But the Martians were too wise for me. They must have suddenly focused their lines of magnetic force on our ships, forming a contracting vortex a short distance above the dome, for we lost control of all of them simultaneously. They revolved about each other for a moment, and then crashed together. With that crash I lost consciousness. . . .

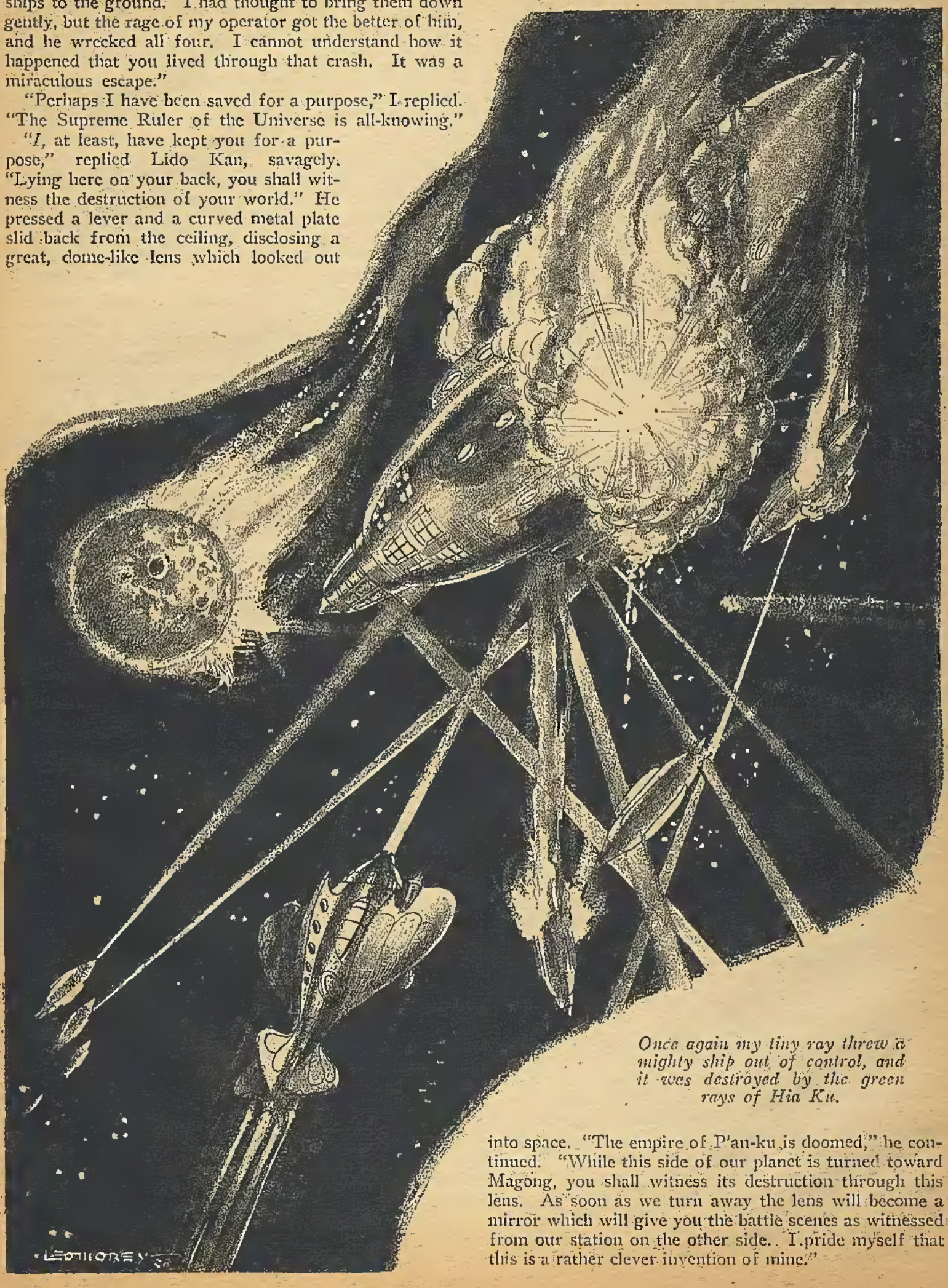
When I recovered my senses once more I was lying on a metal bench to which my hands and feet had been bound. Standing over me with a sneering smile on his pale face was Lido Kan, Supreme Ruler of Mars.

"What happened?" I asked, bewildered. "Where are my men?"

"All died but you," he replied, "when we brought your ships to the ground. I had thought to bring them down gently, but the rage of my operator got the better of him, and he wrecked all four. I cannot understand how it happened that you lived through that crash. It was a miraculous escape."

"Perhaps I have been saved for a purpose," I replied. "The Supreme Ruler of the Universe is all-knowing."

"*I*, at least, have kept you for a purpose," replied Lido Kan, savagely. "Lying here on your back, you shall witness the destruction of your world." He pressed a lever and a curved metal plate slid back from the ceiling, disclosing a great, dome-like lens which looked out into space. "The empire of P'an-ku is doomed," he continued. "While this side of our planet is turned toward Magong, you shall witness its destruction through this lens. As soon as we turn away the lens will become a mirror which will give you the battle scenes as witnessed from our station on the other side. I pride myself that this is a rather clever invention of mine."



Once again my tiny ray threw a mighty ship out of control, and it was destroyed by the green rays of Hia Ku.

I made no reply, but looked eagerly out toward Magong. Already the once fair face of my planet was growing pock-marked and ugly from the cruel disease called war.

"You are a clever whelp," continued my captor, watching my features closely, "but not clever enough for Lido Kan. Your ships destroyed two hundred of my magnetic wave stations, but it will not take long to rebuild them, and in the meantime the others are functioning quite successfully, as you will observe. At least half of the population of Magong has already been destroyed by my projectiles."

"Don't be too sure of victory," I replied. "By the time you have destroyed Magong, you may find yourself without an atmosphere."

"Hardly. It will take many days for your father to destroy our atmosphere. One week is all I require to silence all of his ray projectors and exterminate his people. But enough of this idle talk. I must to the grim work before me. I leave you to the pleasant contemplation of the dissolution of your heritage—the empire of Magong."

LEFT quite alone in the small, bare observatory room, I lay on my back and watched the progress of the battle. High above me the Martians were forming an enormous cluster of meteoric material. Already it was at least ten times as large as any they had projected at Magong, and they continued to add to it. Presently I saw that it was ready to be projected. There was a terrific roar from the machinery in the building around me, and the huge globe shot outward, but not in the direction of Magong. It described a short curve and began to fall directly upon Mars. Once more there was a roar from the projector machinery, and once again the sphere shot outward, only to return, drawn by the terrific pull of Mars' gravity on its great mass.

A feeling of exultation came over me, as I saw that my enemies failed, again and again, in their efforts to project the sphere. It appeared to me that they had brought destruction on their own heads. But Lido Kan was not without resource. Suddenly I heard a more terrific roar from the machinery than had occurred before. A great section was split from the mighty sphere, and simultaneously, the larger and smaller pieces were projected obliquely out into space. This time they did not fall back, but continued to travel in curved paths. The smaller, moving much more swiftly than the larger, soon disappeared from view, but it reappeared again in a few hours. The larger, moving more majestically across the sky, appeared to travel in a direction opposite to that taken by the smaller, because of its slower motion and the axial rotation of the planet. I had witnessed the formation of the moons of Mars.

Foiled in his attempt to hurl so huge a projectile, Lido Kan once more turned his attention to the firing of smaller ones. Hour after hour I watched, my lens presently turning to a mirror as Mars turned her face away from Magong, and each hour added to my sorrow as I saw the surface of my planet turning to enormous ringed pits. Presently an attendant brought me food and drink. Afterward, I slept at fitful intervals.

Days passed, and I detected new tactics on the part of my father. He evidently decided to risk all in an attempt to dodge the projectiles, for I saw that Magong was shifting out of her orbit—moving in closer to the sun in an eccentric fashion that would make it difficult for an operator to properly aim and time a projectile intended to strike her.

Soon I saw that he had moved into the orbit of Earth, then beyond it, between the orbits of Earth and Venus. At first I could not fathom his plans, but gradually they dawned on me, as I saw Earth come along and Magong fall in behind her. It was his intention, I felt sure, to use the larger planet as a shield against the devastating Martian projectiles.

Something must have gone wrong with his control station, however, for Magong presently fell behind the Earth in her race around the sun, then rose, crossing her orbit behind her, and hurried forward to catch her once more—this time outside Earth's orbit, between Earth and Mars. Something, also, had happened to Magong's rotation on her axis. Whereas she had previously revolved once in every twelve hours, she now turned with exceeding slowness. Rushing on past Earth, she continued for some distance, then paused and fell back once more to wait for the larger planet. Magong, I could clearly see, was caught in the gravity net of Earth. Thus she had become a satellite of that planet, even as the huge broken projectile of Lido Kan had become two satellites of Mars.

Lido Kan kept up his pitiless bombardment of Magong, once he had grown accustomed to her new orbit, with deadly accuracy. Once, and once only did I see him miss, the projectile, which was a relatively small one, passing Magong and striking somewhere on the planet Earth—I could not tell just where because of the silvery cloud envelope that hid her surface from view.

Although fully four-fifths of her population must have been wiped out by this time, I knew that Magong still kept up the fight, as the atmosphere in my room grew rarer each day until breathing was a painful effort.

One day Lido Kan entered my room. Strapped to his back was an apparatus containing concentrated air, from which he took mouthfuls from time to time.

"I come to take leave of you, young whelp of P'anku," he said. "My people are dying by the millions for want of air, thanks to the infernal rays which your father has managed to keep trained on us. Our dissipated atmosphere cannot be brought back, nor could we manufacture a new one, from the elements locked in the soil, in less than a thousand years. I am leaving, therefore, with the five hundred large ether ships I still possess, for the purpose of colonizing the damp, unhealthful and savage planet, Earth. My wave projecting stations, I will leave manned, each being provided with a supply of concentrated air, and committed to the task of continuing the bombardment of Magong until death overtakes them.

"I will have one of your hands unfettered, and will leave you plenty of food and water so that when death finally overtakes you, you will be slain by your own father, as he continues to dissipate our atmosphere. And so, farewell."

He went out, and shortly thereafter, my attendant came in, placed a tank of water and a large basket of food within reach, and unfettered one of my hands. Then he, too, went out, and I was left alone, gasping for breath, as the atmosphere continued to grow more rare.

Presently I saw the fleet of Lido Kan set out. Instantly, with the thin point of one of my eating sticks, I set about picking the locks of my fetters. Within an

hour I had freed myself. Finding my door unlocked I rushed from the room. Presently I blundered into the great deserted room from which the official Martian ether visiphone messages had formerly been sent to Magong. Opening a switch, I found that the power was still on, and signaled the station of my father. My heart gave a leap of joy when his face suddenly appeared in the disc before me.

"Have you any ether ships left?" I asked him, after we had exchanged greetings.

"Not quite a thousand."

"And does Hia Ku still live?"

"He lives, and commands the fleet during your absence."

"Then dispatch him at once to find and destroy the fleet of Lido Kan, who has just left here with five hundred ships, purposing to colonize Earth."

"Then the atmosphere is nearly dissipated?"

"It is."

"But what about you, my son? Are there any ships left in which you can return?"

"There are none near-by, and I have not the strength left to go out and search for more. My death is only a matter of hours, and I am resigned to my fate."

"Do not despair, for I, your father, will save you. I will shut off the atmosphere-destroying rays at once, and will have a small, swift ship there to bring you back in less than four hours."

I RETURNED to the room where I had been imprisoned, to watch for the ether ship, and true to the word of my father it appeared in less than four hours—a tiny, one-man craft. I hurried to the roof, reaching it just as the ship alighted. A man stepped out—an old and faithful servant of my father.

"The ship from His Majesty, your father, Highness," he said.

"But why a one-man craft?" I asked.

"Hia Ku took all the others when he left to attack the fleet of Lido Kan," he replied. Then, before I could prevent him, he took a small, green ray projector from his belt and pressed the muzzle to his abdomen. With a gasping "Farewell, Highness," the brave and loyal fellow dropped dead at my feet.

Hurrying below once more, I entered the ether visiphone room and signaled my father. His face appeared in the disc. I told him what his messenger had done, and tears streamed from his eyes.

"Just another sacrifice to the rapacity of Lido Kan," he said. "Get into your craft now, and I'll turn on the rays once more."

I lost no time in getting back to the little craft and away from Mars. I was making swift progress toward Magong, when suddenly I happened on the remnants of the two battle fleets. There were only three of our ships left, and they were beleagured by four enemy craft. Both flagships were still intact, and at the time, dueling with their enormous ray projectors—green against red. As I approached them, one of our ships was cut in two by a red ray, the halves hurtling out through space.

I had one small ray projector on my forward deck—a puny weapon indeed against those of the huge battleships, but I determined to enter the unequal contest. Selecting the helmsman's turret of the nearest enemy ship, I plunged toward it. My approach in the tiny craft was apparently unperceived, and I did not turn on my green ray until within less than a thousand feet of my target. When the ray struck it, the turret instantly collapsed, and the ship, out of control, swung broadside, scattering her ray barrage and leaving her hull unprotected. I instantly turned the nose of my craft upward and passed over her, noting as I did so that she had been broken up by the huge green rays from our two remaining battleships.

Without pausing to give the enemy a chance to understand just what had happened, I quickly plunged at the helmsman's turret of the next ship. Once again my tiny ray threw a mighty ship out of control, and it was destroyed by the green rays of Hia Ku. This time, however, I did not escape unscathed, for one of the red rays of the second ship, shooting wildly upward as she went out of control, had carried off part of my forward deck.

I tried to close the safety plate beneath my instrument board, to keep my air and warmth from escaping into outer space, but it stuck, and a cold that closely approached absolute zero swept over me. With numbed hands I pulled frantically at the recalcitrant plate, and in a moment more had it in place. In the meantime, however, my small, swift craft had hurtled away uncontrolled to a position nearly a thousand miles from the four remaining combatants.

I swung her to, and steered for the battle scene once more. Then I saw something which wrung a gasp of horror from my lips—a huge meteor cluster from Mars, rushing straight at the four ships. I had no time to signal them—to do anything, in fact. A moment later it struck them, and all four combatants disappeared in a blinding flash of light without appearing to have had the slightest effect either on the path or the mass of the projectile.

With a heavy heart, I turned my ship toward Magong. A short time after, I saw the projectile strike. There was a small chart on board, and on referring to it, I found that it had destroyed one of our atmosphere disintegrating ray stations.

A two-hour run took me to Magong, during which time, four more enormous projectiles hurtled past me on their death-dealing errands. As I steered toward the palace of my father a fifth shot past me, hurling my tiny craft through the thin atmosphere like a leaf caught in a whirlwind. When I succeeded in righting it, and looking downward once more, a chill of horror crept over me, for this last messenger of death had dug a huge pit more than sixty miles in diameter, and the center of the pit marked the spot where my father's palace had stood. My beloved parents were no more. P'an-ku, the mighty monarch, was dead. *I* was P'an-ku, ruler of a desolate waste that had once been the mighty, flourishing empire of Magong.

I alighted near the rim of the enormous crater and stepped out of my craft. A moment later, gasping for breath, I hastily sprang back inside and closed the door. The atmosphere of Magong was nearly gone. With her huge ray projectors still going, she was committing suicide in order that her hated enemy might be destroyed.

Rising, I made for the nearest ray projector station. Circling close to it, I peered in the windows. Not a living soul greeted my gaze, but there were many dead bodies on the floors. The projectors, however, were still working—pointed by machinery set to keep their rays on Mars until they should fail to function for lack of power.

An occasional meteor cluster struck Magong from time to time, but they grew smaller and fewer in number—a sure sign that their projectors were succumbing, one by one, to the death-dealing rays our people had left trained on their planet. Rising, I made for the nearest world which would support human life—Earth. It was a good two hours' journey, and I noted with alarm that I only had a small supply of concentrated air in my tank—enough to last me about forty-five minutes by using it judiciously.

Pressing my speed control lever to the highest notch, I rushed Earthward with super-meteoric swiftness. Forty-five minutes passed, and still the Earth, although looming big ahead of me, was many thousands of miles away. Glancing at the indicator on my air tank, I saw that it registered zero. I closed my foul air escape valves, and breathed as lightly as possible. Presently I felt a deadly lethargy creeping over me. By exerting my will power to the utmost I managed to retain control of my senses for a few minutes longer.

Suddenly my waning consciousness registered the fact that my instruments showed I had nearly reached the outer limit of the Earth's atmosphere. To have entered it at the speed at which I was traveling would have meant a sudden, flaming death. Two things I managed to do before my senses fled—set my control lever at low speed, and unfasten the door beside me. Then came oblivion.

WHEN I regained consciousness I was lying on the earthen floor of a large, mud-walled hut. Standing around me was an awe-stricken group of light-skinned, half naked savages. I sat up, and as I did so, the earth shook beneath me and a portion of the mud wall collapsed, crushing three men and a woman. The remainder of the savages prostrated themselves around me with every indication of superstitious fear.

I signed that I was hungry, and food and drink were instantly brought me—a huge chunk of scorched meat and a white sour beverage which I afterward learned was the fermented milk of some animal. I ate and drank, and feeling stronger, arose and stepped out of the hut, walking as if my body had been weighted with lead because of the planet's tremendous gravitational pull. As I did so, the earth quivered once more, and the hut collapsed completely.

By signs, I finally made the terror-stricken savages understand that I wished to know the whereabouts of my ether ship. One of them, who appeared bolder than the rest, led me to a place where an enormous fissure yawned in the hard ground. Far down in this fissure I saw the craft wedged. I was casting about for some means of rescuing it, when the earth trembled, and the crack closed over it.

Thus cut off from interplanetary travel—for I did not know how to construct another ether ship—I found myself earthbound. I immediately set about learning the simple language of the savages, living in a dwelling of skins tied to light poles, because of the frequent earthquake shocks. These, as well as the many volcanic eruptions, terrific electrical storms, meteoric showers and electromagnetic displays from the polar regions, I knew were the results of the recent constant proximity of Magong to Earth, and that things would, in time, reach their proper balance once more. The savages, however, believed that the coming of "The great night light" and the subsequent terrifying phenomena, were due to some magic power which I possessed, and I was consequently worshiped as a god.

Propitiatory offerings of food, flocks, and animal skins poured in to me from neighboring tribes for hundreds of miles in all directions. Gradually the earthquake shocks subsided, the volcanic eruptions ceased to be continuous, the meteoric showers grew less frequent, and the elements less destructive. After a year had passed I married a daughter of the chief of the tribe among which I had fallen. Other chieftains, learning that the god married women, quickly tendered the hands of their daughters.

One of these, I married from time to time, thus making alliances with tribe after tribe which none might wish to break. I grew immensely wealthy, as the wealth of these people was reckoned, and built me an immense palace of hewn stone, personally supervising the work of my horde of unskilled laborers. I also built a temple for the worship of the great god, T'ien, Supreme Ruler of the Universe, and taught my people to worship Him, and to regard me only as His earthly vicar.

Most of my numerous wives bore me children, and I was grateful for the fact that all of them, instead of resembling their mothers' people, had the yellow skins, straight black hair, and slanting eyes of my race. My children grew up and married savage women and men, yet there was slight modification in the physiognomy of their offspring. As the years passed, I learned that these people, my children and descendants included, rarely lived longer than a century, their average life span being about seventy years. When I passed the century mark without showing any signs of senility, it was noised about that I was an immortal. This belief increased my power, and consequently I neither denied nor affirmed its truth, although I knew I should be middle-aged at two hundred and would probably be dead before I had traveled far in my third century of existence, as three centuries was the average life span for my race, and a total of four centuries rarely attained.

Having now reached my two hundred and ninety-eighth year, I am ready to return to my maker, leaving a hundred thousand descendants—a proud race who have long since ceased to intermarry with the white-skinned savages. They are known as the Celestial People, and I have made them lords over the lesser races of my mighty empire.

This record, which I have graven on age-defying stone with my own hands, will be sealed in the cave in which I am cutting it. I have calculated that, not less than five thousand years hence, the door of the cave will be revealed by erosion.

As the end approaches I feel the gift of prevision—the urge to prophesy. When my message is found, my descendants will be numbered by millions. They will not be scientists, but religionists. I see this tendency persisting in them, up to this day, and it will continue. Although I have taught them to read and write the language of my people, and to worship T'ien, I have long since abandoned the attempt to teach them science. My every effort to get them to grasp even the rudiments of astronomy and physics was unavailing. My simplest statements along these lines were interpreted as symbolic religious utterances and wound around superstitious beliefs.

The pure language of my forefathers, together with the characters I have taught them, is undergoing a grad-

ual change. It may be that, five thousand years hence, this writing will be unintelligible to my descendants. Time, however, should raise up a man among them, who will have the intelligence and the persistence necessary to decipher it. I picture him, however, as a studious man of religion, and therefore uninterested in its scientific aspects—and my scientific mind yearns to communicate with others of its kind—minds that will understand.

To my descendant, I therefore give this charge:

Translate this writing into the languages of the leading nations of Earth. Then journey hence, to a place where you will find a pit three-quarters of a mile in width and more than five hundred and fifty feet deep. It will be ringed about by a wall a hundred and fifty feet in height. My figures are approximate because they are only calculations, based on the size and speed of the meteoric mass which Mars projected to Earth.

Because it is unique on Earth, and exactly resembles the pits on my native planet, men of science who are interested in Magong will eventually visit it. When you have found it, you will secret yourself in the neighborhood and observe these men. Each time you see a true scientific visitor, watch the face of Magong for a sign. When a bright light appears, you will know that my soul has recognized the right person, and signaled you from its celestial abode.

Hand him a translation of this writing in his own language, and go about your own affairs with my blessing, for it is to him and to his kind that I, as a scientist, address this message.

And now, as I bring this, my life story to a close, I look back over a long, and fairly happy existence spent on Earth, yet each time I view Magong, I cannot help thinking of what might have been, had it not been for that horrible, man-made plague called war. Nor can I repress a feeling of sadness at sight of my once proud world among worlds, now a lowly satellite, her war-scarred, lifeless face forever turned sadly and submissively toward her new master, Earth.

THE END

Skylark Three

By Edward E. Smith, Ph.D.

(Continued from page 633)

"'Smatter? Cheer up, kids, you ain't seen nothing yet. That was just a couple of little preliminary love-taps, like two boxers kinda feeling each other out in the first ten seconds of the first round."

"Preliminary love-taps!" repeated Dorothy, looking into Seaton's eyes and being reassured by the serene confidence she read there. "But they hit us, and hurt us badly—why, there's a hole in our *Skylark* as big as a house, and it goes through four or five layers!"

"Yes, but we're not hurt a bit. They're easily fixed, and we've lost nothing but a few tons of inoson and uranium. We've got lots of spare metal. I don't know what I did to him, any more than he knows what he did to us, but I'll bet my other shirt that he knows he's been nudged!"

Repairs completed and the changes made in the method of projection, Seaton actuated the rapidly-shifting slit and peered through it at the enemy vessel. Finding their screens still up, he directed a complete-coverage attack upon them with four bars, while with the entire massed power of the remaining generators concentrated into one frequency, he shifted that frequency up and down the spectrum, probing, probing, ever probing with that gigantic beam of intolerable energy—feeling for some crack, however slight, into which he could insert that searing sheet of concentrated destruction. Although much of the available power of the Fenachrone was perforce devoted to repelling the continuous attack of the Terrestrials, they maintained an equally continuous offensive, and in spite of the narrowness of the open slit and the rapidity with which that slit was changing from frequency to frequency, enough of the frightful forces came through to keep the ultra-powered defensive screens radiating far into the violet—and, the utmost power of the refrigerating system proving absolutely useless against the concentrated beams being employed, mass after mass of inoson was literally blown from the outer and secondary skins of the *Skylark* by the comparatively tiny jets of force that leaked through the momentarily open slit from time to time, as exact synchronization was accidentally obtained.

Seaton, grimly watching his instruments, glanced at Crane, who, calm but watchful at his console, was repairing the damage as fast as it was done.

"They're sending more stuff, Mart, and it's getting hotter to handle. That means they're building more projectors. We can play that game, too. They're using up their fuel reserves fast; but we're bigger than they are, carry more metal, and it's more efficient metal, too. Only one way out of it, I guess—what say we put in enough generators to smother them down by brute force, no matter how much power it takes?"

"Why don't you use some of those awful copper shells? Or aren't we close enough yet?" Dorothy's low voice came clearly, so utterly silent was that frightful combat.

"Close! We're still better than two hundred thousand light-years apart! There may have been longer-range battles than this somewhere in the Universe, but I doubt it. And as for copper, even if we could get it to them, it'd be just like so many candy kisses compared to the stuff we're both using. Dear girl, there are fields of force extending for thousands of miles from each of these vessels beside which the exact center of the biggest lightning flash you ever saw would be a dead area!"

He set up a series of integrals and, machine after machine, in a space left vacant by the rapidly-vanishing store of uranium, there appeared inside the fourth skin

of the *Skylark* a row of gigantic generators, each one adding its hellish output to the already inconceivable stream of energy being directed at the foe. As that frightful flow increased by leaps and bounds, the intensity of the Fenachrone attack diminished, and finally it ceased altogether as every iota of the enemy's power became necessary for the maintenance of the defenses. Still greater grew the stream of force from the *Skylark*, and, now that the attack had ceased, Seaton opened the slit wider and stopped its shifting, in order still further to increase the efficiency of his terrible weapon. Face set in a fighting mask and eyes hard as gray iron, deeper and deeper he drove his now irresistible forces. His flying fingers were upon the keys of his console; his keen and merciless eyes were in a secondary projector near the now doomed ship of the Fenachrone, directing masterfully his terrible attack. As the output of his generators still increased, Seaton began to compress a searing hollow sphere of seething energy upon the furiously-straining defensive screens of the Fenachrone. Course after course of the heaviest possible screen was sent out, driven by massed batteries of copper now disintegrating at the rate of tons in every second, only to flare through the ultra-violet and to go down before that dreadful, that irresistible onslaught. Finally, as the inexorable sphere still contracted, the utmost efforts of the defenders could not keep their screens away from their own vessel, and simultaneously the prow and the stern of the Fenachrone cruiser was bared to that awful field of force, in which no possible substance could endure for even the most infinitesimal instant of time.

There was a sudden cessation of all resistance, and those Titanic forces, all directed inward, converged upon a point with a power behind which there was the inconceivable energy of four hundred thousand tons of uranium, being disintegrated at the highest possible rate, short of instant disruption. In that same instant of collapse, the enormous mass of power-copper in the Fenachrone cruiser and the vessel's every atom, alike of structure and contents, also exploded into pure energy at the touch of that unimaginable field of force.

In that awful moment before Seaton could shut off his power it seemed to him that space itself must be obliterated by the very concentration of the unknowable and incalculable forces there unleashed—must be swallowed up and lost in the utterly indescribable brilliance of the field of radiance driven to a distance of millions upon incandescent millions of miles from the place where the last representatives of the monstrous civilization of the Fenachrone had made their last stand against the forces of Universal Peace.

Epilogue

THE three-dimensional, moving, talking, almost living picture, being shown simultaneously in all the viewing areas throughout the innumerable planets of the Galaxy, faded out and the image of an aged, white-bearded Norlaminian appeared and spoke in the Galactic language.

"As is customary, the showing of this picture has opened the celebration of our great Galactic holiday, Civilization Day. As you all know, it portrays the events leading up to and making possible the formation of the League of Civilization by a mere handful of planets. The League now embraces all of this, the First Galaxy, and is spreading rapidly throughout the Universe. Varied are the physical forms and varied are the mentalities of our almost innumerable races of beings, but in Civilization we are becoming one, since those backward people who will not co-operate with us are rendered impotent to impede our progress among the more enlightened.

"It is peculiarly fitting that the one who has just been chosen to head the Galactic Council—the first person of a race other than one of those of the Central System to prove himself able to wield justly the vast powers of that office—should be a direct descendant of two of the revered persons whose deeds of olden times we have just witnessed.

"I present to you my successor as Chief of the Galactic Council, Richard Ballinger Seaton, the fourteen hundred sixty-ninth, of Earth."

THE END

The Man Who Saw the Future

By Edmond Hamilton

(*Continued from page* 605)

IT was a week later that they burned Henri Lothiere. Jean de Marselait, lifting his gaze from his endless parchment accusations and examens on that afternoon, looked out through the window at the stone room's end and saw a thick curl of black smoke going up into the blue heavens from the distant square. There came dimly to his ears the thunderous shouting of the crowd there.

He rested for a moment thoughtful, his pen upon his chin. "Strange, that one," he mused. "A sorcerer, of course, but such a one as I had never heard before."

His eyes went out again to the thick black smoke, and a thought came to him. "I wonder," he half-whispered, "was there any truth in that wild tale of his? The future—who can say—what men might do——?"

There was silence in the room as he brooded for a moment, and then he shook himself as one ridding himself of absurd speculations. "But tush—enough of these crazy fancies. They will have me for a sorcerer if I yield to these wild fancies and visions *of the futiere*."

And bending again with his pen to the parchment before him, he went gravely on with his work.

THE END

Written in the Year 2100

By Charles Ward

THERE is a new philosophy which holds that man's dream of a superman is but a dream. It is against this new and spreading notion that this brief synopsis of a century's progress is aimed. That our progress will continue is assured, even though we may never again experience a Great Change to add to the momentum of our advance.

When John David Andrews, as respectable and hard-headed a citizen as the twentieth century produced, offered a half-million dollars reward, and another half-million for expenses, to be given to the man who should rid the world of infectious diseases, he did so in a blind effort to strike back at the disease which had robbed him of his wife and his three children within a period of seven days. There was, of course, not the slightest chance of a good solution to the problem being offered. Naturally, many ingenious remedies were presented, none of which passed the board of medical specialists which Andrews had gathered to act as judges. In fact, of the thousand or two suggestions offered, only one was even considered, and that, rather hesitatingly, was given a second thought only because the man who offered it was a man of science, known to all readers of the Sunday supplement.

His suggestion was that the atmosphere be rendered sterile of bacterial life. Water-purifying systems were everywhere in use, so that the air could be considered almost the sole means for transmission of infectious diseases. Disease germs, he pointed out, rode in the atmospheric dust and were carried with it to every exposed part of the globe. Eliminate the dust, and the germs would no longer travel. It was his plan to rid the air of this colloidally suspended dust by a means of his own.

This suggestion was received with more than a little doubt by men who understood only too well how hard it could be to drive a substance in the colloidal state out of suspension.

For the benefit of those unfamiliar with the term, a colloidally suspended substance is one which is so finely divided that it will float in a fluid or gaseous medium. Thus, gold may become and does become so finely divided that it will be dispersed through sea-water and can only be removed with an infinite amount of trouble and expense. In a similar manner, dust can become so finely divided that the atmosphere will carry it. These particles of dust cannot be seen under the microscope because of their small size, but their presence is easily detected in the air when a beam of light enters a dark room.

It may be seen from this that Arthur Scott, professor of chemistry in a one-building Ohio college, had made an ambitious statement when he asserted that he could remove from the atmosphere the thousands of particles of dust per cubic centimeter which floated freely about. True, colloidally suspended soil in fresh water could be caused to settle by the addition of common table salt, as was demonstrated by the way the Mississippi dropped her soil to form deltas when the earth-bearing water met the salt ocean water. But, did such a method exist for removing dust from the air? Arthur Scott believed so.

When he appeared before the assembled medical men to state his case more clearly than he had been able to do by letter, Professor Scott proved to be anything but the popular conception of what a man of science should look like. Rather, he proved to be a stocky, bald-headed man of forty or more, who was instantly liked because of his ingenuous smile and his back-slapping ability. In fine, he was the sort of scientist who is at his best in a lecture hall and who prefers to make his private experiments of a sensational nature. Thus, he could skilfully present the dazzling surface of science to his students and help them on the path to the greater depths which he himself had not plumbed. On the present occasion his lecture hall ability captivated the great physicians who quite pardonably knew little of any branch of science save their own.

Where his skill as a lecturer might have failed to engage the confidence of the committee, his single experiment won the day. The experiment itself was quite simple. Any genuine biologist knows that if a sterile agar culture is exposed to the air for a few seconds and then sealed again, it will be supporting colonies of bacteria in twenty-four to thirty-six hours, under favorable conditions. What Scott did was to put a small amount of the sterile agar preparation, sealed in a covered glass dish, into an air-tight glass bell jar along with a clock-work device for crushing the covering of the dish. Next he injected, through a gas-cock, a minute quantity of gas from a steel cylinder, which he handled with extreme care.

"This gas, gentlemen," he said, "is a second cousin to the mustard gas used during the World War. In fact, it can scarcely be called that, for in its preparation I used unusual methods with unusual results. In formula, the two gases are almost identical, save that I have replaced the sulphur atom with an atom of tellurium, forming a hitherto unknown gas which I have not yet named.

"In my experiments, I noticed that the gas went into solution with the air and precipitated or displaced the colloidally-suspended dust exactly as salt added to water will cause colloidal soil to settle. Only the most minute quantity imaginable is necessary, which is fortunate in view of the intensely poisonous nature of the gas. There, the glass has been shattered and the culture is exposed to air which is free of dust and in consequence sterile of bacterial life."

With a few remarks, followed by questions from the committee, the meeting broke up, to meet again the next

day to determine whether or not the culture had remained as sterile as the Professor had claimed it would.

The meeting next day brought satisfactory evidence of the efficiency of Professor Scott's new gas, for the agar culture was as sterile of life as (quoting Scott) "the hide of a lap dog."

Contracts were signed on the spot by Andrews and Scott, for Andrews had been present at both meetings and was completely overwhelmed by the Professor's fluency and his own awe of anything scientific.

Operations for the obtaining of all available tellurium and for the manufacture of the gas began within a week, and at the end of two months a steady supply of the gas was being "bottled" in unpretentious steel cylinders and shipped to various parts of the world, accompanied by specially instructed men who knew quite well the dreadful life-taking qualities of the new compound. While gas liberated in any one place would have become diffused through the entire atmosphere in time, Scott feared that such a procedure would lead to a dangerous, though temporary, percentage of the toxic gas being present in the atmosphere near the point of liberation.

At the end of seven months a sufficient amount of the gas had been prepared at a cost many times the intended half-million, but still the cost was slight when one considered the tremendous work for humanity which was going on. As yet, the general public had been kept in the dark regarding this gigantic experiment of which it was the object, for both Andrews and Scott were agreed that publicity might do harm—before the work was finished. There is little doubt, though, that both men licked their mental lips at the thought of the limelight which they were soon to share.

As such days must, the Great Day finally arrived—quite reluctantly, it seemed to the scientist and the philanthropist—and as the day progressed, there was a sharp but not very loud hissing at various uninhabited places on the globe as millions of cubic feet of gas escaped from confinement into an atmosphere swarming with dust and bacterial life. Then, in one place after another, the hissing died away and the attendants began to wireless headquarters—the dilapidated factory—of the completion of their tasks. In the factory office, Scott and Andrews sat and smoked and accepted each other's silence. Occasionally the wireless operator, a small, meek young man, slipped in with a message and slipped out again.

The last report came in at three minutes before seven o'clock in the evening, and as the wireless operator left the room for the last time he paused to peer through the crack he had left when he closed the door. Since it was a cloudy spring evening, he could only see two stolid, almost bulky silhouettes sitting before the double windows and thrown into dim relief against the darkening grey outside.

"Like two prophets, they are," thought the meek youngster, "waiting for their miracle to come to pass. If it doesn't they're fools; if it does, I think they will be greater men than the world ever saw before—greater mortal men, that is. Still, God isn't dead yet. . . ."

And he softly closed the door on a darkened room in which sat two men who seemed to age with the hours as they waited to see their handiwork. Lonely they were not, for as they sat there in silence, each man seemed to lean a little against the other, to draw a bit closer spiritually, for such is friendship.

Toward midnight Scott spoke, as he lit a cigar: "Notice how the clouds've gone?"

The other man's cigar glowed redly before he replied. "I did, and I noticed how big the stars were. That an accident or did we do it?"

A full inch of Scott's cigar vanished before he answered.

"Do you know, just now you started me thinking of what *all* the consequences of our experiment will be, and when I recall them—yes, and consider them—I feel almost like praying for failure."

"The consequence as bad as that?"

"Some of the consequences will be amusing, some terrible—we've overshot our mark!"

Part of his lethargy was slipping from him.

"Man! It sounds idiotic, but we, today, have created a new race; or killed one. Why? Why, when the full force of the change is felt, man will be in a totally new environment! Well, *we*—we have changed man's whole environment! In a dozen generations, if the race still exists, our civilization will be as dead as you and I—"

As night drifted across the North American continent, the first effect of the Great Change made itself apparent to the astronomers, for that group of men were literally seeing things as they had never seen them before, and during the first night of unprecedented clearness, three new stars were discovered, which before had been quite invisible.

Next day, the first editions of the American newspapers gave moderate headlines to the astronomical discoveries and commented upon the unique dawn which, instead of coming on gradually, had appeared suddenly, and twenty minutes late at that. The sun simply appeared, and that was all. Before it appeared, all was dark and after it appeared all was light—save in the shadows. That was curious, too, for in the shadows the darkness was nearly absolute, while in the direct path of the light the sun was nearly white and much stronger than usual.

Afternoon and evening editions of the papers, however, forgot all about astronomy and shadows in their astonishment at the unheard of manner in which it was raining. New York, with its early sunrise, was the first to tell America what was happening. The rain began its antics during the rush hour by drenching everyone and everything in the streets. Water *gathered* on buildings, sidewalks, people, everything, and yet at all times the sky was clear. Umbrellas and raincoats appeared, but the former were useless in view of the fact that the rain was not falling but simply adhering to or gathering on all solid surfaces. The raincoats, too, did little good because water gathered on both the outside and the inside of them. In fact, heated, enclosed spaces, such as buildings, were the only refuges which were not dripping with water, because the heat modified the water-holding capacity of the air, raising the precipitating-point indoors above that outdoors. Yes, the papers had much to say and for once the Weather Bureau was given its choice of the amount of space it wanted on the front page, providing it would explain what had happened and tell what was to be expected.

By the next day, the scientific world was telling the lay world what was wrong. In fact, every scientist added his bit in an effort to clear up the mystery, but no headway was made for a week, at the end of which

(*Continued on page 671*)

Radio Mechanic and Inspector $1800 to $4000 a Year

The only course in Radio sponsored by RCA

LET THIS SHORT-CUT HELP YOU INTO

SUCCESS *in* RADIO

Broadcast Operator $1800 to $4000 a Year

Land Station Operator $1800 to $4000 a Year

Broadcast Station Mechanic $1800 to $3600 a Year

THOUSANDS of men are making good money at Radio—and so can you!

Commercial training is all you need to give you the professional confidence and ability. You can secure this training in your spare time . . . through a marvelous home-laboratory course sponsored by the Radio Corporation of America. Our big FREE Radio book tells all about it.

Round out your knowledge with this home-laboratory training

Put the finishing touch to your Radio experience. Get the "How" as well as the "Why" of Radio with this commercial training. Only an hour or so a day—in spare time—is all you need. As part of your course, you receive absolutely free of extra charge—a magnificent outlay of fine apparatus. With this outfit you learn to build fine sets and solve the radio problems that bring good pay. You acquire not only the ability but the confidence to succeed in a real commercial way.

Training backed by Radio Corporation of America

Our graduates are in demand everywhere. They enjoy greater success because they're posted right up-to-the-minute in *everything* in Radio. Radio's progress each year is measured by the accomplishment of the great engineers at work in the research laboratories of Radio Corporation of America. This Radio organization sets the standards for the industry.

Money back if not satisfied

The lessons prepare you for success in all phases of Radio—manufacturing, servicing, selling, ship and shore broadcasting and all types of Radio equipment. A signed agreement backed by RCA assures you of complete satisfaction upon completion of the training—or your money will be promptly refunded.

Read this thrilling free book

It may mean the turning point in your life. It gives you the real "dope" about Radio and it describes in detail the famous training that has enabled us to place thousands of our students in fine positions, usually from 3 to 10 days after graduation! It tells in 40 fascinating pages and photos all about Radio's brilliant opportunities for adventure and success. Mail the coupon now—the book is absolutely free! RCA Institutes, Inc., 75 Varick Street, New York, N. Y.

RCA

RCA INSTITUTES INC.

(A Division of Radio Corporation of America)

RCA INSTITUTES, Inc., Dept. EXP-10
75 Varick Street, New York, N. Y.

Gentlemen: Please send me your big free 40-page book which tells about the great opportunities in radio and about your famous laboratory method of radio instruction at home.

Name.....

Address.....

.....

Occupation.....

EXP-10

FREE To introduce the latest Hollywood Fad we offer a beautiful album artistically bound in a handsome gold-embossed cover—absolutely FREE OF CHARGE to anyone sending in an order at once for a set of twenty cabinet size autographed portraits of the most famous motion picture stars.

GET RIGHT IN ON THIS EXCITING HOLLYWOOD FAD. Just pin a single dollar bill to this coupon. DO IT NOW!

STAR AND STUDIO PICTURE CORPORATION
27 W. 20th St.
Department—A-10—New York, N. Y.

Gentlemen: Enclosed please find One Dollar ($1.00) for a set of 20 portraits Post Paid and one album. It is understood that the album is sent to me absolutely free of charge.

Name .....

Address .....
(Print Plainly)

Your money cheerfully refunded if not absolutely satisfied. Reference: Mechanics National Bank, Bayonne, New Jersey. Send stamps, check, money order, or dollar with order.

LAW STUDY AT HOME

Become a lawyer. Legally trained men win high positions and big success in business and public life. Be independent. Greater opportunities now than ever before. Big corporations are headed by men with legal training. Law-trained men earn $5,000 to $10,000 Annually

We guide you step by step. You can train at home during spare time. Degree of LL. B. conferred. Successful graduates in every section of U. S. We furnish all text material, including fourteen-volume Law Library. Low cost, easy terms. Get our valuable 64-page "Law Guide" and "Evidence" books FREE. Send for them NOW.

LaSalle Extension University, Dept. 1046-L Chicago
The World's Largest Business Training Institution

WORLD-WIDE SHORT WAVE RECEIVER

ONLY $6.45

Span the World with this Set!

A new radio thrill for you! Listen in DIRECT to London, Paris, Berlin, Buenos Aires and other broadcasting stations throughout the world via short waves. Enjoy unique foreign programs from strange lands. Your ordinary receiver cannot tune in these low wave stations. WORLD-WIDE RECEIVER gets 14 to 550 meter stations with surprising clarity. SEND NO MONEY! Just write your name and address on a postcard and ask us to send you this wonderful guaranteed short wave set. Pay postman $6.45 plus a small delivery charge. All orders West of Rockies must be accompanied by $1.00 deposit. Foreign countries must remit in full. Write today!

CHAS. HOODWIN CO.
4240 Lincoln Ave., Dept. K-30, CHICAGO

DISCUSSIONS—

In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

A CRITICISM OF DR. BREUER'S STORY "THE HUNGRY GUINEA PIG," AND A COMMUNICATION FROM DR. BREUER

Editor, AMAZING STORIES:

Looking back over the magazine for May, I notice a terrifying error by Dr. Breuer. Terrifying, I mean, because if *he* makes such in a matter of biology, what are the rest of us likely to do?

I refer to his discussion on the horse increased twice in size. He says that a horse doubled in size would be eight times the weight. Correct. But he says that it would have only twice the muscle power, which is wrong. The muscle cross section increases as the square of its diameter, so the horse would be four times as strong with eight times the weight, and needs his muscle area doubled; the diameter of his muscles should be multiplied by the square root of two instead of two. That would increase a three-inch muscle to about 4.2 inches instead of six. It will be interesting to try to get at how large a human being could get with his proportions unchanged. From general experience it appears that trained muscular fibre is good for about ten times the stress it normally gets. Bone is good for more yet, except when subject to flexural stress.

Then a man eighteen feet tall would be 27 times as heavy as a normal man, and nine times as strong; and would still have a factor of safety of three to go on. With trained muscles, he would feel like an ordinary man fat enough to weigh 450 pounds, with untrained muscles, like a diver in his suit on dry land. Taking a man thirty feet tall, he would be 125 times as heavy as normal, and 25 times as strong. If he is to move about like an ordinary man, his muscle diameter will have to be multiplied by the square root of five, about 2.2. He would be a bulgy but still recognizable human being.

It is conceivable that without the increased proportion, but with muscles accustomed to the extra burden from birth, he could still navigate quite well; as Dr. Breuer says, no one knows the real possibilities of muscular tissue. I think all this throws some light on the past existence of giant animals—or perhaps giant men, they being so universal in tradition.

With a not unreasonable proportional increase of tissue, men fifty feet high could live, and move, and have their being—albeit perhaps not a very active one. Of course, such a being as the "Nth Man" who was described in a story some time ago—a man miles high—would be impossible under the present laws of nature. His flesh would tear loose from the bones of its own weight.

But even so, there was once such a being as the 'kangaroo dinosaur," the gorgosaur, thirty feet long and which seems to have capered over the country in fifty foot bounds. The size of some of these animals does not seem to explain their feats. I submit the possibility that, since the Universe is constantly kinetic, in evolution in all its parts, including matter itself, the "laws of nature" may not themselves be static; the gravitational constant, among many other things considered permanent, might be in a state of change—slow, but definite over aeons. Anyway, it's worth thinking about.

Victor A. Endersby,
1942 Canon Drive,
Montrose, Calif.

(Dr. Breuer answers Mr. Endersby's letter himself, as follows: "Mr. Endersby's argument sounds correct to me, and so do the mathematics. I do not remember just how I wrote my own remarks, and have no records of them nor any copy of the published letter, which I admit much to my regret.

"According to Mr. Endersby, therefore, I must have made an error. But it was an error, not in biology, but in mathematics.

"As a matter of fact my error succeeded in making my argument give a much more conservative conclusion than is actually the truth. With Mr. Endersby's correction, for which I am duly grateful, my line of argument acquires much more force than it had in the first place. His correction merely straightens out the mathematics, it does not affect the biology; but it certainly strengthens my original thesis.

"Therefore, I feel that you need have no hesitation in publishing stories of huge animals. Their possibility seems well established."—We beg to offer our thanks to Dr. Breuer for his answer to Mr. Endersby's letter.—EDITOR.)

HARL VINCENT ANSWERS, VERY FULLY, ONE OF HIS CRITICS

Editor, AMAZING STORIES:

In the August issue of AMAZING STORIES you published a letter from Miss (?) Barbara Baldwin commenting on the astronomy in my story, "Venus Liberated," as regards the stability of the hypothetical satellite of Venus which I called Kellos. This letter is impressive in that it shows the interest along scientific lines aroused by the type of fiction published in "our" magazine, but the correspondent has overlooked one extremely important factor in arriving at her deduction that the satellite would be unstable as described.

As an illustration of the method of computation used by your correspondent we may consider the stability of the satellite nearest to the planet Jupiter. This has not been named and is merely designated as satellite V. Its distance from the center of Jupiter is 112,500 miles, whereas the planet itself is 483 million miles from the sun, or 4,000 times the distance to the satellite. Conditions are reversed in this case since the mass of the sun is only about 1,050 times that of Jupiter. However, if correct, the same method might be used in figuring the relative attraction and we might say that the attraction of Jupiter for the satellite is 4,000 squared, divided by 1,050, or approximately 40,000 times that of the sun for the satellite.

Why then, does not the satellite fall into the mother planet?

The answer is centrifugal force, which your correspondent has not considered. Every particle in a rotating object has a tendency to fly out from the center of rotation and, as satellite V revolves about Jupiter at very high speed—making one complete revolution in 11 hours 57 minutes—the centrifugal force is sufficient to counterbalance the tremendous gravity pull of the planet and keep it in its orbit.

The motion of a satellite with relation to the sun is, of course, a complicated one in that it revolves around a planet that is itself revolving around the sun. The motion is further complicated by the inclination of the satellite's orbit to that of the planet it follows. Were there no other planets in the solar system, there would be two major attractions counterbalanced by two centrifugal forces acting on the satellite. It is attracted by the mother planet and thrown out with equal force by its revolution about that planet. Likewise it is attracted by the sun and thrown out by the force due to its revolution around that body, following its mother planet, of course.

Were the earth stopped in its orbit, as suggested by your correspondent, not only would the moon be drawn into the sun, but the earth as well and with much greater force due to its greater mass.

Kellos, I believe, would be quite stable. The characteristics of its orbit, which were not given in the story and of course are not known—velocity, inclination and eccentricity—would be such as to counterbalance exactly all other forces tending to throw it form that orbit. In fact, were Venus to vanish entirely and suddenly by some miraculous means, Kellos still would not be drawn into the sun. It would continue to revolve around that great orb that is the center of our planetary system in a new orbit whose characteristics would be determined by its mass, distance, residual velocity and, to a lesser extent, by the attraction of other bodies in the system. Only if its velocity were entirely lost would it take the long plunge to the sun.

Harl Vincent,
New York City

A MATHEMATICAL RATING OF OUR STORIES AND AUTHORS. ROBOTS FOR SPACE FLYING. BODE'S LAW

Editor, AMAZING STORIES:

My judgment is certainly vindicated! The graphs I sent you showed a steady and consistent rise in quality of stories, and I predicted that you would reach a dead level of perfect on three stars for all stories.' You certainly have!

"Skylark Three" is, if anything, better than the first story. The only trouble I could find in it was mechanical—the wrong caption over the first illustration. How did that happen? Of the rest, "World Atavism" is probably the poorest, because it is the least probable, or the least plausibly written. After all, Hamilton must be something like J. S. Fletcher and Edgar Wallace, the strain of mass production is telling. I agree with others that his plots are standardized and his fundamental assumptions often scientifically unsound, but what always "gets me" is the manner in which he handles the consequence of those assumptions. From that angle he is a genius, from another he is an amateur. And he has interplanetary combat down to a science, or an art, with his formation flying. I wonder what his military experience has been. He may be monotonous at times, but he can always spring some new idea.

I think I will take up the cudgels in your defense in the matter of A. Merritt. I suppose I have really no special qualifications, except as a reader and Merritt fan, but even that is a lot. Many readers have complained that the promised sequel to "The Face in the Abyss" has not arrived. It is my impression that Mr. Merritt is one of the most careful writers of the present day, slow but sure, with the result that each story is a masterpiece. Also, I do not think he has ever before done a sequel to one of his stories. He turns out one story in a year or more, and must naturally seek the best market. They include most of the scientifiction fans and other readers as well. Many of their serials are published as books. So it is that "The Snake Mother" the promised sequel, will be, unfortunately, in "Argosy" rather than AMAZING STORIES next fall, but nevertheless, the honor of getting Mr. Merritt to write that sequel goes to AMAZING STORIES. I hope that will stop the sneers. One question: Is "The Metal Emperor" the same story as "The Metal Monster?" I hope not, for that will leave something of Mr. Merritt's to look forward to. Maybe, when I've made my million, I can call for an edition of A. Merritt with illustrations by Sime, of Dunsany fame—maybe.

Now for a theory or so. First, has it ever struck you that perfection of television and of radio control would make exploration of the nearer planets and of the deepest seas by a mechanical proxy, as already outlined in AMAZING STORIES more practicable than actual human travel? A machine could be made to stand for greater accelerations and pressures than a man, at the same time eliminating waste space, food, air apparatus, etc., in the rocket or diving bell, at least until the trip has been made often enough to ensure safe transport of a human being. Of course, at great distances, the time delay in transmitting signals would inhibit flexible control, but for the sea and moon, for subterranean borings, even for the nearer planets, it might prove workable. Then, there is the Heaviside layer. At any rate, it seems worthy of thought.

As a matter of interest to those who believe that Bode's "Law" will eventually be explained as other than an utterly arbitrary expression for placing the planets, may I point out that Pluto, the new planet, comes much closer to Bode's position for a ninth planet (including the asteroids) than does Neptune. Let us see what follows from that. You know that Pickering had predicted as many as four trans-Neptunian planets. Pluto has been definitely found. Canada may found another—at a distance that is practically the same as Pluto's! Apply the imagination to that!——

I see a little sun with nine planets, or eight planets and a ring of asteroids, carefully obeying Bode's Law. Out of space comes an alien invader, crashing into the solar system. The outermost planet is in its path, they swing round each other, the little ninth planet is torn by the tidal action of its great attacker until it splits, is rent into two, three, may be four small planets that follow highly eccentric orbits at much the same mean distance from the sun. And now the great invader is slowed and diverted by this combat, so that it swings into an orbit midway between the eighth and ninth planets, between Uranus and the Pluto group—the invading Neptune.

It Was the Greatest Shock of My Life to Hear Her Play

—How had she found time to practice?

"WELL, Jim, I told you I had a surprise for you!"

She beamed at her husband, delighted to see how surprised he was.

And I was astonished, too. Quite casually she had gone to the piano, sat down—and played! Played beautifully—though I had never seen her touch a piano before.

"How did you ever do it?" her husband asked. "When did you find time to practice?"

"And who is your teacher?" I added.

"Wait, wait!" she laughed. "One question at a time. I have no teacher, that is, no private teacher, and I do my practicing between dishes."

"No teacher?"

"No—I learned to play the piano an entirely *new* way—*without* a teacher. You see, all my life I wanted to play some musical instrument. I thought I'd never learn how to play, though—for I haven't much time to spare, and I thought it would take long hours of hard work. And I thought it would be expensive, too."

"Well, it *is* hard work, and it is expensive," I said. "Why, I have a sister—"

"I know," she laughed, "but *I* learned to play the piano through the new simplified method. Some time ago I saw an announcement of the U. S. School of Music. It told how a young man had learned to play the piano during his spare time without a teacher. I found that thousands of others had learned to play their favorite musical instruments this same easy way, and so I decided to enroll for a course in piano playing."

"But you didn't tell me anything about it," Jim said.

"Well, you see, that was my big surprise."

"If you planned to surprise me—you've certainly succeeded," said Jim.

Learn to Play at Home

This story is typical. Thousands of men and women have learned to play their favorite musical instruments through the U. S. School of Music.

Are you letting priceless moments slip by when you could be learning to play some musical instrument—easily, quickly?

You simply cannot go wrong. First, you are told how a thing is done, then by illustration and diagram you are *shown* how, and when you play—you *hear* it.

Thus you actually teach yourself to become an accomplished musician right in your own home. Without long hours of tedious practice. Without dull or uninteresting scales you learn how to play real music from real notes.

The U. S. School of Music will make you a *capable and efficient player*. Many of our pupils now have positions with professional bands and orchestras.

Demonstration Lesson FREE

Over half a million people have already taught themselves to play their favorite instruments right in their own home. To prove that you, too, can learn music this fascinating way, let us send you our Free Book, "Music Lessons in Your Own Home," which fully explains this remarkable method. We will include also our Free Demonstration Lesson.

Mail Coupon Today

If you really want to gain new happiness, and increase your popularity send off this coupon at once. Forget the old-fashioned idea that "talent" means everything. Decide which instrument you want to play, and the U. S. School of Music will do the rest. *At the average cost of only a few pennies a day!* Act NOW! Mail coupon today for the fascinating free book and Demonstration Lesson. Instruments supplied when needed, cash or credit.

U.S. School of Music, 20210 Brunswick Bldg., New York

Choose Your Course	
Piano	Hawaiian Guitar
Organ	Drums and Traps
Violin	Mandolin
Piccolo	Harmony and Composition
Clarinet	Sight Singing
Flute	Ukulele
Harp	Trombone
'Cello	Cornet
Guitar	Saxophone
Voice & Speech Culture	
Automatic Finger Control	
Piano Accordion	
Italian and German Accordion	
Banjo (Plectrum, 5-String or Tenor)	

U. S. School of Music,
20210 Brunswick Bldg., New York City

Please send me your free book "Music Lessons in Your Own Home," with introduction by Dr. Frank Crane, Free Demonstration Lesson and particulars of your easy payment plan. I am interested in the following course:

Have you
.....Instrument? .....

Name.....
(Please write plainly)

Address.....

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

✓FREE BOOKS of BUSINESS HELPS

We publish over 200 Home Study Books, each a complete treatise of its subject. We have one or more for you. Books on

☐ Commercial Art	☐ Decoration
☐ Lettering	☐ Automobiles
☐ Advertising	☐ Battery Work
☐ Sign Making	☐ Electricity
☐ Radio	☐ Carpentry
☐ Aviation	☐ Building
☐ Painting	☐ Contracting
☐ Silk Screen Process	☐ Sheet Metal Work

and many other subjects. All fully described in our FREE CATALOG. Check the subjects in which you are interested and write today.

FREDERICK J. DRAKE & CO., Publishers
Room 150—179 No. Michigan Blvd., Chicago
Drake books are for sale in all book stores

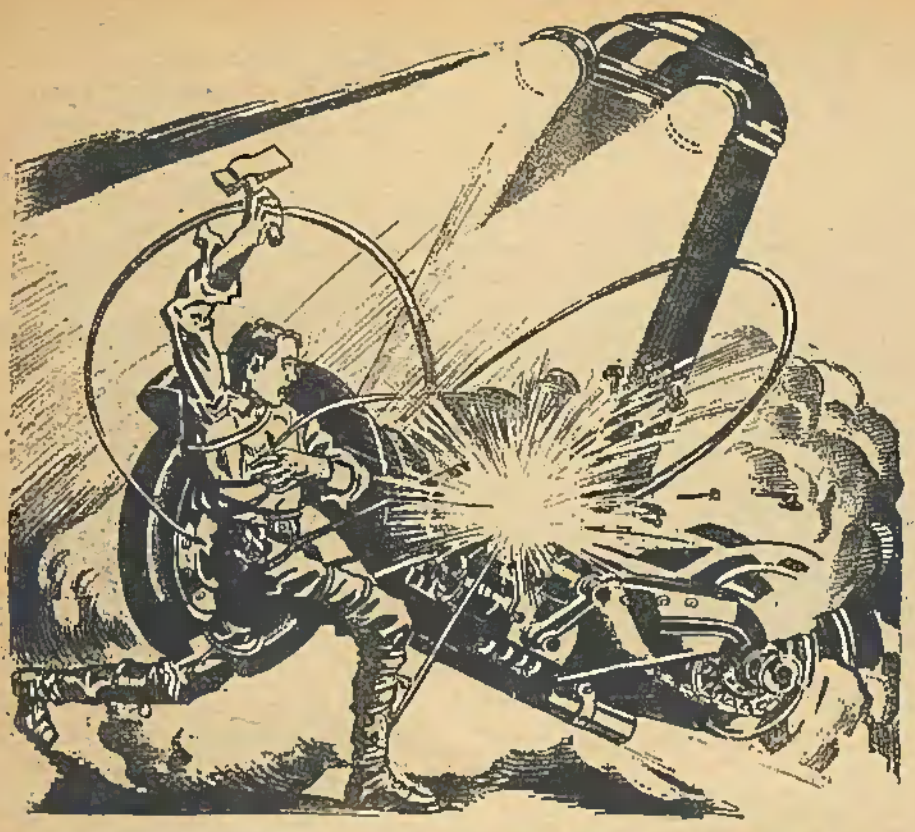
Fascinating-Profitable
LEARN TELEGRAPHY This Easy Way—

CARNEGIE—world-famous ex-telegrapher

Thomas A. Edison—Andrew Carnegie—most of the presidents of railroads and other world leaders got their start as Telegraphers.
Today—on land—sea—in the air, men who know the code are commanding big money—in the world's most fascinating profession.
Learn At Home—with TELEPLEX—the Master Teacher. *Write for Folder B-10.*

Teleplex Co.
76 Cortlandt St., New York

Teleplex



Thought Machine Masters Man!

"PARADISE AND IRON"

By Miles J. Breuer, M.D.

The big Summer AMAZING STORIES QUARTERLY is crowded with thrills and treats—first and foremost of which is this astounding full-length scientifiction novel. A scientist invents an ingenious thought machine which perfects itself, and which, with Frankenstein ruthlessness, threatens to destroy the industrial paradise it has created and rules.

"THE VOICE OF THE VOID"

By John W. Campbell, Jr.

A complete interplanetary novelette by the author of "Piracy Preferred," "When the Atoms Failed," and "The Metal Horde."

"THE PRINCESS OF ARELLI"

By Aladra Septama

A complete novelette of the strange life on the moon, by the famous author of "The Beast Men of Ceres," its sequel, "The Cry from the Ether," and "The Dragons of Space."

"MONSTERS OF THE RAY"

By A. Hyatt Verrill

A complete scientifiction novelette combined with an archæological treatise. An amazing invention in the form of a certain ray reproduces actual living monsters and beings of Pre-Incans — scenes that are stored in the light rays that visited the earth thousands of years ago!

Thrill to these 4 Big Stories and Other Features -- All in the Summer

ONLY 50c

AMAZING STORIES *Quarterly*

ONLY 50c

Buy It NOW—On All Newsstands

The facts are there. Pluto fits Bode's Law better than Neptune, and has, apparently an eccentric orbit. Calculation shows other, similar planets near Pluto; observation places one of them at the same distance from the sun. If we accept the theory of planetary birth, which pictures a great cigar-shaped plume of matter drawn from the sun by a passing star, a plume which condenses into the planets thickest at Jupiter, pointed at Mercury and beyond Uranus, with density decreasing with distance from the sun—we see that Neptune should be considerably smaller than Uranus. It is actually nine per cent larger. It has a moon which is very large, possibly a captured fragment of an outer planet. So, why not?

Of course, there is no actual need for such a hypothesis. Bode's Law is no actual scientific statement, merely an arbitrary statement so far as we know. Neptune's density is in the right relation to Uranus, more so than to Saturn. There is no accurate data on Pluto's eccentricity, or the orbits of other trans-Neptunian planets. It is just an idea—the sort to make stories from, but it's interesting. What do you think of it?

P. S. Miller,
302 S. Ten Broeck St.,
Scotia, New York.

(Work upon rocket flying as it may be termed is increasing. It is understood that it is being financially backed to a large degree and more will undoubtedly be heard about it in the near future in the line of rocket propulsion through the air and perhaps almost beyond it. What you say is perfectly true, that a machine could stand greater extremes of acceleration and pressure than a man could endure. Professor Goddard's work in rocket propulsion will be watched with great interest by everybody. We agree with you that Bode's Law is very arbitrary, yet the number of proofs of its truth may be figured out by counting the planets which obey it. There is a great deal in astronomy that seems to touch upon the hypothetical, and it is probable that in no branch of science does the imagination play so large a part as in the science of the world of the heavens. We hope that your very interesting letter will elicit others from some of our astronomically disposed readers.—EDITOR.)

AN APPRECIATION OF SOME OF OUR AUTHORS. THE ASTEROID BELT IN INTERPLANETARY TRAVEL

Editor, AMAZING STORIES:

This is the first time I have ever written to a magazine and don't exactly know what to say. Dr. Keller, to our science class, is your best author, A. Hyatt Verrill and Harl Vincent close seconds. As editor of the science class paper at our school I have been able to get a vote on the authors and these three stand the highest, Dr. Keller with 53 votes out of 111.

Now for a brief summary of the stories in the August issue: "Skylark Three" so far is a very good story; wish I could have read "The Skylark of Space." "The Mystery of Professor Brown," fine for a short story. "South Polar Berryllium Limited," good. "World Atavism," very good. "The Last War," up to the author's standard. "When Inca-Land Revolted," didn't like very well, but as a whole I think this issue was the best you have put out.

Your artists are good, especially Wesso, but how come Paul has been drawing for the last two issues? The cover work is fine.

The best stories I have read in your magazine so far are: "The Terror of the Streets," "After 12,000 Years," "Paradox," and its sequel; "White Lily," "When the Atoms Failed" and "Microcosmic Buccaneers."

Now I want to ask a question. If a space ship was flying to Jupiter, couldn't it avoid the asteroid belt by going over or under it?

I hope the waste basket is out on a trip to Pluto when this letter gets in. See you on the moon in 1960.

Harold Jones,
1603 Sixth Ave.,
Des Moines, Iowa.

(It is interesting to get a letter from an editor of a science class paper in a high school. The competition about the authors in AMAZING STORIES must have been quite interesting. Our sister paper S. & I., gives a number of comic drawings and humorous touches in the line of science. We feel that our space is too limited for us to go into anything new. The asteroid belt could be avoided as you suggest, but our writers on interplanetary travel seem to like it.—EDITOR.)

"SKYLARK THREE" COMMENDED. REMARKS ON OUR ARTISTS

Editor, AMAZING STORIES:

I have just finished the first part of "Skylark Three" and I think it is great, but now I would like to read "The Skylark of Space." I wish you would please tell me where I can obtain copies of AMAZING STORIES with this story in them.

I certainly am sorry to see Paul's illustrations return to AMAZING STORIES' pages. The people he draws have heads too large for their bodies, and look too much like statues. Wesso has some fine covers and story illustrations, and is by far the most competent artist on your staff. Morey would not be so bad if he paid a little more attention to details, such as a five-masted sailer steaming along without any masts. (On the June issue cover.)

I recently received my book of "Short Stories of H. G. Wells," and was more than pleased with it. It certainly is a fine book.

J. L. Bianchi,
107 N. Wheeler St.,
Victoria, Texas.

(It is rather difficult to get back numbers of AMAZING STORIES. There are several which we were in search of for our own files and have had a hard time getting them. We will try to put you in the way of communicating with some of our readers who have back numbers for sale. The original "Skylark of Space" appeared in our issues of August, September, and October, 1928.

Personally we feel about our artists Morey, Paul and Wesso that one is about as good as the other and if you will follow up the work of artists on the magazine you will find that sometimes they hit the mark far better than they do at other times.

The Five-Masted Sailer that you refer to was certainly the subject of a mistake for which we apologized in a previous issue.—EDITOR.)

A RÉSUMÉ OF AUTHORS. SOME KINDS OF STORIES OBJECTED TO. AN ARDENT READER OF A. S.

Editor, AMAZING STORIES:

Having recently finished the July AMAZING STORIES and at the same time that story of stories, "The Universe Wreckers," I have a few comments to make on the best magazine I have ever read. First I should like to list the stories I have liked best.

1. "The Moon Pool," a story which in all its bizarrness has something tangibly human in it. Undoubtedly the best I have ever read. 2. "Ralph 124C 41 +," an excellent story of interplanetary travel. 3. "Around the Universe," one of the best on interstellar travel. 4. "The Skylark of Space," good on the science of space flying. 5. "When the Sleeper Wakes," an excellent story of the scientific development of the future. 6. "The Universe Wreckers," undoubtedly unsurpassed in the realm of scientifiction as an interplanetary story. 7. "The Master Mind of Mars," Burroughs's best on the mysteries of the Red Planet. 8. "Tani of Ekkis," the best of Mr. Septama's works. 9. All of Dr. Breuer's. 10. All of Aladra Septama's. 11. All of Dr. Keller's. 12. All of Mr. Hamilton's.

A few of the stories I object to are devoted to the type of the super-crook who wants to conquer the world. However, I have not seen so many of this class in AMAZING STORIES as in others of the same line.

Your artists, Wesso and Morey, are excellent. An artist who can portray an object of the imagination, one which he has never seen, much less heard of, must be good.

I have read somewhere of a planet with an atmosphere of chlorine! This does not seem beyond the realm of possibility, as chlorine is a supporter of combustion, as shown by dropping powdered antimony into it.

Now that the new planet, Pluto has been discovered, a good field for stories has been found.

Although I am only 16 years old, I am an ardent AMAZING STORIES reader, and I enjoy reading "our" magazine very much.

George Skora,
P. O. Box 6,
Tucson, Ariz.

(Your very acceptable letter speaks for itself and tells its own story. We are certainly not making any feature of super-crook stories, though some which might be given that title have appeared in our columns, but there is a touch of science always in them and that, we take it, redeems them from the objection implied in your letter. The Editors of this magazine are in a peculiar position; there is a constant effort on their part, to definitely have natural science, physics, chemistry and the like play a part in developing the plot of the story. But our readers have no idea how hard it is to keep our authors within this restriction. It is not that science is to be incidentally mentioned in this story, but it should play a definite part in carrying out the plot. The Questionnaire, which we have been giving in our issues, is much appreciated by many of our readers and it tells the story of how science is scattered through the text of AMAZING STORIES. The Editors sometimes wish that there was more science in each story, but a limitation comes in to the effect that the stories must not be dry; they must not read like textbooks, but like true narrations. They are not held down to the "unities" of the modern short story, however, and are not to be judged by the canons of short story writing, which are now brought into such prominence.—EDITOR.)

A LETTER ABOUT THE SCOPE OF SCIENCE-FICTION FROM A WELL KNOWN AUTHOR

Editor, AMAZING STORIES:

Since "Madness of the Dust" was printed in AMAZING STORIES I received letters from a couple of candid friends with whom I have had correspondence some time ago. Believing that their reactions are probably shared by a good many readers of AMAZING STORIES I am answering them in this letter to you, contingent on your belief that this letter will be of enough interest to merit the space.

"Traitor to Scientifiction" Ed Love of Grand Forks, B. C., good-naturedly calls me. "You know very well," he says, "that your yarn is nothing but a hodge-podge of cheap sensationalism. You deliberately appeal to the emotions rather than to the minds of your readers. You present a story of ordinary human loves and hates and behaviors, such as one can read in dozens of magazines on the newsstands. Then you slap on a little paint—a little talk about space ships, or Martians, to give it the glamor of interplanetary travel. It is evident that you write for the herd who wish to be entertained, rather than that small but distinguished group that places mental attainments first."

Now that is quite an indictment, and I admit that in the half-dozen stories I wrote last fall (Haven't had time to write any since then) I paid particular attention to putting in the emotional values, which are demanded by most magazines other than the purely scientific ones. This need not necessarily be called cheap sensationalism, but merely a change of mental diet. There are plenty of good stories being printed right along that have all the science one could ask. Hence there was no justification for myself entering into a field where so many excellent stories were already being produced.

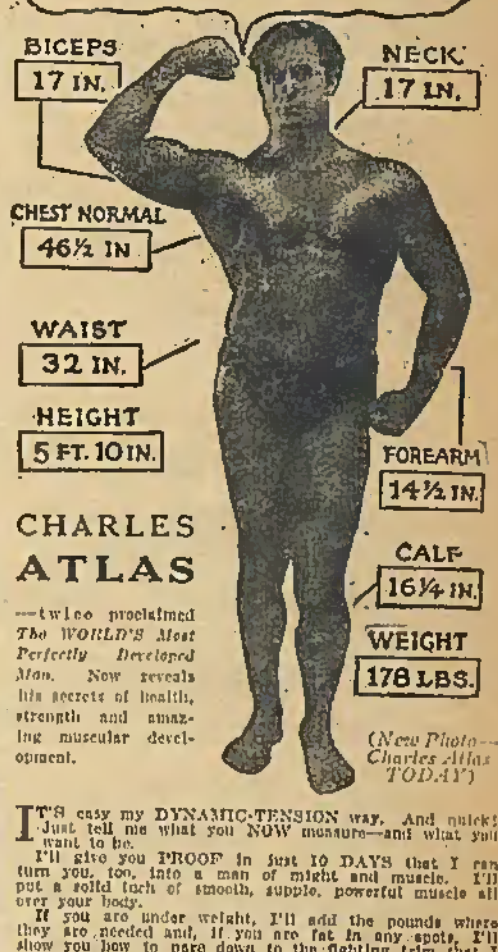
For this reason I stressed the human interest, romance and adventure element. This was a deliberate policy with the object of widening the science-fiction field. There are only about so many scientifiction fans able to appreciate the sometimes highly technical stories which can be truly called scientific. There is, however, a group of "marginal" possibilities that can be interested in scientific fiction, if their interest is held long enough by the emotional elements of a story to enable them to grasp whatever science it contains. I have no way of knowing whether "Madness of the Dust" made any converts for science fiction from the ranks of the non-scientific as yet, but before the first of August at least one of my stories written on the strength of this theory will have appeared in each one of the scientific or near-scientific magazines. By then some definite conclusion can no doubt be drawn.

There is also the likelihood that many scientifiction fans, who are well able to understand the most abstrusely scientific story, will enjoy at least one "lighter" story in an issue, which makes no great demand on the intellect and has an agreeable emotional effect. As an "old-timer" scientifiction fan, I can say for myself that a story, to please me, does not necessarily have to be "deep."

Allan Leonard, Carroll Place, Brunswick, N. J., was pleased with the story except that the hero should have made a good job of it and completely removed the appendix. That would have been a large order, however. Even skilled surgeons do not remove ruptured appendices at once, but drain them just as was done in this story. The details of the operation were supplied to me by a well known surgeon, and checked for errors, I understand, by Dr. Miles J. Breuer.

R. F. Starzl,
Le Mars, Iowa.

"Give me your measure and I'll PROVE that you can have a body like mine"



CHARLES ATLAS

—twice proclaimed *The WORLD'S Most Perfectly Developed Man.* Now reveals his secrets of health, strength and amazing muscular development.

(*New Photo—Charles Atlas TODAY*)

IT'S easy my DYNAMIC-TENSION way. And quick! Just tell me what you NOW measure—and what you want to be.

I'll give you PROOF in just 10 DAYS that I can turn you, too, into a man of might and muscle. I'll put a solid inch of smooth, supple, powerful muscle all over your body.

If you are under weight, I'll add the pounds where they are needed and, if you are fat in any spots, I'll show you how to pare down to the fighting trim that I am always in myself.

And with the big muscles and powerful, evenly-developed body that my method so quickly gives you, I'll also give you through-and-through health—health that digs down into your system and banishes such things as constipation, pimples, skin blotches and the hundred-and-one other ailments that rob you of the good times and the good things of life.

FREE! "Everlasting Health and Strength"

First, do what my other prize-winning followers did. Send for a free copy of my 48-page book—"Everlasting Health and Strength," by Charles Atlas. Gamble a 2c stamp for the biggest prize that anyone can gain—a handsome, healthy, muscular body that commands the respect of anybody, any time, any place!

With my book I'll send you a chart so you can give me all your measurements. Then compare your biceps with mine. Measure your chest and put the figures beside mine. Do the same with your legs, arms, neck, wrist and all other parts of your body. Then get the proof of what my secret of Dynamic-Tension will do for you—in your home—spending as little as 15 minutes a day doing what I tell you—without apparatus—without special foods, pills, or baths—without any kind of fussy contrivance whatsoever! Give me 10 days and I'll give you the proof!

Remember, it's easy my way. No apparatus—Dynamic-Tension does the work! You owe it to yourself to find out what my secret will do for you. Make sure of your free copy of my book—mail the coupon NOW. Address me personally—CHARLES ATLAS (Dept. 2310-A), 133 East 23rd St., New York City.

—MAIL THIS NOW!—

CHARLES ATLAS (Dept. 2310-A)
133 East 23rd St., New York City

Dear Mr. Atlas: I want the proof that your system of Dynamic-Tension will give me, too, a healthy, husky body and big muscle development. Send me your free book, *"Everlasting Health and Strength,"* and the confidential chart for my measurements.

Name .....

Address .....

City and State .....
(Please print or write PLAINLY)

EARN *BIG MONEY*

AS A FOOT SPECIALIST

Learn PEDOPRACTIC—the new system of correcting foot disorders and deformities without medicine or surgery that's making tremendous strides these days. It's a new uncrowded profession and offers amazing opportunities in an unlimited field. Dignified, interesting and profitable. No thinking man or woman will willingly neglect foot troubles when they produce so much discomfort and disability and can be so easily corrected.

LEARN QUICKLY AT HOME IN SPARE TIME!

With but ordinary education and leisure home study you can quickly qualify for this profession with its social, professional and financial advantages.

EARN WHILE YOU LEARN

The demand for your services will be so great that you can start in your own home and earn the cost of your training while you are studying the course. We teach you how to quickly "cash in" on your knowledge.

You can quickly build up a practice and have an office of your own. It's a wonderful opportunity so act quickly. Clip coupon below, sign your name and address, mail today for full information about this wonderful new science. Do it now. No obligation.

— — — — — CUT HERE — — — — —

AMERICAN COLLEGE
Chartered 1915 by the State of Illinois
Dept. P-10 54 W. Illinois St., Chicago

NAME .....

STREET .....

TOWN ..... STATE .....

BECOME AN EXPERT

ACCOUNTANT

Executive Accountants and C. P. A.'s earn $3,000 to $10,000 a year. Thousands of firms need them. Only 9,000 Certified Public Accountants in the United States. We train you thoroly at home in spare time for C.P.A. examinations or executive accounting positions. Previous experience unnecessary. Training under the personal supervision of William B. Castenholz, A. M., C. P. A., and a large staff of C. P. A.'s, including members of the American Institute of Accountants. Write for free book, "Accountancy, the Profession that Pays."

LaSalle Extension University, Dept. 10464-H, Chicago
The World's Largest Business Training Institution

No Wind Can Blow It Out

SELF STARTING LIGHTER

SOMETHING DIFFERENT
No Flint. No Friction
MAKE UP TO
$40 A DAY
Showing My Mystery Lighter to Men. What Makes It Light? All Guaranteed. No Flint or Friction. New Principle of Ignition. Sample With Sales Plan 25c. Sample Gold or Silver Plated, $1.00. Agents write for proposition.
NEW METHOD MFG. CO.
Desk A.S.-10 New Method Bldg., Bradford, Pa.

BASHFUL?

"Shame on you!" Are you nervous, embarrassed in company of the other sex? Stop being shy of strangers. Conquer the terrible fear of your superiors. Be cheerful and confident of your future! Your faults easily overcome so you can enjoy life to the fullest. Send 25c. for this amazing book.
RICHARD BLACKSTONE
B-4510 Flatiron Bldg. New York

Play the Hawaiian Guitar like the Hawaiians!

Only 4 Motions used in playing this fascinating instrument. Our native Hawaiian instructors teach you to master them quickly. Pictures show how. Everything explained clearly.

Play in Half Hour — After you get the four easy motions you play harmonious chords with very little practice. No previous musical knowledge needed.

Easy Lessons — Even if you don't know one note from another, the 52 printed lessons and clear pictures make it easy to learn quickly. Play as you play.

GIVEN when you enroll —a sweet toned **HAWAIIAN GUITAR**, Carrying Case and Playing Outfit Value $15 to $20
No extras—everything included

WRITE AT ONCE for attractive offer and easy terms. A postcard will do. ACT!

TENOR BANJO and other courses. The same thorough instruction on Tenor Banjo, Violin, Tiple, Tenor Guitar, Ukulele, Banjo Ukulele. Well-known instructors. Write for full information.

FIRST HAWAIIAN CONSERVATORY of MUSIC, Inc.
9th Floor, Woolworth Bldg., Dept. 267, New York, N. Y.
Approved as a Correspondence School Under the Laws of the State of New York—Member National Home Study Council

(This interesting letter from one of our favorite authors is so charged with good humor that it makes an excellent bit of reading. We are especially interested in what you say about Dr. Breuer and his checking the surgical part of the story. We feel under personal obligations to Dr. Breuer for work of this character, which he has done for some of our authors in the past. There has been considerable controversy about the value of human interest or the injection of material containing emotional value in scientifiction. We would like to have more comments regarding this from our readers.—EDITOR.)

REPRINTS WHICH WERE ENJOYED—THE STORIES OF JOHN W. CAMPBELL, JR.

Editor, AMAZING STORIES:

I have just received my copy of the August number of AMAZING STORIES, and, as usual, turned to the "Discussions" column at once.

I have been an interested reader, off and on, of AMAZING STORIES Magazine ever since it first came on the stands in 1926, and regret nothing more than the few copies I've been so unfortunate as to miss occasionally, here and there. Once in a while I don't like one of its stories, and feel an impulse to write in about it, but then I say to myself, "What's the use of being a knocker; if you can't say something constructive, best not say anything at all," and let it go at that. It takes a little of everything to make up a "good whole," and one cannot always find everything to one's liking. I have no real criticism whatever to make of it, and I consider it fills a very real place indeed in the needs of the general public.

I have also been a reader of "Argosy" for the past twelve years, ever since I was in "knee breeches"; I have read the originals of practically all the stories you have reprinted therefrom, and I can tell you I was glad to see them once more. Such tales as "The Moon Pool," and "The Conquest of the Moon Pool," by A. Merritt, and "The Girl in the Golden Atom," by Ray Cummings, will live long in the mind of the true scientifiction lover. They have the appearance of old friends resurrected anew, all agog to greet one again from the pages of one's favorite magazine, by a cosy fireside on some rainy evening.

I have long wished to enter the "Discussions" column of AMAZING STORIES, but decided I had best hold off my first attempt until something of importance gave me cause to write. Gabriel Kirschner's letter, condemning the author of "Piracy Preferred" along with A. Hyatt Verrill, proved to be the needed stimulus. I have watched the "Discussions" column attentively ever since AMAZING STORIES first commenced publishing stories by John W. Campbell, Jr., and Mr. Kirschner's letter is the first real note of disapproval I have observed.

I have known John W. Campbell since last summer, when we were classmates together at the Summer Session of the Massachusetts Institute of Technology here in Cambridge, and I count him one of my best friends, so it is not unnatural for me to rise in his defense.

Mr. Kirschner held that he was too much given to explanations, and made the sweeping statement that this "ruined the whole man and his works." I wonder if my esteemed co-correspondent has paused to realize that the story is based upon the development of a number of scientific theories, and that, while they are of course purely fictional, in order to have a scientific appearance they must be treated in a scientific manner. Any scientist will demand proofs before he will accept a theory as fact, proofs call for explanations, and John W. Campbell is a scientist *par excellence* (on this point I think even Mr. Kirschner will agree with me). At every point where one of his characters develops something new, Campbell has the character explain the hitherto unknown principles of his discovery to his co-workers. I believe this to be perfectly in keeping with the scientific background of such a magazine as AMAZING STORIES and would advise Mr. Kirschner, if he finds it too boring or wearisome for his active mentality to follow these explanations, to seek his entertainment on other pages.

John Campbell and I had rooms together in the same apartment in Cambridge last summer, and I have seen him off and on all through the winter, so I believe I can lay claim to knowing the man fairly well. We used to congregate sometimes in the evenings, down in the little old kitchen at Bigelow Street, Campbell, his roommate, occasionally some of his classmates, and myself, put our feet up on the battered white table, get the old briars a-smoking (this last excepting Campbell, who doesn't use the "weed"), and hot and heavy would be the arguments over some of the theories expressed in one of his latest "yarns." It was here that I read the manuscripts of "When the Atoms Failed," "The Metal Horde," "Piracy Preferred," and "The Voice of the Void," (which last I note with pleasure appears in the Summer Edition of the Quarterly), before they were sent to the publisher of this magazine. I consider his stories exceedingly good, particularly in view of the fact that he is not as yet overburdened with years, and I look forward to many more of the same among the pages of AMAZING STORIES as the years roll on. More power to him!

Richard Rush Murray,
10 Sacramento Street,
Cambridge, Mass.

(Judging from the number of letters of praise that come in for Campbell's stories, as against letters of adverse criticism, we don't think he needs as good a champion as you seem to be. We are glad, however, to print your letter, and thus give Campbell's growing circle of followers the pleasure of this little personal touch—particularly in the picture you draw wherein is shown much haggling over new theories expounded by our new author. Perhaps even Mr. Kirchner will judge differently of the next of Campbell's stories which we plan to publish soon.—EDITOR.)

A LETTER FROM THE INNERMOST HEART OF THE WRITER

Editor, AMAZING STORIES:

I doubt very much whether you like to read letters such as this, but believe me, it comes from the bottom of my heart and I mean every word I say. I have read AMAZING STORIES since its very first issue and I have read its sister magazine, SCIENCE AND INVENTION, since the days of the Electrical Experimenter. And because of my familiarity with your publications, I consider myself fit to judge the finest of them all, AMAZING STORIES.

Science is the core of my soul and scientifiction is the meat around it. I live only for science, it is my god, and all I hope is that I am fit in every way to take over the rôle of a research chemist when I leave college.

Now for the criticism for which this letter was intended. Your magazine is deteriorating. Do you honestly think that the last four issues, from April to July, have lived up to the wonderful standard set during the past five years? All during the past year, I have noticed a decline in the quality of the stories. This, of course, is not your fault, but is the direct result of the rival publications. You have got to beat them. If I may have the presumption to say so, I'll warrant that you do not have anywhere near the amount of copies sold each month that you had two years ago. If I am wrong, throw this letter into the waste basket. But whether I am right or wrong, your magazine is no longer as good as it used to be.

There is only one way to beat the others and make your magazine finer and better in every way. And that is to print reprints. There are hundreds of good, old stories that you might print, any one of which is fifty times as good as the junk you now publish. Why don't you try printing two or three of the old stories each month? I cannot understand why you do not do this for the profits that would result would surely make up for the extra cost, if any. My advice is that you let the readers vote whether they want reprints or not. I am certain, and so are you, that the majority would want some of the good, old scientifiction gems. Why not let them vote for it?

Now that I have gotten this weight off my chest, and not a bit of it is mere blow either, I would like to tell you that I am writing a story for your magazine. This may sound strange from a reader who wants you to return to the reprints as much as I do, but if, in your opinion, it does not live up to the quality of fiction that you printed two years ago, please send it back without a second's consideration and I will send it elsewhere. It is my third attempt at writing scientifiction and is, of course, an interplanetary story as are almost all the stories by new authors.

This story has to do with a member of our solar system never before visited by authors of scientifiction (and it is not the new planet). I have put as much science in it as possible so that it almost resembles "Around the Universe." I have been working on it for the past six months and it is only fifty typewritten pages long. I expect to send it in to you within two or three weeks, unless I get a job, and then it will be longer.

But I couldn't help writing in and begging you to give us poor readers something good for a change—a reprint.

Dan Taylor,
3079 Broadway,
San Diego, Calif.

(The heading we have given this letter indicates our feeling that it is thoroughly sincere even if it also is a little hard on our efforts. We certainly are doing our best to make the magazine acceptable to you, since it is your magazine, and we are thankful for your criticisms. We will certainly give this matter of reprints our careful consideration, although the number of reprints asked for—in the correspondence which comes to our office—is negligible compared to the number who want new stories. It is interesting to note how loyalty crops up even in your scolding letter. It is that that encourages us to carry on. We will be very glad to see your story and give it our careful consideration.—EDITOR.)

A CLASSIFICATION OF AUTHORS. "AMAZING STORIES" AS A BI-MONTHLY. THE ROCKET IN A VACUUM

Editor, AMAZING STORIES:

"The Message from Space," by David M. Speaker, in the July issue really is a most wonderful story. I think so far it ranks highly in being the best story that I have read; it has a real kick all the way through. "The Driving Power," by Miles J. Breuer, M.D., was also a very good story. "The Explorers of Callisto," and the sequel to it, "Callisto at War," by Harl Vincent in the February issue, was an extremely interesting scientifiction story.

I have listed below, some authors which class, at least in my opinion, as your best. They write almost all, if not all interplanetary stories, every one of which is very interesting.

Edmond Hamilton and A. Hyatt Verrill almost tie for first place, but I believe Hamilton really wins the loving cup. David M. Speaker; Miles J. Breuer, M.D.; and Harl Vincent tie for second.

I am wondering if it would be possible for you to publish two magazines a month instead of one? I am sure, if it were possible for you to do this that you would be benefited, as much as the readers of your scientifiction. One reason why I like your magazine, and why so many other scientifiction lovers like it, is because the authors use mostly interplanetary stories.

Your magazine is by far the best magazine of its kind on the market. I am, for a fourteen-year-old boy, very busy, but never yet has it occurred, since I first saw AMAZING STORIES on a newsstand, that I have not had time to read your most wonderful AMAZING STORIES.

I hope in the far future (or maybe not so far at that), to fly by means of a rocket beyond the earth's atmosphere, or into interstellar space, for I presume that within 15 or 20 years rockets will take the place of Airplanes! And according to the rate at which we are now progressing, I believe that we will also have control over them.

Please answer this question:

Would a rocket fly better in the air (or atmosphere), than in a vacuum (or space)? I believe that a rocket would fly better in a vacuum, but have no actual proof.

This is a rather long letter, and crudely worded, but I wanted to have my say.

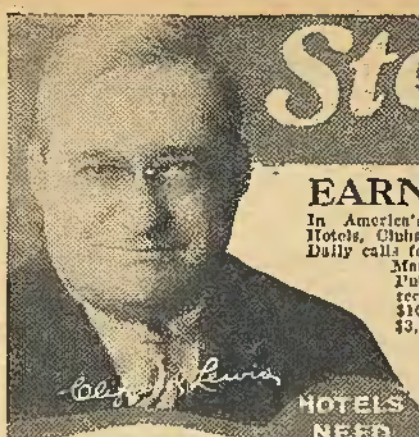
Thomas Jared Morrisey,
3420 East 5th Street,
Los Angeles, Calif.

(You have certainly selected stories by excellent authors, in expressing your approval of them in the first paragraph of your letter. The drift into interplanetary stories which you indicate, we sometimes feel has become too pronounced. It is our desire to have AMAZING STORIES cover the entire field of natural science and we should personally be glad to find a larger proportion of stories relating to things on the surface or in the depths of Mother Earth. But an Editor must not be affected by personal considerations, he must think of his readers and please them. The idea of publishing two magazines a month has been talked over and discussed here for many months. There is no telling what may be done in the future as far as the publication of our magazine is concerned. You speak of the possibility of flying outside the earth's atmosphere. A rocket will fly much better in a complete vacuum than in the air; air operates to retard its flight and does not help its propulsion in any way.—EDITOR.)

Step INTO A BIG PAY HOTEL JOB

EARN $2,500 TO $10,000 A YEAR

In America's 3rd Largest Industry comprised of Hotels, Apartment Hotels, Clubs, Restaurants, Institutions, Schools, Colleges, Hospitals, etc. Daily calls for Lewis-Trained Men. Over 70,000 high-class positions as Manager, Assistant Manager, Steward, Engineer, Room Clerk, Publicity Director, Purchasing Agent, Bookkeeper, Sports Director, and scores of other executive positions paying $2,500 to $10,000 a year open annually in hotels alone. Salaries up to $3,500 to start.



HOTELS NEED TRAINED MEN

We Put You in Touch with Positions

Without cost let us show you how big pay, fascinating work, quick advancement can be yours in the great hotel industry. Age is no obstacle—young and old alike can win success. A good grade-school education is all you need with the amazing Lewis System of Spare-time Training in Hotel Operation.

SEND FOR FREE BOOK

Previous Experience Unnecessary

Hundreds of Lewis Students are winning success. Totally unacquainted with hotel work before taking the Lewis Course, N. Frank Hillis is now Assistant Manager of a $250,000 Apartment House. Leo A. Haas, an insurance salesman before taking the Lewis Course, is now Assistant Manager of a beautiful hotel. YOU can do as well. Low cost—easy terms—money back agreement. National Employment Bureau FREE of extra charge. Write today for Free Book, "Your Big Opportunity" and complete details mailed without obligation.

LEWIS HOTEL TRAINING SCHOOLS
Room CS-7639 Washington, D. C.
The Original and Only School of Its Kind in the World

These Lewis Students "Made Good"

O. F. Stuart: "I accepted the position of Manager. I know my course is going to bring me through with colors flying."

C. A. Jones: "I was chosen Manager of this Hotel. My success is due to the Lewis Schools."

R. J. Grout: "I have been appointed Assistant Manager of this 400-room Apartment Hotel. I can never thank the Lewis Schools enough for their assistance."

Henry R. Thompson: "I will have charge of the Auditing Department in this new Hotel at 100% increase"

OPPORTUNITY COUPON

Lewis Hotel Training Schools
Room CS-7639, Washington, D. C.

Send me the Free Book, "Your Big Opportunity" without obligation.

Name .....

Address .....

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

Easy to Earn $12 a Day

Showing Taylor Hats

If you are looking for an easy way to earn big money, be my partner. Show my Wool Felt and Belgian Fur Felt Hats to friends and take their orders. Six latest colors. Smartest styles. You save them $2 to $5.00 and can make $12.00 daily for yourself.

Wear Sample Hat

A new startling plan for men with or without experience. I supply everything and give you special sample hat offer. Rush your name and address for complete outfit. Send no money. It's FREE! I'll also send new line Rain-Proof, Made-to-Measure Caps in latest styles. J. W. Taylor, Pres.

TAYLOR HAT & CAP MFRS., Desk C-365, CINCINNATI, OHIO

BE A PHOTOGRAPHER

Many Earn $2,000 to $12,000 a Year!

Tremendous demand for trained Photographers. Fascinating, easy work—BIG PAY! Our Simplified Plan trains you for a well-paid position or to open a studio of your own. FREE booklet gives complete details — tells how you can quickly qualify as

☐ Motion Picture Cameraman or ☐ Projectionist
☐ "Still" Photographer or ☐ Photo-Finisher

Send for it *Today*—NOW!

New York Institute of Photography
Dept. S-933, 10 W. 33rd St., New York City

HELP!! HELP!!
WHO CAN GET ME OUT?
I'll Pay $8000.00 Cash

Come to my rescue—QUICK! I'm **hopelessly lost** in these treacherous, trackless catacombes. I've tried for hours to find the right path to freedom but here I am right back in the middle again.

Can YOU Find the Right Path?

Will you try? A Thousand Thanks!—I know you would. But first, let me warn you that *there is only one path* to freedom and it's—Oh! so hard to find. It starts in the middle where I am and, **without crossing any of the walls,** it ends somewhere, on the outside of these terrible catacombes. I hope you can find **the right path** to get me out. If you do, mark it plainly with pen or pencil and send it to me quick. *If Correct*, I'll see that you are qualified at once for an opportunity to win as much as $2320.00 cash out of $8,000.00 *in rewards* that I'm going to give away.

$1000.00 CASH Just for BEING QUICK!

Yes; I'll positively pay ONE THOUSAND DOLLARS cash to someone, just for being prompt and duplicate prizes in case of ties. IT'S ALL FREE! Anyone may try for nothing, so send YOUR answer today. Rush it!

L. SHULMAN, 37 W. Van Buren Street, Dept. 203, CHICAGO, ILLINOIS

Know the Facts About Your Own Body!

ARE there certain questions about your anatomy which you would like to ask your doctor? Is your love-life unhappy because you do not clearly understand basic facts about male or female organisms? Have you symptoms of any form of affliction you do not understand? If you would like the mysteries of male or female anatomy lucidly explained and illustrated, mail the coupon below today!

TABLE OF PLATES

1 Male Body
2 Female Body
3 Blood Circulatory System
4 Muscular System (Posterior)
5 Muscular System (Anterior)
6 Nervous System
7 Skeleton System
8 Respiratory System
9 Digestive System
10 Male Organs in Detail
11 Female Organs in Detail
12 Cross-Section of Pregnant Female Body with Child

The Veiled Truth Brought Into the Light

Physical prowess, beauty of form, grace of body, the relation of the sexes . . . these, often veiled, constitute the theme for a thousand poems and novels. But the dignified study of the body's organs in detail is seldom available to the average individual, excepting in special college medical courses.

Now, because they believe it is your birthright to know and understand the truth—because ignorance is inexcusable and often disastrous—our medical staff experts place such vital fundamental facts of life within easy reach of everyone in the unique new manual—

ANATOMICAL MANIKINS

MALE AND FEMALE

By Dr. David H. Keller]

This new book shows the human body with each aspect of its structure in separate section, the exact position of all the organs, of every vein, artery, nerve, muscle, bone, etc.

The book is 14 inches high and 6 inches wide. It contains twelve full-page color plates and twelve text pages illustrated with fifty photographs and drawings.

The color plates have been made from actual photographs and show all organs and parts of the human body—male and female—in great detail in their natural colors.

12 Plates in Actual Natural Colors

Opposite each plate, an explanatory text is provided, written by Dr. Keller, and illustrated with photographs and drawings to explain the functions and other features of different organs of the human body.

Anatomical Manikins is especially recommended for the use of medical students, nurses, art students, to lawyers for use in litigations, lecturers, physical culturists, hospitals, sanitariums, schools, colleges, gymnasiums, life insurance companies, employee's health departments, etc.

But every man and woman should own a copy of Anatomical Manikins, for effective knowledge of his or her own physical self!

All married persons should own a copy so that they may have an exact knowledge and proper understanding of the opposite sex and thus be better equipped to make their mutual love-life happy.

It is of inestimable value to the prospective mother, because of the information it provides on the essential anatomical facts of pregnancy, etc.

Usual Cost $25 Now Only $1 the Copy

The publishers have made it possible for everyone to own a copy of this valuable book. Books of this kind, when bought through the regular medical supply establishments, cost anywhere from $15.00 to $25.00 a copy. Our book, equally valuable, with twelve large plates of the human body—all in full color, each with an accompanying page of text profusely illustrated—can be bought for the low price of—

Only $1 per Copy—Money Back If Not Satisfied

Don't let "false modesty" rob you of your birthright! Don't live in ignorance and risk wrecking your own happiness. Understand the greatest forces of life. Know the human body—male and female—as heretofore only privileged medical students have been able to know it!

If you would like to examine this book, just mail the coupon and copy will be expressed to you immediately. Under our guarantee you risk not one penny. So send for your copy now!

Mail Coupon Today

Experimenter Publications, Inc.
Dept. 2110 L, 381 4th Ave.
New York, N. Y.

$25.00 Value for **$1**

Gentlemen:—Enclosed find $1.00 plus expressage (10 cents in U. S., 20 cents in foreign countries) in full payment for a copy of ANATOMICAL MANIKINS. (Money will be promptly refunded if you are not satisfied.)

Name .....

Address .....

City and State .....

A LETTER FROM A READER IN THE ANTIPODES

Editor, AMAZING STORIES:

I casually picked up your magazine at a local bookseller's, and since then have been hunting the town for back numbers. It is out of pure gratitude that I communicate with you. You see, here in New Zealand we are very badly off for anything anywhere near so enthrallingly interesting as your publication, and very few of the chaps seem to know that there is such a magazine in existence.

I note your encouragement of criticism, destructive or otherwise, and will take full advantage of it. Let's start the wrong way round, commence with the bitter part of the pill, and finish up with the sugar coating.

That story, "The Universe Wreckers," seemed to me to be constructed in a hurry and with practically no attention to scientific data. Surely Mr. Hamilton must realize that were two bodies traveling at the terrific speeds of the "space-flier" and the meteorite to collide, even if only a glancing blow, there would never be any question of ripping fabrics. The immense heat generated by such an impact would immediately cause those surfaces, if not to vaporize, at least to become incandescent. As for merely ripping up an outer shell covering, well——

Another thing. I suppose the force-ray which is causing the sun's accelerated rotation must by reaction be throwing Neptune out of its orbit with a force equal to that which it is exerting upon the sun. And if the force is situated, (as it must be—I haven't found that part out yet) at one of Neptune's poles, surely the gyroscopic action of even Neptune could not equably stand the thrust of such a mighty ray—one which was accelerating the enormous bulk of the sun to such an extent that daily its period of rotation decreased by four hours. Still, I suppose it's rather rotten to criticize on such scant scientific knowledge as mine. I only wish I could write half as well myself. It's very plausible, if you don't go into it too deeply.

That story, "Synthetic" by Mr. Cloukey, most enjoyable, and really entertaining. The poem, "Vis Scientiae," by Dr. Miles J. Breuer, is fine.

"The Madness of the Dust." Well, I'm not particularly keen. Still, one man's meat is another's poison.

"Through the Veil." Didn't greatly enjoy it, partly, I think, because Conan Doyle was dragged into it. Out here, that man is as popular as a pork chop at a Synagogue. His own fault, we think. Tell you on the Q. T.

"The Ivy War," convincing and most plausible. A most entertaining story.

"A Circe of Science," too vague—not definite enough as to the actual treatment used. When we are told that the habits of living creatures are by some method made diametrically opposite to their former ones, it naturally follows that chaos would reign. That could be touched upon. A good opportunity was missed in that story. It was the sketchy treatment of the actual methods used in the mutation of the species. Readable though.

"The Noise Killer." Good. Thoroughly enjoyable. A bit weak in the fade-out. Not quite convincing at the finish. Still, it was a difficult position for the author and quite a neat, if commonplace solution.

But I think that one of the greatest stories I have ever read was "The Gimlet." I don't think I ever enjoyed anything so much in my life before. I have read it and re-read it, and each time have enjoyed it more. Stick to that new author, Mr. Editor, he certainly is what you call "the goods." He has the same neat touch of humanity that characterizes H. G. Wells at his best. His science is irreproachable. A magnificent yarn, that holds one absolutely enthralled.

That is all, sir. Thank you for the time spared me, but this letter I really enjoyed writing—even if it should bring a storm of abuse on my probably deserving head. Good luck to your magazine; it deserves it.

John Bright,
P. O. Box 95,
Gisborne, N. Z.

(Perhaps by this time, you will have found the reaction of the force-ray very well taken care of in Mr. Hamilton's story. "The Gimlet" was quite an ingenious piece of fiction; it has actually been proposed to sink a great well far down into the earth in order to determine, as well as it may be, what the condition of things is miles below the surface of the earth. We are glad you enjoyed writing your letter; we enjoyed reading it.—EDITOR.)

NO MORE BIG TIRE BILLS!

GOOD YEAR · FISK · Firestone · U.S. AND OTHER TIRES

At ¼ Regular Prices

Tires You Know and Prefer AT NEW LOW PRICES!

You can rely upon Chicago's oldest and most reliable rubber company to deliver tire mileage at lowest cost. Actual tests on the worst roads in the country prove that our standard brand, reconstructed tires deliver 50 to 00 per cent more service. A trial order will convince you.

BUY NOW 12 MONTHS SERVICE GUARANTEED SAVE MONEY

BALLOON Tires			Reg. CORD Tires		
Size Rim	Tires	Tubes	Size	Tires	Tubes
29x4.40-21"	$2.30	$1.10	30x3	$2.20	$1.00
29x4.50-20"	2.40	1.15	30x3½	2.25	1.00
30x4.50-21"	2.45	1.20	32x3½	2.70	1.15
28x4.75-19"	2.45	1.20	31x4	2.95	1.15
30x4.95-21"	2.90	1.35	32x4	2.95	1.15
30x5.00-20"	2.95	1.35	33x4	2.95	1.15
28x5.25-18"	2.95	1.35	34x4	3.00	1.15
30x5.25-20"	2.95	1.35	32x4½	3.20	1.45
31x5.25-21"	3.20	1.35	33x4½	3.20	1.45
32x5.77-20"	3.20	1.40	34x4½	3.45	1.45
31x6.00-19"	3.20	1.40	30x5	3.60	1.75
32x6.00-20"	3.20	1.40	33x5	3.60	1.75
33x6.00-21"	3.20	1.45	35x5	4.45	1.75
32x6.20-20"	3.65	1.75	All Other Sizes		

DEALERS WANTED

All Tubes New—Guaranteed First Quality

Send only $1.00 deposit with each tire ordered, balance C. O. D. If you send cash in full deduct 5 per cent. You are guaranteed a year's service or replacement at half price.

MIDLAND TIRE & RUBBER COMPANY

Dept. 214 1000-10 W. Sixty-Third Street Chicago

See the Craters in the MOON!

Astronomical and Terrestrial TELESCOPE Magnifies 30 Times

Own a genuine Astronomer's Telescope. See thousands of miles away. Make Sun, Moon Planets, Stars your next door neighbors. Moon Craters, Sun Spots, Eclipses, Comets enlarged 30 times. Strange thrills! Price Only $3.95

Hours of fun looking at scenery, games, bathing beauties. Great for trips and voyages. Made like telescopes used in observatories. Carding wrote, "Moon seemed 10 yards away."

See Landscapes, Games, Ocean Scenes, Enlarged 30 Times!

Diameter 2 inches. Special friction adjustment for focusing. Adjustable bracket and clamp can be fastened to chair, fence, branch, etc. Finest materials. Will last a lifetime.

Five Days' Free Trial

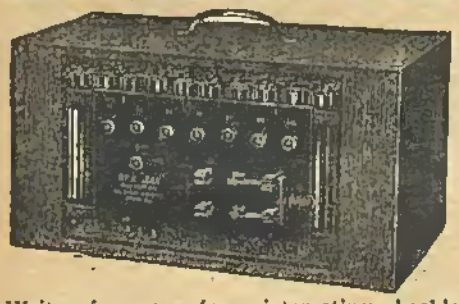
Rush only $1.00 now. Pay balance $2.95 plus postage, when postman delivers. Keep 5 days. If not delighted, return telescope and money will be refunded.

EARN $10 A DAY Charge 25c to look at the moon

ROLL-O SPECIALTY CO., Dept. L-335 220 E. 3rd St., Cincinnati, O.

"Dependable 'B' Battery Power"

For long and short wave receivers. Prices reasonable. Also "B" batteries operating from 32 to 110 volt D. C. farm lighting systems.



Write for our free interesting booklet. See Jay Battery Co., 911 Brook Ave., N. Y. C.

Learn Photography at HOME

Make money taking pictures. Prepare quickly during spare time. Also earn while you learn. No experience necessary. New easy method. Nothing else like it. Send at once for free book, *Opportunities in Modern Photography*, and full particulars.

AMERICAN SCHOOL OF PHOTOGRAPHY

Dept. 1427 3601 Michigan Ave. Chicago, U. S. A.

MONEY MAKE BIG MONEY MONEY

Just out. Lights gas instantly without sparks or flame. Sells like wildfire wherever gas is used. Retails for 25c.

MYSTERY GAS LIGHTER

Packed on individual cards with instructions. Sample 10c or rush $9.00 per Gross or $1 per Dozen. New Method Mfg. Co., Desk AS-10, New Method Bldg., Bradford, Pa.

COMMUNICATION THROUGH THE HEAVYSIDE LAYER, THE INTELLIGENCE OF ANTS

Editor, AMAZING STORIES:

The stories are very good, although some are much better than others. However, I have noticed that some of your authors are better writers than scientists. Nearly every magazine contains one or more stories in which the author makes use of his vivid imagination to supply the "science" that should be in every true scientifiction story. Here are a few errors I found in the May issue:

1. In "The Universe Wreckers," a very interesting story by the way, the author states that communication could not be established between the space-ship and the earth because of the well-known "Heavyside Layer" surrounding the earth, which prevented any communication vibrations from penetrating to the earth. However, the great force-ray which supplied the motive power for their ship *did* penetrate this layer. Dr. Whitely had perfected an instrument that could detect this ray and even determine the direction from which it came. Could not this ray have been used in communicating with earth, by using the Morse or other telegraph code?

2. Another error in the same story—The space-ship was traveling at a speed of about five million miles per hour when it was struck by one of the meteors near Saturn, which stopped the generator and cut off their power, allowing the ship to fall toward the planet. Their speed would not increase because there is no friction in space; in fact the planet would increase their speed, at the same time changing their course. Yet, when the connections were completed and the generators able to supply the power for the force-ray again, the ship, which was hurtling straight at the rings of Saturn at nearly one-tenth the speed of light, instantly reversed its direction with no lasting ill effects to the travelers, two of whom were clinging to the outside! Then, in "one moment" Randall had halted the ship at a "great distance" from the rings that had been so close "one moment" before! *Super-men and super-machine!*

3. Again in the same story—Saturn appeared to be a yellow glowing disk when they were approaching at five million miles per minute. When going away from the planet at the same speed, she still appeared yellow. I would think that a difference of ten million miles per hour would make some difference in the apparent color. Verdad?

4. Is Mr. A. M. McNeill an aviator? I have never heard of a pilot who would deliberately put his ship in a tail spin when his motor went dead.

In spite of the occasional errors, I enjoyed "The Universe Wreckers" very much. I am eagerly awaiting the next instalment.

Here in the tropical jungles of Panama I have seen so many strange things that I will never say that a thing is impossible, unless it is absolutely proven to contradict all known laws of science. The other day I spent some hours watching a colony of leaf-cutting ants at work. (Incidentally I missed my dinner to do this.) The intelligence displayed by these ants is marvelous. One group of ants stayed in the tree all the time, cutting the leaves into small irregular pieces about three-quarters of an inch across, letting them fall to the ground. On the ground another group waited to carry these pieces away. They carried them about a hundred yards through the jungle to where a road had been cut through by the army of the government for military purposes. Here the leaf fragments were dropped and the tireless workers returned to the tree for more. Another group picked them up and carried them across the road and dropped them. Apparently the hot sun was as distasteful to them as it is to a man. After each short trip across the unsheltered road, they stopped to rest a while in the shade. A fourth group of ants carried the leaves the rest of the way to their "home." These leaves are used to line the chambers and passageways. A kind of fungus grows in the decomposing leaves, which the ants use for food. Intelligent? Yes! I believe they have more intelligence than is oftentimes displayed by the self-styled "superior" *genus homo*.

I am always interested in stories in which the insects are pictured as possessing great size or superior intelligence or both. Giant ants? Yes, we have them down here. And how! Last year a party from our company was out in the jungles on a surveying detail. One morning one of the men could find nothing but the buttons of his trousers. The ants had entered the tent during the night and had eaten the cloth, leaving only the buttons. It's a wonder to me that they didn't take the buttons with them as souvenirs. We

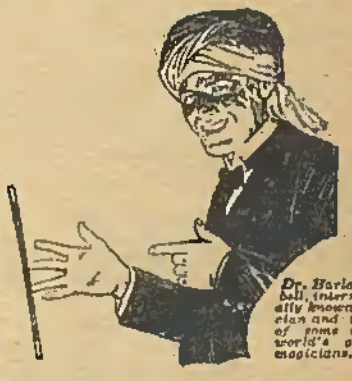
if-

you pledge

yourself to secrecy we will teach you the secrets of

Real Professional

Magic



Dr. Harlan Tarbell, internationally known magician and teacher of some of the world's greatest magicians.

Learn to be a Magician

For the first time in the history of Magic the age-old, sacredly guarded secrets of the Mystic Art are being revealed. Now at last you can learn to be a Real Professional Magician. Yes, and you can learn this wonderful art *easily and quickly* AT HOME. You are taught the mysterious *Principles* by which the Professional Magician works. You are taught everything from wonderful impromptu effects to massive stage illusions. But before you can study, you must sign the Magician's Solemn Pledge of Secrecy. This means that you are getting the *guarded secrets* of the Magic Profession. Think of that!

Earn Big Money

There's a big demand for Magic entertainment. Magicians get big money. Dr. Tarbell gets as high as $250 for a half hour's work. Unlimited opportunities for you!

Write for Details!

No Salesman Will Bother You!

Mail coupon now for the free Magic literature telling all about the great Tarbell Course in Magic. Get our Low Prices and Easy Payment Plan. No salesman will ever call, bother or annoy you.

Tarbell System, Inc., Studio 11-97
1926 Sunnyside Ave., Chicago, Ill.

Tarbell System, Inc., Studio 11-97
1926 Sunnyside Avenue, Chicago, Ill.

Gentlemen: Without any obligation send me your free literature and information all about your wonderful "Tarbell Course in Magic." Also tell me about your Low Prices and Easy Payment Plan.

Name.....

Address.....

.....Age.....

OPPORTUNITY AD-LETS

Rate—Eight cents a word. Cash should accompany all advertisements unless placed by an accredited advertising agency. Advertisements for less than 10 words not accepted.
EXPERIMENTER PUBLICATIONS, Inc., 381 Fourth Ave., New York City

AGENTS WANTED

Agents—No Hard Times. Earn up to $12 daily wearing fine Felt Hats and showing friends. Smartest styles. Latest shades. $2 to $5 saving. Samples free. Taylor Hat & Cap Mfrs., Dept. GC-385, Cincinnati, Ohio.

Agents everywhere making money with our line of kitchen specialties, demanded in all homes. Big earnings possible. Write today for details. A. Seed Filter Co., 353 Broadway, New York.

Our LUMINOUS CRUCIFIX and new LUMINOUS ST. THERESE STATUE shine brilliantly in the dark. Sell on first demonstration. Write today for prices. W. G. Hannan Co., 2547 South State St., Chicago.

YOU ARE WANTED TO RESILVER MIRRORS AT HOME. Profitable business plating autoparts, tableware, etc. Write for information. SPRINKLE, Plater, 815 Marion, Indiana.

CORRESPONDENCE COURSES

Used Correspondence School courses sold on repurchase basis. Also rented and exchanged. Money back guarantee. Catalog free. (Courses bought.) Lee Mountain, Pisgah, Alabama.

HELP WANTED MALE—INSTRUCTION

DETECTIVES Earn Big Money. Experience unnecessary. Write, American Detective System, 2190K Broadway, N. Y.

MAGIC

Astounding Magic. Take card, change to box of matches and change box to card—15c. Oriental Novelty Co., 449 Ridge Road, Lyndhurst, N. J.

MALE HELP WANTED

GET outdoor government jobs; $135-$200 month; vacation. Patrol forests and parks; protect game. Details free. Write—DELMAR INSTITUTE, B. 36 Denver, Colorado.

PERSONAL

Now, a completely illustrated course on strength building, with instructions on making your own apparatus. Build your strength as I did, in a gym of your own. Will show you how to build a rowing machine and wall exerciser combined, bar bells, etc. Simply pin a two dollar bill to sheet containing measurements and mail to L. J. Keith, 4512 Pimlico Rd., Balto, Md.

TALKIE AND MOVIE PRODUCERS are clamoring for new short story ideas, plots, etc. Perhaps you can write one that we can shape and sell for you. One writer (V. M.) received $3,000. New York best market. Write for full particulars. Daniel O'Malley Company, Suite B, 1776 Broadway, New York.

PRINTING

100 Business Cards 75c; 1000, $2.95, printed. Greene Printing Co., 215 Davis Ave., Dayton, Ohio.

PRINTING OUTFITS & SUPPLIES

Print your own cards, stationery, circulars, advertising, etc. Junior Press $5.90, Job Presses $11 up, Power $149. Print for others, big profit. Easy rules furnished. Write for free catalog and full information. Kelsey Co., R-67, Meriden, Conn.

SONG POEM WRITERS

COMPOSERS—VERSE OR MUSIC. Brilliant opportunity. Write at once. Van Buren, 2110 McClurg Bldg., Chicago.

Writers—Poems, Melodies—opportunity. Tommie Malle, EXG4215 North Ave., Chicago.

SONG POEM WRITERS—"Real" proposition. Hibbeler, D-191, 2104 Keystone, Chicago.

RUPTURE IS NOT A TEAR

NO BREAK TO HEAL

Rupture is not a tear, but is due to a muscular weakness in the abdominal wall. Trusses merely brace these muscles but do not strengthen them—on the contrary, the gouging of the ordinary truss pad often increases this weakness as it tends to shut off circulation of the blood.

STUART'S ADHESIF PLAPAO-PADS are **patentably different**—being mechanico-chemico applicators—made self-adhesive purposely to keep the muscle-tonic called "Plapao" continuously applied to the affected parts, and to minimize danger of slipping and painful friction. The adhesive fabric is **soft as velvet** and clings to the body **without straps, buckles or springs. Easy to apply—comfortable—inexpensive.** Awarded Gold Medal, Rome, Grand Prix, Paris, Honorable Mention, Panama Pacific Exposition, San Francisco, etc. For almost a quarter century stacks of **sworn testimonials from many different countries report success—without delay from work.** The epidermatic absorption of Plapao utilizing "mechanico-chemico therapy" tends toward a natural process of recovery, **after which no further use for a truss.**

Stop wasting your time and money on old-fashioned devices. Learn how to close the hernial opening as nature intended, **so the rupture can't come down.** Send no money; just mail the Free Test coupon below. For your own good—write today—tomorrow may be too late.

FREE TEST COUPON
Plapao Laboratories, Inc.
686 Stuart Bldg., St. Louis, Mo.

Send me a Free 10 day test supply of the remedial factor Plapao and 48-page illustrated book on Rupture; no charge for this now or later.

Name.....

Address

RADIO BARGAINS

Low Power Transmitter adaptable for phone or code. With plug-in coils $14.75
Auto Radio—Uses 3—224 and 3—227 tubes, single dial, tremendous volume. Compact. Fits any car 20.00
B Eliminator. Bone Dry with 280 tube, 180 volts, will operate up to ten tube set, fully guaranteed. 6.75
AC—A B C power packs 9.75
Power and Filament Transformers for 220, 227 and 171 tubes, with double choke 4.00
Tubes: UX type, 30-day replacement guarantee. No. 210, $2.25; No. 250, $2.35; No. 281, $1.85; No. 245, $1.25; No. 224, $1.25; No. 227, 75c; No. 226, 65c; No. 171, 75c.
CHAS. HOODWIN CO. 4240 Lincoln Ave. Dept. K-J. Chicago

MONEY FOR YOU AT HOME

YOU can earn good money in spare time at home making display cards. No selling or canvassing. We instruct you; furnish complete outfit and supply you with work. Write to-day for free booklet.
The MENHENITT COMPANY Limited
248 Dominion Bldg., Toronto, Ont.

QUIT TOBACCO

Don't try to banish unaided the hold tobacco has upon you. Thousands of investigate tobacco users have, with the aid of the Keeley Treatment, found it easy to quit.

KEELEY TREATMENT FOR TOBACCO HABIT Quickly banishes craving for tobacco. Successful for over 50 years. Write today for FREE BOOK and particulars of our MONEY-BACK GUARANTEE.

THE KEELEY INSTITUTE, Dept. L-608 Dwight, Ill.
Home of the famous Keeley Treatment for Liquor and Drugs. Booklet Sent on Request. Correspondence Strictly Confidential.

AVIATION Information FREE

Send us your name and address for full information regarding the Aviation and Airplane business. Find out about the many great opportunities now open and how we prepare you at home, during spare time, to qualify. Our new book "Opportunities in the Airplane Industry" also sent free if you answer at once.

AMERICAN SCHOOL OF AVIATION
Dept. 1427 3501 Michigan Ave. CHICAGO

missed a transit instrument the same day; perhaps that is where it went.

Edward I. Huscher,
Headquarters and Service Co.,
Eleventh Engineers,
Corozal, Canal Zone.

(We certainly cannot answer for what can be done in the way of utilizing the force-ray. If our readers want interplanetary stories, as they certainly do, we must allow a good deal of latitude, such as Mr. Hamilton, who is greatly admired by our readers, employs. We are glad to hear you say that the result of your experience in the tropics has been to make you disinclined to believe in the impossible. Your idea of the ants taking the buttons as souvenirs is certainly original, to say the least. We understand from your second clause that you would attribute a sort of Doppler effect as to the light given by Saturn in the story. But this effect would bring Infra-red rays into the field so that the yellow may very well be preserved—EDITOR.)

A TRIBUTE TO AND CRITICISM OF A. HYATT VERRILL

Editor, AMAZING STORIES:

I am not a regular reader of your magazine, but shall always buy a copy if the index includes A. Hyatt Verrill's name. It was my misfortune to miss his first story of "The Green Prism," but the second two-part novel was read with sincere interest. However, here are some comments.

Mr. Verrill (rather, the narrator), stated the people were reduced in size while grouped about an altar of manabinite, which caused the transformation as the correct note was sounded upon the native whistle. When the normal persons gathered on that occasion, each one would have occupied about four square feet of space on the average. I am assuming that the day was in celebration of an event of dignity and importance and that they were not jammed together in a closely packed mob. We know the ground did not contract, and as the city they later built could have been surrounded by the eye of a large needle, the diminutive beings were separated from one another by vast distances and extremely rough country. Their wanderings before uniting would be a story in itself. And, too, the subjects of Queen Naliche must have been badly jostled on being enlarged! Did the doctor and the archeologist have gold crowns, fillings, bridgework or "store teeth"? Did the tiny ones wear rings, arm bands or neck ornaments? What effect would a passage through the prism have had upon a mollusc?

The name of A. Merritt is often mentioned in your discussion columns, but to date I have never read any of his stories in A. S. This is only because he has never been noticed. Both he and Mr. Verrill are my favorite authors in this line, though the latter's "Feathered Detective" appeared to be below average. Interplanetary travel and conquest are overworked themes, but the unique plots developed by Mr. Merritt and Mr. Verrill have my respect.

Speaking of the application of atomic energy, Dr. Tesla in SCIENCE AND INVENTION (April) mentioned his doubtful opinions.

Will it ever be possible to nullify gravity? The attraction of two bodies varies directly as the product of their masses and inversely as the square of the distance from the heavier to itself the lighter. Can this attraction have the same properties as magnetic force? I don't know, but it appears that it does not, so how can gravitation be overcome by electro-magnetic means?

Authors who write of other planets, with few exceptions, would have us believe only one race inhabits those worlds, speaking one language and having general customs. Think of the dialects, etc., on the face of Mother Earth and let the would-be cosmopolitan of this world envy his brothers in space!

As I have mentioned before, you cannot include me in your legion of regular readers: I have strong likes and dislikes for certain subjects and writers, but those that appeal to me are excellent.

Ralph Peterson,
1265 Eleventh Street,
Douglas, Arizona

(All we can say about "The Green Prism" is that it has been greatly admired by our readers. Mr. Verrill, who is one of the classic writers of the day, is certainly entitled to use his imagination to the fullest possible extent. We are glad to have you say that he is one of your favorite authors. As regards nullification of gravity, we are afraid to say that anything is impossible.—EDITOR.)

A LETTER OF SUGGESTIONS WHICH ARE HIGHLY APPRECIATED, BUT WE DO NOT SMOKE. (We speak of the male representative.)

Editor, AMAZING STORIES:

My real reason for writing this is to set up a hue and cry, and if necessary, start a siren for A. Merritt. Where is he? What is he spending all his time on? If it's another story like "The Moon Pool," fine. I couldn't ask for better. Now, Editor, since I wish to see AMAZING STORIES advanced, I heartily urge you to do the sensible thing and get in touch with A. Merritt. If he needs money to continue his work, advance him some, for if you took a vote of the readers of scientifiction the world over, I dare say you would receive a 100% vote in approval of A. Merritt's next novel or story, provided he writes one. Another thing: When A. Merritt writes a story, it isn't only a corking good yarn, it's a model and mark for the rank and file of writers to shoot at. No doubt you have a staff of excellent writers, but stack them up against A. Merritt for lucid thought, and you see how short they all fall. If Mr. Merritt reads this I would appreciate very much an answer as to why he hasn't written more lately. He really owes it to his most devoted public.

Why not try also to get hold of another old timer—E. R. Burroughs? He's writing for "Blue Book" and you ought to get him. His stories are really good, and different from the interesting but nevertheless common (?) run of scientifiction.

I was intensely gratified to see one of Paul's illustrations in your August issue. Try for more of him. Also try John Ruger, who illustrates for "Astounding Stories." Briggs' illustrations are too hazy, indefinite and objectless.

Your cover on the August issue is a wow. Wesso has as good a cover there as Paul ever drew. Tell him to keep at it. He lends spice to your stories.

"Skylark Three" looks as though it will surpass "Skylark of Space." Tell E. E. Smith, Ph.D., to keep up the good work. He's fine, and with more description, can in time, I believe, measure up to A. Merritt's wonderful standards.

"South Polar Beryllium" was good but P. Van Dresser doesn't put enough plot into it. His explanations and theories are good though. He works from a sound base.

"World Atavism" is better than the "Universe Wreckers," but encourage E. Hamilton to write more like "The Other Side of the Moon." That story dominated your whole quarterly.

"The Last War" was not quite as good as its forerunner, "The Red Peril," although it is a good story with a somewhat shallow plot.

Congratulations to Woods Peters. His "When Inca-Land Revolted" is good. He deals admirably with the principle in hand and develops such an astonishingly sound theory that we wonder why we didn't think of it ourselves. Keep up the good work, Woods.

Let's have more of the light but gripping short stories by A. L. Hodges. Mr. Hodges has done an exceedingly difficult thing back in "The Mystery of Professor Brown" and the two forerunners of it. He's written a complete and satisfying, to say nothing of scientific and gripping story, in about 500 words. Hats off to him. If I don't stop shortly, ye Editor will eject a disgusted snort, bite his cigar stub in two and leisurely tear this in two, and then in four.

W. Warren Williams,
5 West 63rd St.,
New York City.

(If you will count the stories, in two or three issues of our magazine and average them up, you will realize that five or six stories a month will not cover a big list of authors, and it is mathematically demonstrable that we cannot give stories by all the authors who are favorites with our readers. However, we are not feeling at all hopeless about getting another story from Merritt.

Paul is drawing for us and every now and then we try some new man, but we feel as if our work is very well placed with Wesso, Paul and Morey on our staff of artists.

"Skylark Three" has won a great deal of praise. In fact it has received much more appreciation than we had really hoped for. We are inclined to disagree with you about the "South Pole Beryllium." It impressed us as a capital story with lots of good science in it. Beryllium today is a very expensive metal. It is made from the mineral beryl and precious beryl is the emerald. It has quite interesting properties and bids fair to come into the market eventually.

It is as you say an exceedingly difficult thing to write a scientific and gripping story inside of 500 words. You will certainly get more stories in the future. And since we don't think we have reached a point of perfection, we can easily hold forth the promise to give even better stories in the future.—EDITOR.)

Written in the Year 2100

(*Continued from page 660*)

perceptible traces of a new combination of elements and to this new combination was given the blame. No one thought of asking why the make-up of the air should have changed so suddenly, and the world's two benefactors decided not to inform an unappreciative race that the whole Great Change was their handiwork.

Soon other changes were noticed. The ultra-violet rays, unimpeded by dust, got in their work of causing sunburn, and soon straw hats, farm style, became quite the vogue, but they were water-proofed to protect the top of the wearer's head during rain.

The rain caused many changes in the old order of life, for broadcasts of weather reports were listened for attentively and those who did venture out when rain was predicted wore rubber jackets and trousers of the same material, taking care that these garments fitted snugly at wrists, ankles and necks.

Clearly, the minds of the race reasoned, this policy of playing hide-and-seek with the weather should not continue; so it was recommended that children be clad as scantily as possible in summer weather to help immunize them to colds. Soon it was found that children's bodies became so healthy that the wearing of scanty clothes could safely be practiced in all but the severest weather. At the same time, the desired effect was achieved, in that the youngsters were absolutely unafraid of rain and wetness, for the discomfort was small in view of the fact that wetness brought no bad effects.

The grand-children of those who saw the Great Change grew up used to wearing nothing more at any time than a plain gown of white cloth much like the toga of the Romans, save that nothing was worn under it. In mild weather even the gowns were dispensed with in favor of a thin, loose garment whose ancestor was the humble B.V.D. of the twentieth century. Modesty, an essential to ugly bodies, had almost disappeared with ugliness itself. Bodies which had grown up exposed to the mysterious ultra-violet rays became animal-like in health, and strenuous exercise became so common that the new race was one of athletes.

Sickness? There was as little then as there is now. People had become too healthy for that.

Of Andrews and Scott little more is known than has been told, but it is to be hoped that they lived to realize what an immense amount of good they did for their race. It is most likely, however, that they were influenced more by the immediate calamities of their act than by the knowledge that in the end Man would benefit more than suffer. It is rather pitiful that they, with their warped minds, should have feared the world's opinion to the extent of concealing their responsibility for the Great Change until after their deaths.

Because of these two men, the world has become a happier place, for sickness and pain are almost gone and minds have kept pace with bodies in improvement. Clouds are gone from the mind quite as entirely as from the sky. No longer is our every thought directed toward comfort for the body, but rather toward a full, happy life—and we have been moderately successful in achieving it.

We are not yet come into our full inheritance, although some would have it so, for, since we have proved our superiority to environment by remolding it and in so doing re-creating ourselves, what more can we not do? Each adaptation to changed surroundings develops new qualities, and we are learning to control environment.

Our future as a race is now in our own hands.

THE END

CHEMISTRY

Complete, practical home-study courses prepared by some of the best-known chemists in this country, including ALLEN ROGERS, B.S., M.S., Ph.D.—Head of Department of Industrial Chemistry, Pratt Institute; L. M. TOLMAN, Ph.D., Vice-president, United Chemical and Organic Products Co.; BRADLEY STOUGHTON, B.S.—Head of the Department of Metallurgy, Lehigh University, and OWEN L. SHINN, Ph.D.—Professor of Applied Chemistry, University of Pennsylvania.

Mail Coupon for Free Booklet

INTERNATIONAL SCHOOL OF CHEMISTRY
Division of the
International Correspondence Schools
Box 7144-F, Scranton, Penna.

Without cost or obligation, please send me full details of your home-study course in

☐ Analytical Chemistry ☐ Metallurgical Chemistry
☐ Chemical Engineering ☐ Short Chemistry Course
☐ Industrial Chemistry ☐ Pharmacy

Name.....

Address.....

LEARN the BANJO at Home under HARRY RESER the World's Greatest Banjoist

The Famous Leader of the Widely Broadcasted

CLICQUOT CLUB ESKIMOS

offers an amazingly simple Banjo Course by mail which anyone can master at home in a few spare hours. Positions, fingering and chords thoroughly illustrated and explained. Students and Professionals heartily endorse this method. Costs only few cents a day. Special Banjos for Students.

BE POPULAR—MAKE MONEY

At home, parties, or week-end gatherings, the banjo player has many friends. Also, the banjo is essential in the dance orchestra of today. Banjoists make big money. Learn more about this inexpensive course and the opportunities in banjo playing.

Send for My FREE ILLUSTRATED BOOKLET

Harry Reser radio entertainer, phonograph artist, Tenor Banjo teacher, orchestra leader, composer of banjo music, guarantees success or money back.

HARRY RESER, Banjo Studio No. 32
148 West 46th Street, New York, N. Y.

Make big money AS A SALESMAN

Learn selling—fix your own hours—choose your own field—control your own income—be independent! As a salesman your income depends only on results. Many LaSalle-trained salesmen, in every section of the country, earn from $5,000 to $10,000 a year; many much more. A great number started without experience—doubled their incomes the first year. Train in your spare time by the LaSalle Problem Method, under the supervision of expert salesmen. Low cost; easy terms. 64-page booklet, "The Modern Salesman, Ambassador of Progress," free. Send for it today.

FREE

LaSalle Extension University, Dept. 1094-S, Chicago

$1260 to $3400 Year

Men—Women—18 UP
STEADY WORK
Paid Vacations
Common education usually sufficient
Mail Coupon Today— SURE

COUPON

Franklin Institute
Dept. N-117
Rochester, N. Y.

Gentlemen: Rush to me, FREE of charge, list of U.S. Government steady positions obtainable. Send FREE 32-page book describing salaries, hours, work, vacation and giving full particulars on how to get a position.

Name .....

Address .....

FREE

This Big Book of "POPULAR CARD TRICKS" with 6 months of AMAZING STORIES All for Only $1

Read This Account of the Most Interesting Evening We Ever Spent

UP till 9 o'clock the party was a complete flop. Nobody seemed to be able to get things going. Then Tom walked in. Tom's a live wire, if there ever was one.

He said he'd heard about a one man show anyone could perform with the help of a book he knew about. He had sent for that book, and said he was going to put on the show.

We thought he was joking, and laughed at him; but he sat us all down in the living-room, got out a pack of old playing cards, and started to do things that made our eyes pop out of our heads.

For over 2 hours he made those playing cards almost talk. Amazing predictions, mysteries, thought anticipations, invisible passages, etc.! What he could do with those cards just didn't seem human. After it was all over, the gang crowded around shaking his hand, and patting him on the back. The girls all said, "Oh, Tom! You're wonderful!" It was by far the most interesting evening I had ever spent.

We asked him how he learned it all, for we knew he didn't know a single thing about card tricks a short time before. For answer he said that he had discovered Walter Gibson's Famous Book of Popular Card Tricks and it had taught him every trick he had showed us.

And it was a fact! You, too, can entertain yourself and your friends with the 101 card tricks this marvelous book teaches. No slight of hand is necessary—no hard work to learn. Simply read the book carefully and you can do every trick in it.

Complete Book Yours FREE If You Act PROMPTLY!

Thousands have paid a good substantial sum for this big book of POPULAR CARD TRICKS, and have been more than repaid by countless evenings of delightful fun and entertainment. BUT—we want to send you your copy ENTIRELY FREE, prepaid! And at the same time enter your subscription for six big issues of AMAZING STORIES, $1.50 regular value, for only $1.00!

You get the Gift Volume of "POPULAR CARD TRICKS" ABSOLUTELY FREE, and AMAZING STORIES for two extra months virtually WITHOUT COST! But you must act at once—WHILE WE STILL HAVE BOOKS IN STOCK!

Simply Mail Coupon NOW!

AMAZING STORIES, Dept. 2J10,
381 Fourth Avenue, New York, N. Y.

Gentlemen: Send me, ENTIRELY FREE, prepaid, the complete big book of "POPULAR CARD TRICKS" by Walter Gibson; and enter my subscription for the next Six Big Issues of AMAZING STORIES at only $1, which I enclose. I understand you will promptly refund my $1 and I may keep the book if I am not more than satisfied.

Name .....

Address .....

City & State .....

RADIO WANTS MEN TRAINED AS R·T·I TRAINS THEM AT HOME for PRACTICAL WORK

Radio wants trained men and pays them well. This great industry would rather pay Big Money to men trained as R. T. I. trains them, than low wages to untrained "tinkers" and "guessers." Trained radio men can easily make $40 to $50 per week and upwards. With training and experience many make $75 to $100 per week and are always in demand. Get the inside facts from leading radio men in the free "R. T. I. Radio Opportunity Book."

BETTER JOBS—BIGGER PAY

R. T. I. offers you the way to get into Radio *right*, and the definite path to the *Better Jobs* and *Bigger Pay*. You need no experience to start. You can quickly make $10 to $20 per week Extra Money in spare time while learning.

APPROVED TRAINING

R. T. I. training is endorsed by leading Radio Concerns and Radio Trade Associations. It is prepared and supervised by well known men in different branches of radio. You will find it interesting, practical, thorough and easy to understand.

LEARN AT HOME

Why? Because the fellow who trains at home the R. T. I. way learns rapidly and makes a most valuable man. R. T. I. gives you the training the radio industry wants you to have for important, well-paid work.

Make your success certain. Start R. T. I. training in radio now. Go on up in this great money-making industry that is becoming part of all our daily life. Entertainment, Education, Business, Transportation, News—all depend more and more upon radio.

GET PAID FOR WHAT YOU KNOW

Be a trained man. R. T. I. gives you money-making radio training and keeps you up-to-the-minute with its service. No more worry about jobs when you complete R. T. I. training.

TELEVISION

This amazing new branch of radio is part of the R. T. I. training. (No extra charge.) Be prepared for this new work—Television Service-men will soon be in demand.

TALKING PICTURES

Require trained men—in the studios—the theatres—for servicing and installing the apparatus, and R. T. I. training covers this, too. Broadcasting Stations; Airplane Radio Apparatus; Sea-going Ship Radio Operating; Radio factories; Selling; Repairing, etc. All these opportunities are included in R. T. I. training.

Free Opportunity Book

Get the facts about the opportunities in Radio, Television and Talking Pictures in this wonderful book—it is free.

Mail Coupon for Big FREE BOOK

Let F. H. SCHNELL and the R. T. I. Advisory Board Help You

20 years' Radio Experience. First to establish 2-way amateur communication with Europe. Former Traffic Mgr. of Am. Radio Relay League, Lieut. Com. U. S. N. R. Inventor and Designer. Cons. Radio engineer.

Assisting him is the R. T. I. Advisory Board, composed of men prominent in the Radio Industry—manufacturing, broadcasting, engineering and servicing. All these men know Radio and will help you succeed in their field.

RADIO & TELEVISION INSTITUTE
4806 St. Anthony Ct., Chicago, Dept. '787

THE R. T. I. ADVISORY BOARD. These men are executives with important concerns in the radio industry—manufacturing, sales service, broadcasting, engineering, etc., etc. They supervise R. T. I. Work Sheets, Job Tickets, and other training methods.

RADIO & TELEVISION INSTITUTE
4806 St. Anthony Court, Chicago, Dept 787

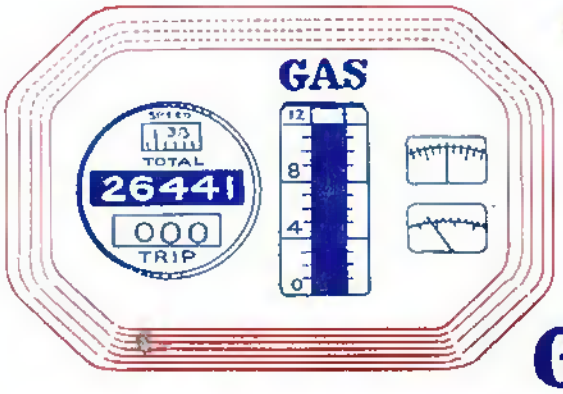
Send me Free and prepaid your BIG RADIO OPPORTUNITY BOOK, "Tune In On Big Pay," and full details of your three-in-one Home Training (without obligating me in any way).

Name.....

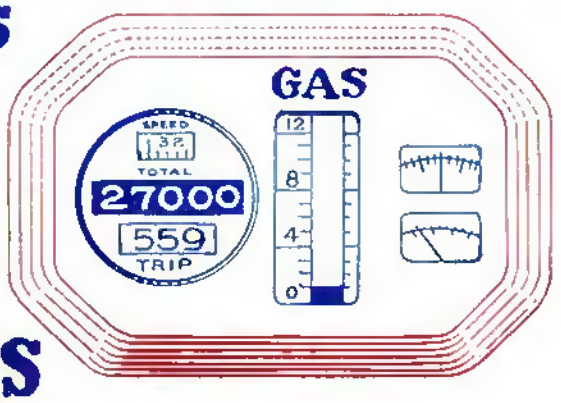
Address.....

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

Over the Mountains from Los Angeles



559 Miles on 11 Gallons of GAS



Think of it! FIVE HUNDRED FIFTY-NINE MILES over rough mountainous country burning only ELEVEN GALLONS OF GASOLINE. Imagine more than FIFTY MILES to the GALLON. This is what the WHIRLWIND CARBURETING DEVICE does for D. R. Gilbert, enough of a saving on just one trip to more than pay the cost of the Whirlwind.

THE WHIRLWIND SAVES MOTORISTS MILLIONS OF DOLLARS YEARLY

Whirlwind users, reporting the results of their tests, are amazed at the results they are getting. Letters keep streaming into the office telling of mileages all the way from 22 to 59 miles on a gallon, resulting in a saving of from 25 to 50% in gas bills alone.

Mark H. Estes writes: "I was making 17 miles to the gallon on my Pontiac Coupe. Today, with the Whirlwind, I am making 35 5/10 miles to the gallon. Am I glad I put it on? I'll say so!"

P. P. Goerzen writes: "I made an actual test both with and without a Whirlwind, getting 13¼ miles without and 34 6/10 miles with the Whirlwind, or a gain of 21 miles to the gallon. The longer the Whirlwind is in use on the machine, the better the engine runs, has more pep and quicker starting. It makes a new engine out of an old one, and starts at the touch of the starter button."

R. J. Tulp: "The Whirlwind increased the mileage on our Ford truck from 12 to 26 miles to gallon and 25% in speed. We placed another on a Willy's Knight, and increased from 12 to 17 miles per gallon.

Arthur Grant: "I have an Oakland touring car that has been giving me 15 miles to the gallon average, but I can see a great difference with the Whirlwind, as it climbs the big hills on high and gives me better than 23 miles to the gallon of gas, which is better than 50% saving in gas."

W. A. Scott: "I had my Whirlwind for three years. Winter and summer it gives the same perfect service, instant starting, smoother running, and what I saved in gasoline these last few years has brought other luxuries which I could not have afforded previously."

Car owners all over the world are saving money every day with the Whirlwind, besides having better operating motors. Think what this means on your own car. Figure up your savings—enough for a radio—a bank account—added pleasures. Why let the Oil Companies profit by your waste. Find out about this amazing little device that will pay for itself every few weeks in gas saving alone.

FITS ALL CARS

In just a few minutes the Whirlwind can be installed on any make of car, truck, or tractor. It's actually less work than changing your oil, or putting water in the battery. No drilling, tapping or changes of any kind necessary. It is guaranteed to work perfectly on any make of car, truck or tractor, large or small, new model or old model. The more you drive the more you will save.

SALESMEN AND DISTRIBUTORS WANTED

Free Sample and $100.00 a Week Offer

Whirlwind men are making big profits supplying this fast-selling device that car owners cannot afford to be without. Good territory is still open. Free sample offer and full particulars sent on request. Just check the coupon.

WHIRLWIND MANUFACTURING CO.
999-230-A Third Street Milwaukee, Wisc.

GUARANTEE

No matter what kind of a car you have—no matter how big a gas eater it is—the Whirlwind will save you money. We absolutely guarantee that the Whirlwind will more than save its cost in gasoline alone within thirty days, or the trial will cost you nothing. We invite you to test it at our risk and expense. You are to be the sole judge.

FREE TRIAL COUPON

WHIRLWIND MANUFACTURING CO.
999-230-A Third Street, Milwaukee, Wisc.

Gentlemen: You may send me full particulars of your Whirlwind Carbureting device and free trial offer. This does not obligate me in any way whatever.

Name .....

Address .....

City .....

County ..... State .....

☐ Check here if you are interested in full or part time salesmen position.